OnCommand Insight™ (OCI) 7.3.x Report Catalog for Business Analytics

Release 5

Services Product Management

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Introduction

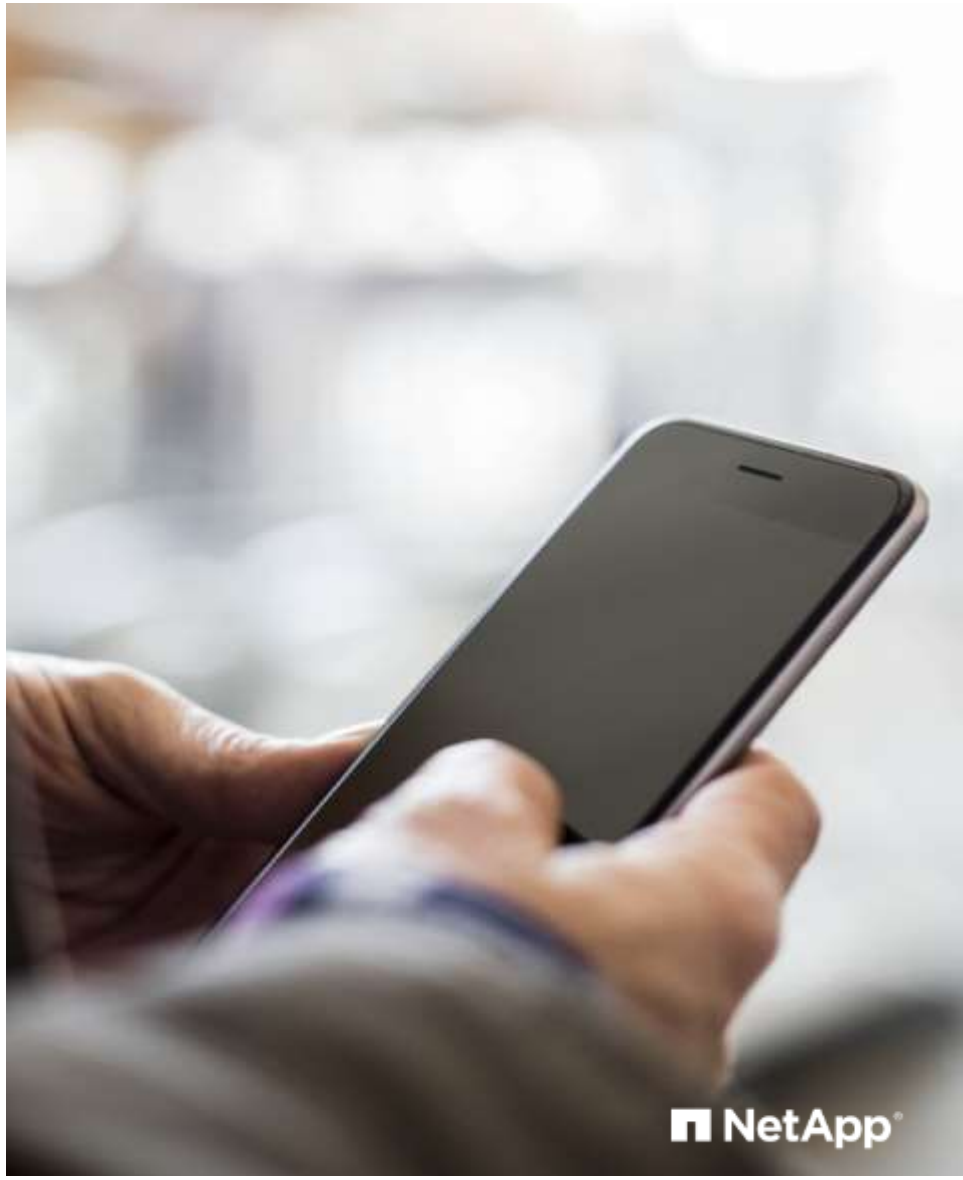
The **OnCommand Insight™ 7.3.x Report Catalog for Business Analytics** provides a catalog of storage business intelligence reporting available for delivery by NetApp Professional Services to customers using NetApp® OnCommand® Insight software.

How to Use this Catalog

1. Click on the tab bar above to navigate and view available reports and dashboards.
2. Keep track of your favorites by checking the box next to a report: ☑ **Select This Report**
3. View the "**List of All Reports**" to browse the entire collection or to review the reports you selected.
4. Contact your NetApp sales representative for more information or to schedule delivery by NetApp Professional Services.

Note: The guidance provided in this catalog is based on the combined experiences of NetApp Professional Services, NetApp Pre-Sales Engineers, and Global Support Center personnel who work with OCI on a daily basis.

These reports are targeted for OCI version 7.3.x.



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Common Report Definitions – Capacity

Field	Description
Raw Capacity TB	Pre-RAID Raw Capacity in TB of all disks as reported by the storage device monitored by OCI and contained in the Storage and Storage Pool Capacity Fact table.
Capacity TB	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Used Capacity TB	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated. If Space Guarantee is Enabled, then Used = Allocated.
Max Supported IOpS	IOpS Capability of the Storage Pool as published by the disk drive manufacturer. Example: a 15K SAS drive theoretically supports 200 IOpS.
Provisioned TB	Capacity in TB provisioned to host initiators (HBAs) regardless of protocols. Can be a combination of Volume Allocated Capacity and Internal Volume Allocated Capacity.
Allocated TB	Same as provisioned.
Volume Allocated TB	SAN based capacity that is carved from a storage pool or RAID group and available for provisioning. Volume Allocated does not necessarily mean the capacity is mapped and masked in the fabric.
Internal Volume Allocated TB	Data or Total Allocated internal (Flexvol) volume capacity. Data refers to allocated capacity NOT including snapshots.
Orphaned Capacity TB	This is volume allocated capacity that is NOT mapped or masked, mapped but not masked, or mapped, masked and not zoned…or the volume does not have an active path to a host.
Projected Usable Capacity TB	Usable Capacity in TB for the future 12 month period. Usable capacity will not be projected per se. This field is the basis for the intercept as a result of linear regression and projected used capacity. The field is contained in the Storage and Storage Pools Capacity Fact table.
Projected Used Capacity TB	Forecast Used Capacity in TB for the future 12 month period. This field is based on standard linear regression which is embedded within the DWH ETL process and contained in the Storage and Storage Pools Capacity Fact table.

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Common Report Definitions – Performance

Field	Description
Write IOpS	Measures the number of I/O WRITE service requests on the volume during the selected time period (measured in I/O per sec).
Read IOpS	Measures the number of I/O READ service requests on the volume during the selected time period (measured in I/O per sec).
Write Throughput	The Rate at which data is being WRITTEN in a fixed amount of time in response to I/O service requests (measured in MB per sec).
Read Throughput	The Rate at which data is being READ in a fixed amount of time in response to I/O service requests (measured in MB per sec).
Read Latency	The time it takes from the moment a READ request for information arrives at the storage device to the time when the storage device begins to send the information back in response. This is the actual latency of the device in milliseconds.
Write Latency	The time it takes from the moment a WRITE request for information arrives at the storage device to the time when the storage device begins to send the information back in response. This is the actual latency of the device in milliseconds.
Total IOpS	Measures the total number of I/O service requests on the volume during the selected time period (measured in I/O per sec). Consists of front-end protocol IOpS (NFS, CIFS, FC, iSCSI) for NetApp nodes.
Peak IOpS	Measures the maximum I/O service requests on the volume during the selected time period (measured in I/O per sec).
Total MB/s	The Rate at which data is being transmitted in a fixed amount of time in response to I/O service requests (measured in MB per sec).
Peak MB/s	Maximum rate that data is being transmitted in a fixed amount of time in response to I/O service requests (measured in MB per sec).

Field	Description
Avg Latency	The time it takes from the moment a request for information arrives at the storage device to the time when the storage device begin to send the information back in response. This is the actual latency of the device in milliseconds.
Peak Latency	The maximum time it takes from the moment a request for information arrives at the storage device to the time when the storage device begins to send the information back in response. This is the actual latency of the device in milliseconds.
Node Utilization	Node CPU Utilization shows the percentage of time that one or more CPUs were busy. In OCI, this is based on the higher of CPU, WAFL_EX and Kahuna Processor Domain metrics. Details are as follows: • System – avg_processor_busy, cpu_elapsed_time1 • WAFL – total_cp_msecs, cp_phase_times.P2_FLUSH • Processor – domain_busy, processor_elapsed_time Overall node utilization then is displayed as the higher of the 3 (system, WAFL or processor domains) which all indicate a controllers ability (utilization) to process read/write requests. For EMC Symmetrix Arrays, this metric is FA Port Utilization.
Disk Utilization	The percentage % of post-cache service time used for requests out of the available sample time. This metric indicates what portion of the time the disk is busy servicing requests.
Disk IOpS	Measures the total number of I/O service requests on the disk for the virtual volume during the time presented period (measured in I/Os per second)
95th Percentile	The 95th percentile says that 95% of the time, the usage is at or below this amount. Conversely, 5% of the samples may be bursting above this rate but are ignored.

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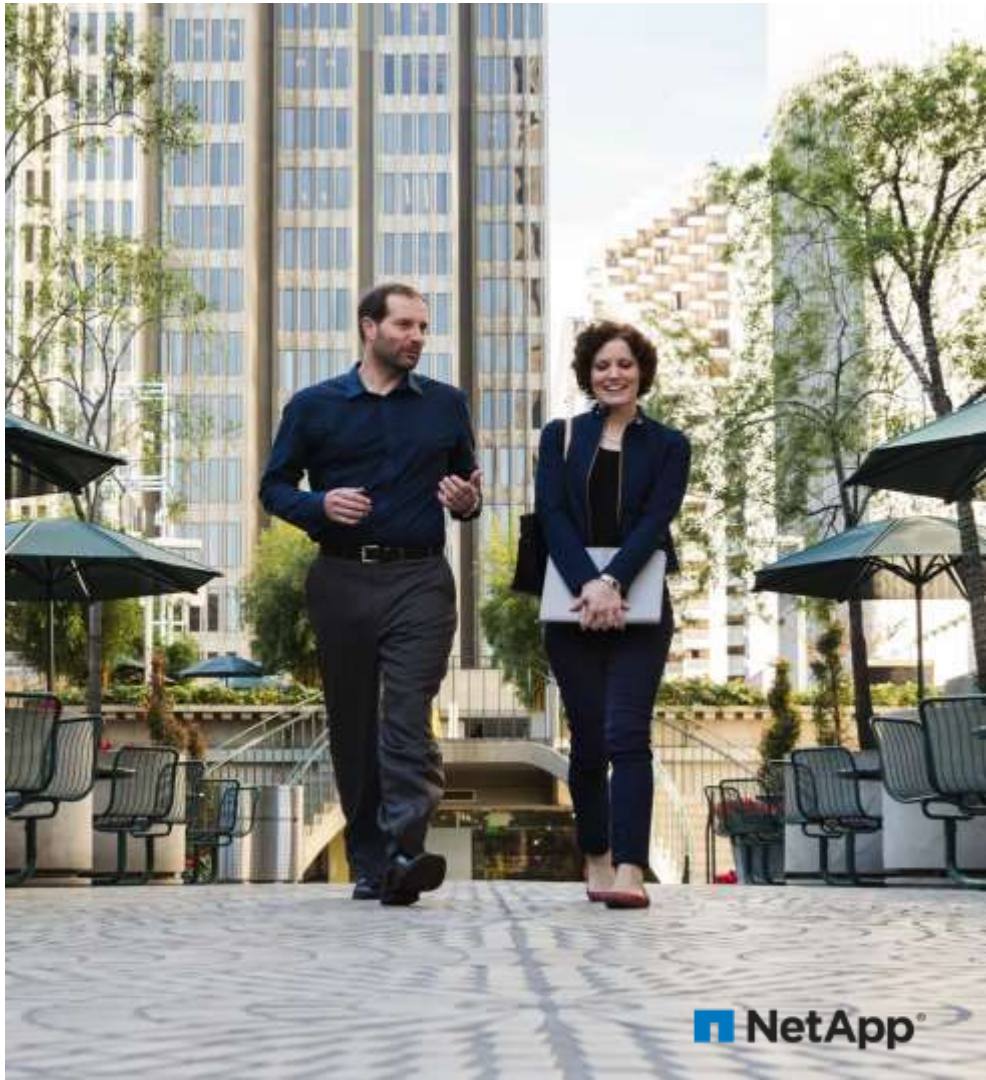
Capacity Management Overview

Here are some of the day-to-day capacity management tasks that are augmented by using the wide variety of capacity reports in this catalog:

- Manage and optimize storage
- Manage tiering
- Manage storage sizing
- Analyze service level objectives for capacity
- Forecast capacity utilization
- Identify, recover, and resolve orphaned storage
- Manage under-utilized and over-utilized storage
- Manage capacity thresholds for thin provisioning and alerts

* Any modifications to the Data Dictionary for the reports shown will require a custom report.



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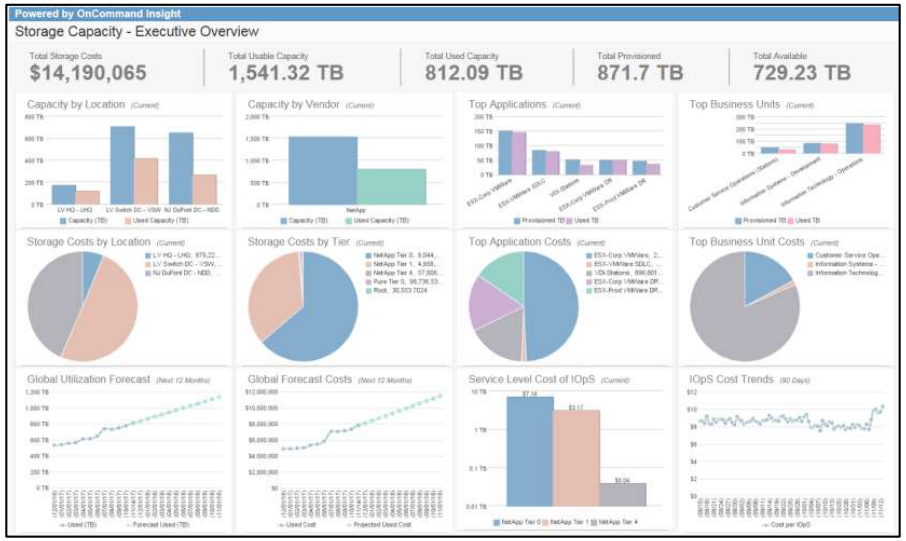
2.1 Storage Capacity – Executive Overview

Description: This dashboard shows Global Capacity (Usable, Used, Allocated and Available) as well as overall existing Capacity broken down by location, vendor, provisioned capacity by Application, and provisioned capacity by Business Unit. Additionally, it shows Total Cost of Storage and Average Cost of IOpS as well as overall existing Capacity broken down by location, Service Level/Tier, top cost by Application, and top cost by Business Unit capacity.

Prerequisites: Annotations/definitions are necessary for costs, Application, Business Unit, and Service Level/Tier. Requires secondary ETL script to run nightly. There is a Non-2nd ETL version as well. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Internal Volume	The NetApp Internal Volume or Flexvol associated with the aggregate and storage device monitored by OCI.
Compound Average Growth Rate (CAGR)	Function build into the SQL query to derive Growth Rate for future capacity projection.
	ROUND(power(EndUsed / BeginUsed, 1/TIMESTAMPDIFF(MONTH,beginDate,endDate))-1,2)
EndUsed	Internal Volume Current Used Capacity as reported by the Internal Volume Capacity Fact table in the DWH and as-of the last successful ETL Build.
BeginUsed	Internal Volume Used Capacity as reported by the Internal Volume Capacity Fact table 365 days ago.
Date	Full date field available in the DWH Date Dimension table.
UsedGB	Used capacity in GB as reported by the Internal Volume and contained in the Internal Volume Capacity Fact table.
Projected Used GB	Projected Used Capacity (TB) for future 6 month period. Based on a Compound Average Growth Rate (CAGR) power function (see above) in MySQL.

Click on the report screen shot above to view an enlarged image.

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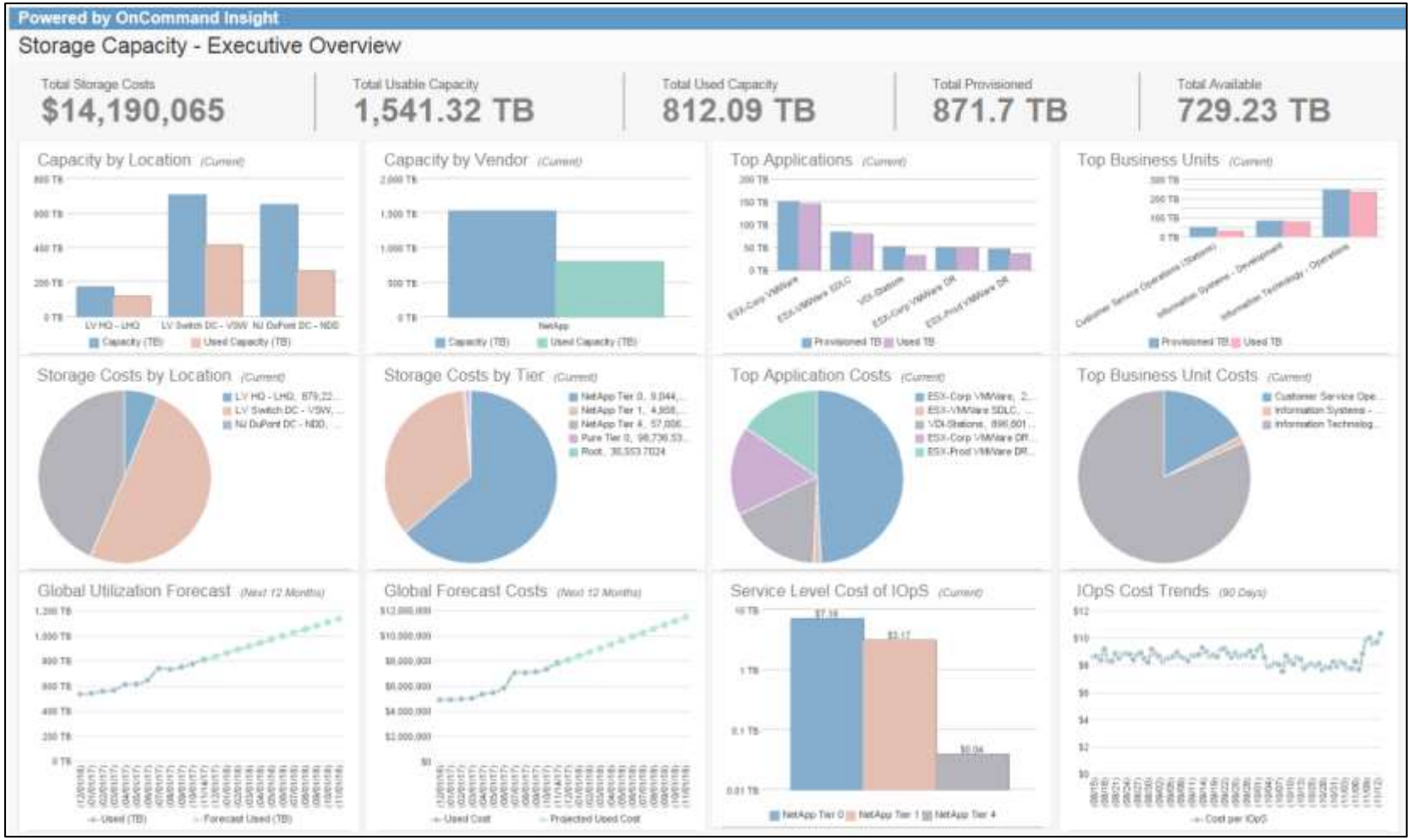
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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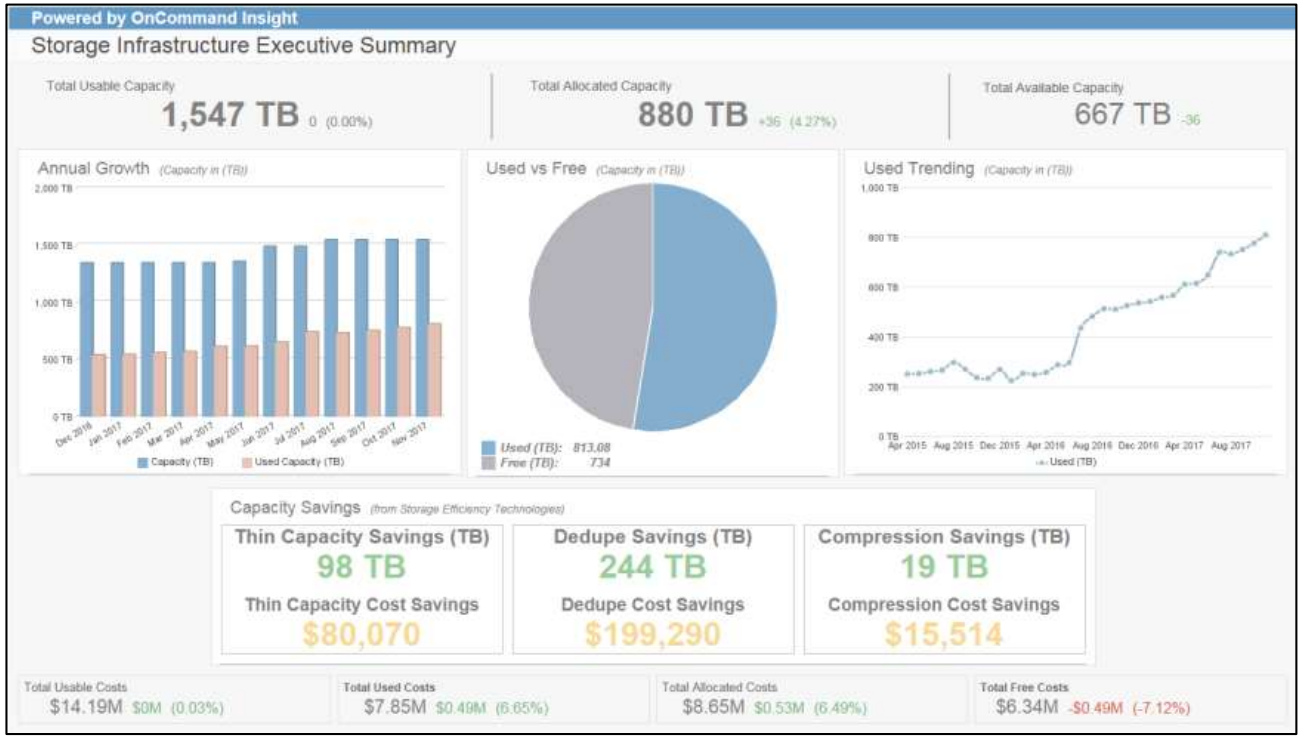
2.2 Storage Infrastructure – Executive Summary (Page 1 of 2)

Description: This dashboard, designed for C-Level/Executive consumption, shows overall global capacity metrics, cost of storage summary and cost and capacity savings from the deployment of storage efficiency technologies.

Prerequisites: Annotations/definitions are necessary for costs, and Service Level/Tier. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover and Plan.



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Data Dictionary

See next page

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2.2 Storage Infrastructure Executive Summary (Page 2 of 2)

Field	Description
Total Usable Capacity TB	Post-RAID capacity allocated to the storage pool and available for use
Total Allocated Capacity TB	Capacity provisioned to hosts
Total Available Capacity TB	Total Usable Capacity (TB) - Total Allocated Capacity (TB)
Capacity TB	Same as Total Usable Capacity (TB)
Used Capacity TB	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned then Used = Allocated.
Used (TB)	Same as Used Capacity (TB)
Free (TB)	Capacity (TB) - Used Capacity (TB)
Date	Full date field available in the DWH Date Dimension table
Cost	OCI configured annotation. Defines cost per GB per storage tier or Service Level.
Thin Capacity Savings (TB)	Thin Savings (TB) is Over-Subscribed Capacity e.g. capacity that is over 100% allocated derived from (Allocated / Usable) – 100 * Usable. This provides the amount of capacity we would have to purchase if NOT using thin provisioning technology.
Thin Capacity Cost Savings	Thin Cost Savings is the actual dollar amount, derived from the COST annotation * Thin Savings (GB) This shows the amount of money you are saving by using Thin Provisioning Technology.
Dedupe Savings (TB)	Dedupe Savings (TB) is NetApp Flexvol Used Capacity (1 minus the NetApp Flexvol dedupe ratio) divided by the NetApp Flexvol dedupe Ratio). This shows the amount of capacity you would have to purchase IF NOT using deduplication technology.

Data Dictionary

☐ **Select This Report**

Field	Description
Dedupe Cost Savings	Dedupe Cost Savings is the actual dollar amount, derived from the COST annotation * Dedupe Savings (GB) This shows the amount of money you are saving by using deduplication technology.
Compression Savings (TB)	Compression Savings (TB) is NetApp Flexvol Used Capacity * (1 minus the NetApp Flexvol compressionRatio) divided by the NetApp Flexvol compressionRatio). This shows the amount of capacity you would have to purchase IF NOT using compression technology.
Compression Cost Savings	Compression Cost Savings is the actual dollar amount, derived from the COST annotation * Compression Savings (GB) This shows the amount of money you are saving by using compression technology.
Total Usable Costs	Usable Costs is the actual cost of the Usable Capacity, derived from the COST annotation * Usable Capacity (GB)
Total Used Costs	Used Costs is the actual cost of the Used Capacity, derived from the COST annotation * Usef Capacity (GB)
Total Allocated Costs	Allocated Costs is the actual cost of all Thick and Thin Allocated Capacaity, derived from the COST annotation * Allocated (GB)
Total Free Costs	Free Costs is the actual cost of all Free Capacity, derived from the COST annotation * Free (GB)

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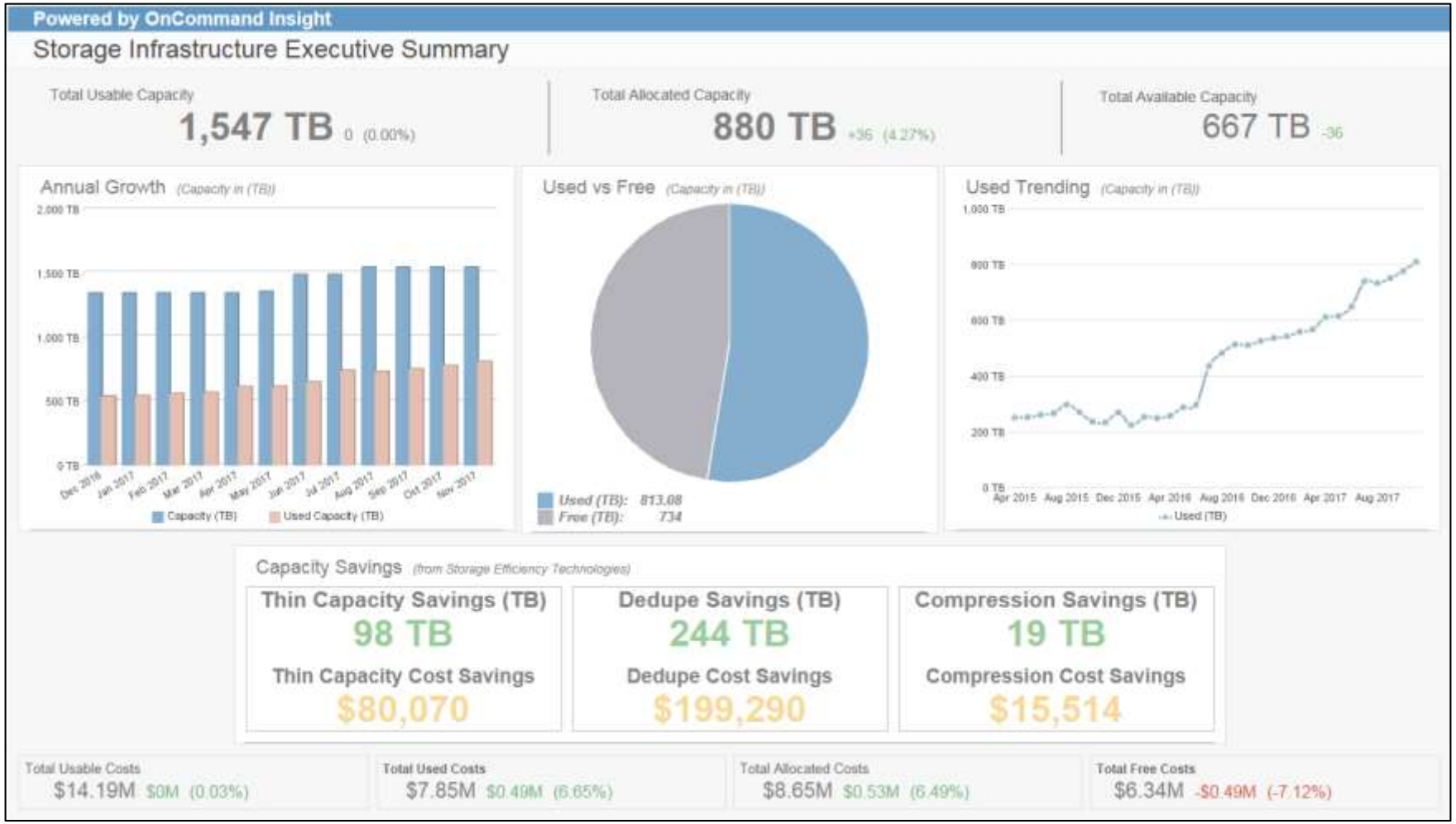
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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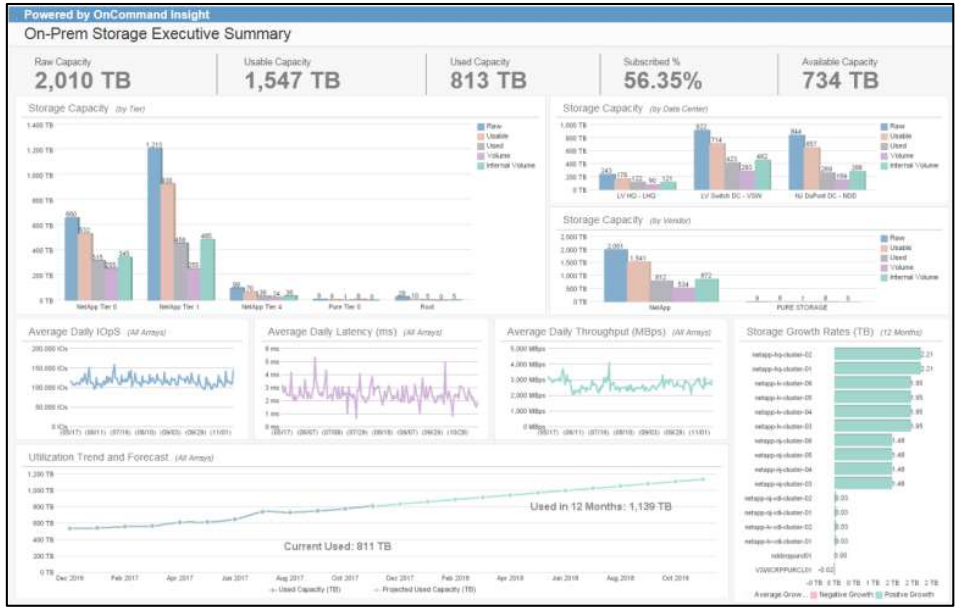
2.3 On-Prem Storage – Executive Summary

Description: This dashboard shows On-Premises physical storage capacity distributed by tier, location and vendor. Global performance metrics show Sum of Average IOpS, Average Latency, and Throughput. Storage growth rates and capacity utilization forecasting (using linear regression) are also included.

Prerequisites: Annotations/definitions are necessary for Data Center and tier or service level. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Tier	OCI configured annotation. Defines tiers of storage or Service Levels based on disk type, disk speed, or IOpS/TB.
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Vendor	Name of the vendor associated with the storage device monitored by OCI.
Storage Name	Name of the storage device monitored by OCI.
Raw Capacity (TB)	Pre-RAID raw capacity in TB as reported by the Storage Array monitored by OCI.
Usable Capacity (TB)	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Used Capacity (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned then Used = Allocated.
Total Provisioned (TB)	Volume or Flexvol based capacity that is allocated to host initiators.
Subscribed %	Capacity that is subscribed to host using thin provisioning technology. This is Total Provisioned divided by Usable Capacity.
Available Capacity (TB	Usable Capacity (TB) – Used Capacity (TB)
Volume	Volume (SAN/LUN) allocated capacity in (TB)
Internal Volume	Flexvol (NAS) allocated capacity in (TB)
Sum of Average Daily IOpS	Sum of the Average Daily IOpS collected over a period of 180 days.
Average Daily Latency	Average Daily Latency in milliseconds collected over a period of 180 days.
Sum of Average Daily MBps	Sum of the Average Throughput in MB/sec collected over a period of 180 days.
Current Used (TB)	Current Used Capacity (TB) as of the last OCI collection interval and DWH ETL Build.
Beginning Used (TB)	Used Capacity (TB) collected by OCI 365 days ago.
Growth Rate	Simple growth formula taking Current Used (TB) – Beginning Used (TB) / 12 months.
Projected Used Capacity (TB)	Projected Used Capacity (TB) for future 12 month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.

 Click on the report screen shot above to view an enlarged image.

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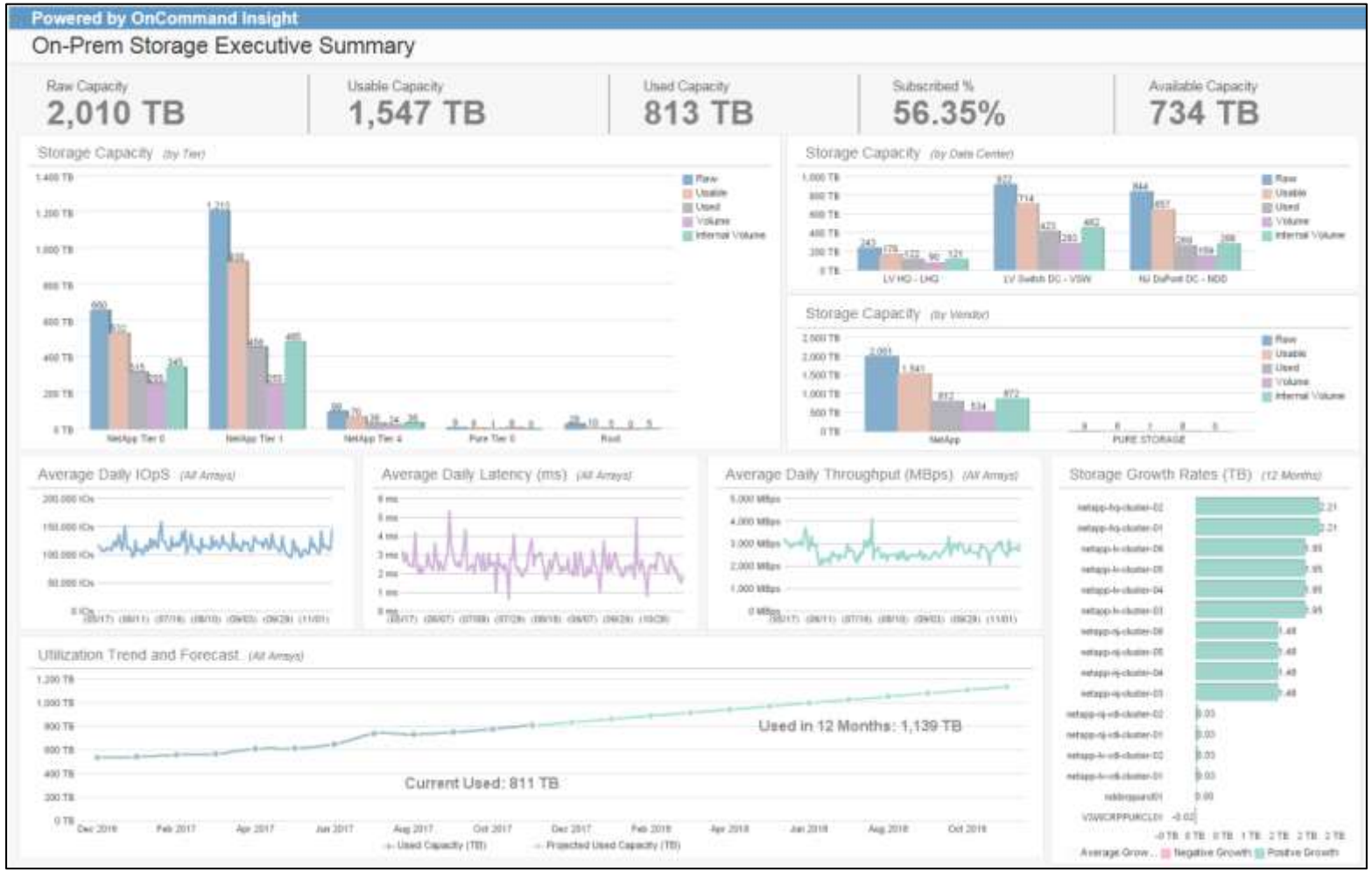
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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2.4 Capacity Forecast and Trends

Description: This report will show capacity trends and forecast for multi-vendor storage devices. The report uses linear regression to project capacity utilization 12 months into the future. Current capacity metrics and growth rates are included.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the storage device monitored by OCI.
Date	Fulldate field available in the DWH Date Dimension table.
Total Usable Capacity (TB)	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Total Used Capacity (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned then Used = Allocated.
Total Provisioned Capacity (TB)	Volume or Flexvol based capacity that is allocated to host initiators.
Total Available (TB)	Total Usable Capacity (TB) - Total Used Capacity (TB)
Current Used	Current Used Capacity (TB) as of the last OCI collection interval and DWH ETL Build.
Used in 12 Months	Projected Used Capacity in 12 months' time based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Monthly Growth Rate	Simple growth formula taking Used in 12 Months (TB) – Current Used (TB) / 12 months
Usable (TB)	Same as Total Usable Capacity (TB)
Used (TB)	Same as Used Capacity (TB)
Forecast Usable (TB)	Projected Usable Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Forecast Used (TB)	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.

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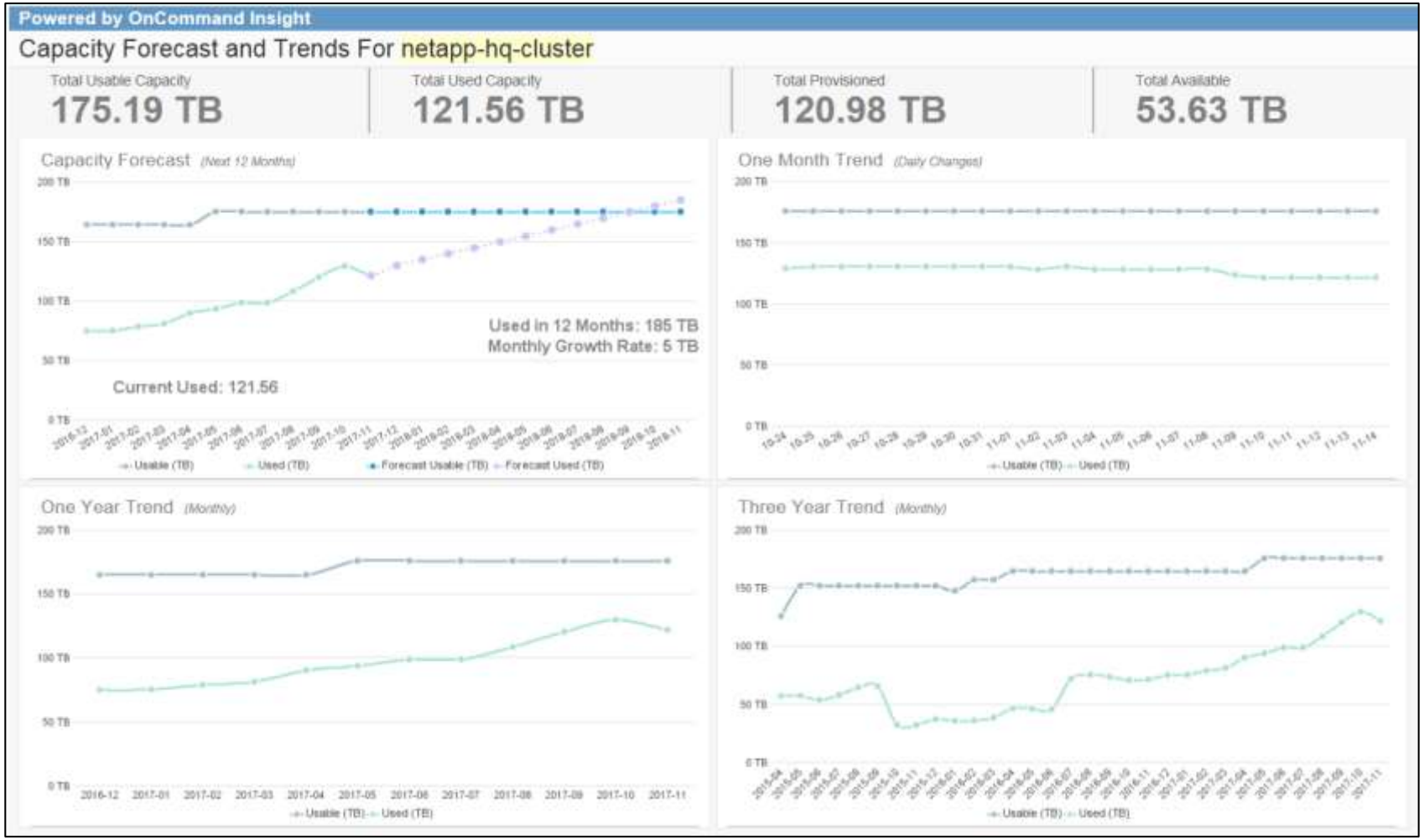
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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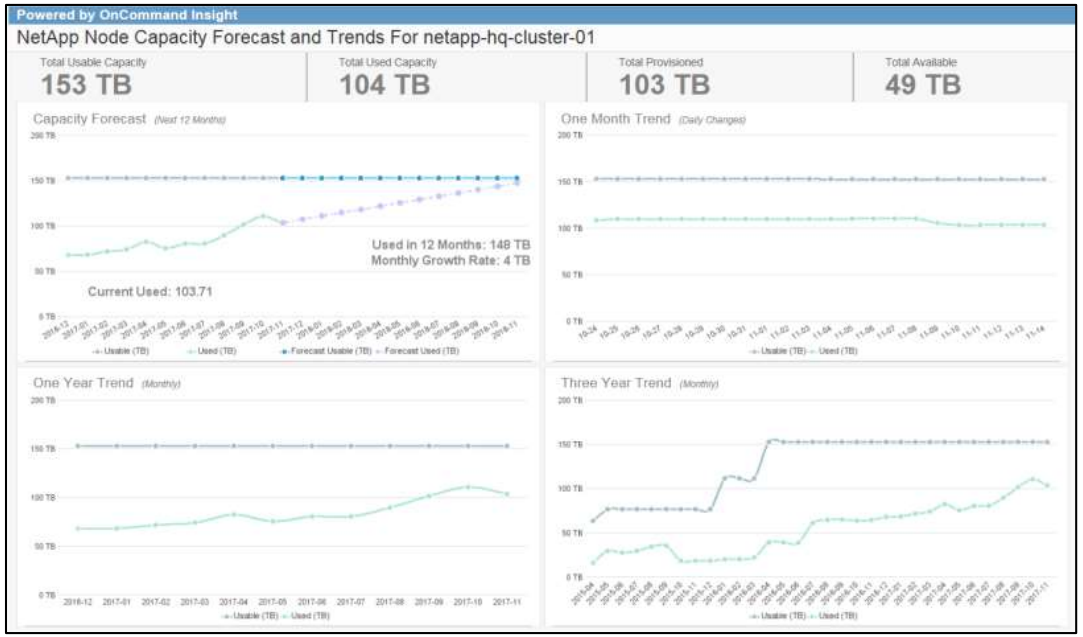
2.5 NetApp Node Capacity Forecast and Trends

Description: This report will show capacity trends and forecast for NetApp Node storage devices. The report uses linear regression to project capacity utilization 12 months into the future. Current capacity metrics and growth rates are included.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Node	CDOT Cluster Node name or HA Pair partner as monitored by OCI.
Date	Fulldate field available in the DWH Date Dimension table.
Total Usable Capacity (TB)	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Total Used Capacity (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Total Provisioned Capacity (TB)	Volume or Flexvol based capacity that is allocated to host initiators.
Total Available (TB)	Total Usable Capacity (TB) - Total Used Capacity (TB)
Current Used	Current Used Capacity (TB) as of the last OCI collection interval and DWH ETL Build.
Used in 12 Months	Projected Used Capacity in 12 months' time based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Monthly Growth Rate	Simple growth formula taking Used in 12 Months (TB) – Current Used (TB) / 12 months.
Usable (TB)	Same as Total Usable Capacity (TB).
Used (TB)	Same as Used Capacity (TB).
Forecast Usable (TB)	Projected Usable Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Forecast Used (TB)	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.

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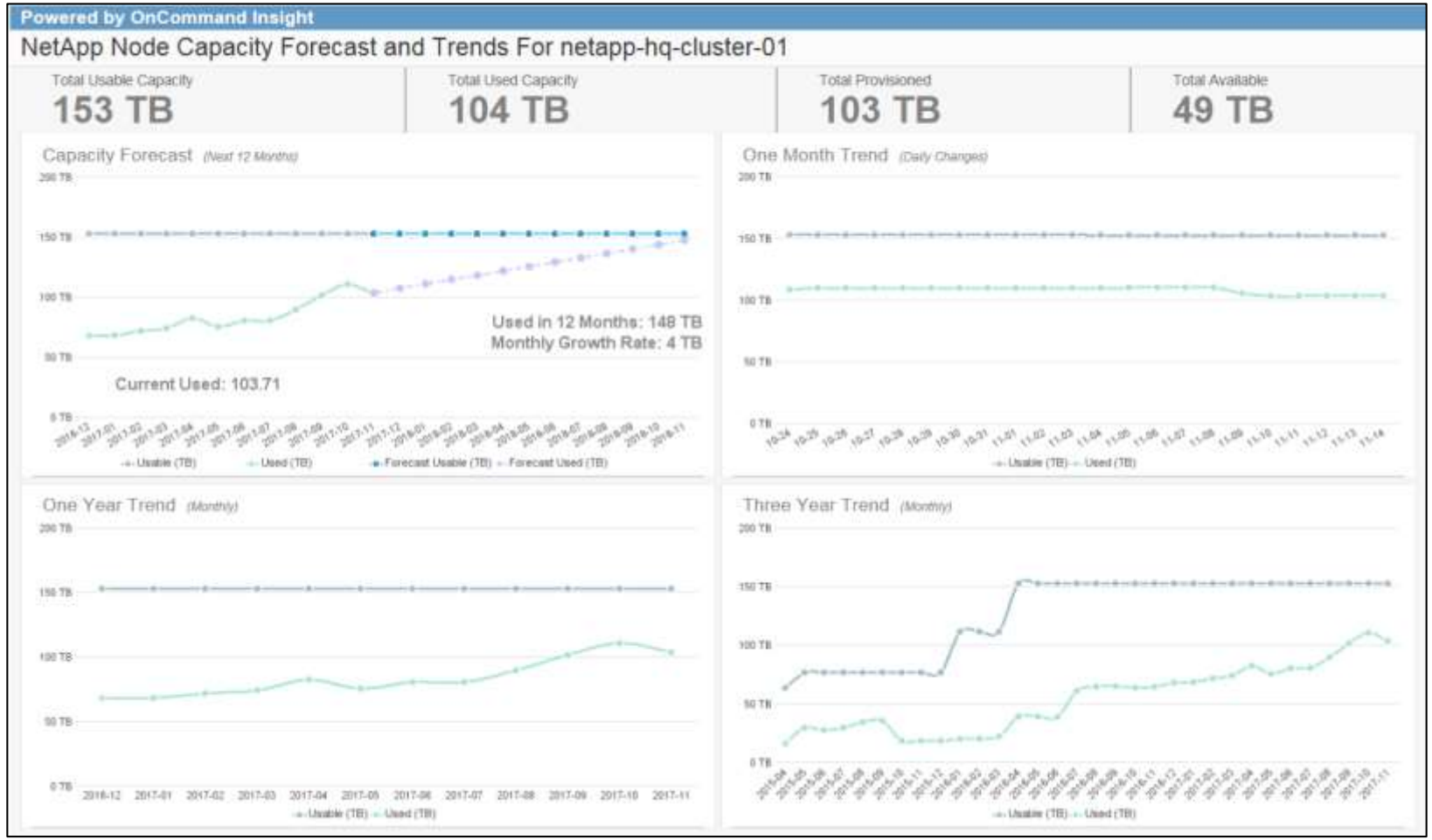
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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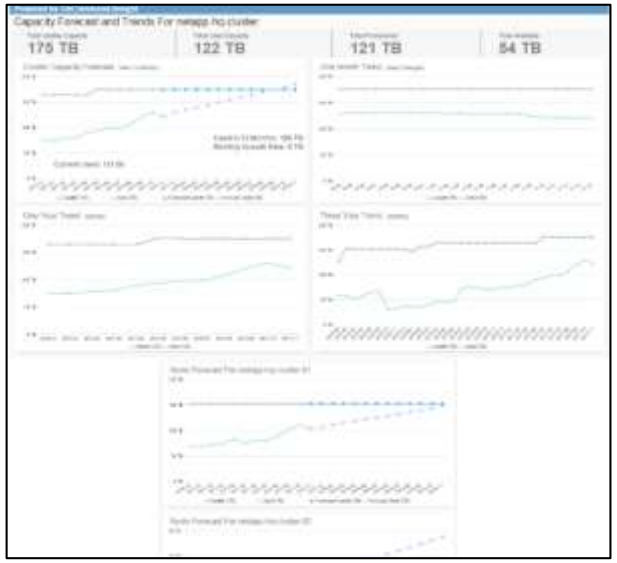
2.5 NetApp Node Capacity Forecast and Trends – All Clusters with Nodes

Description: This report will show capacity trends and forecast for NetApp Node storage devices grouped by Cluster including all nodes associated with that cluster. The report uses linear regression to project capacity utilization 12 months into the future. Current capacity metrics and growth rates are included. Each cluster and associated nodes will be displayed on separate report pages. It is recommended to use PDF as an output format.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	CDOT Cluster or 7-Mode HA Pair name as monitored by OCI.
Storage Node	CDOT Cluster Node name or HA Pair partner as monitored by OCI.
Date	Fulldate field available in the DWH Date Dimension table.
Total Usable Capacity (TB)	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Total Used Capacity (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Total Provisioned Capacity (TB)	Volume or Flexvol based capacity that is allocated to host initiators.
Total Available (TB)	Total Usable Capacity (TB) - Total Used Capacity (TB)
Current Used	Current Used Capacity (TB) as of the last OCI collection interval and DWH ETL Build.
Used in 12 Months	Projected Used Capacity in 12 months' time based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Monthly Growth Rate	Simple growth formula taking: Used in 12 Months (TB) – Current Used (TB) / 12 months
Usable (TB)	Same as Total Usable Capacity (TB)
Used (TB)	Same as Used Capacity (TB)
Forecast Usable (TB)	Projected Usable Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Forecast Used (TB)	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.

 Click on the report screen shot above to view an enlarged image.

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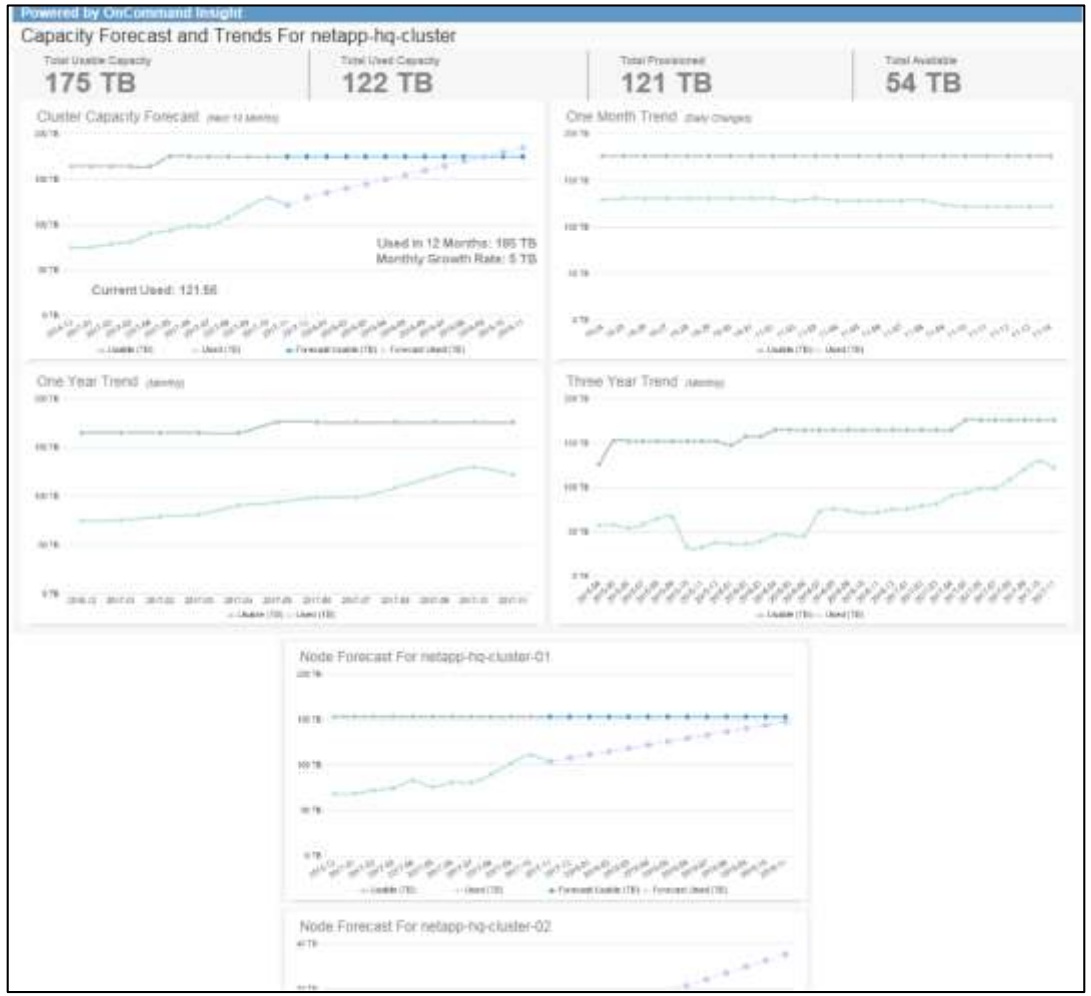
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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2.6 Storage Pool Forecast and Trends

Description: This report will show capacity trends and forecast for multi-vendor storage devices and their associated storage pools. The report uses linear regression to project capacity utilization 12 months into the future. Trends include 7 days, 30 days, 1 year and 3 years.

Prerequisites: Required licenses for OCI are Discover and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the storage device monitored by OCI.
Storage Pool Name	Name of the storage pool or aggregate associated with the storage device monitored by OCI.
Date	Fulldate field available in the DWH Date Dimension table.
Used (TB)	Same as Used Capacity (TB).
Forecast Used (TB)	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.

 Click on the report screen shot above to view an enlarged image.

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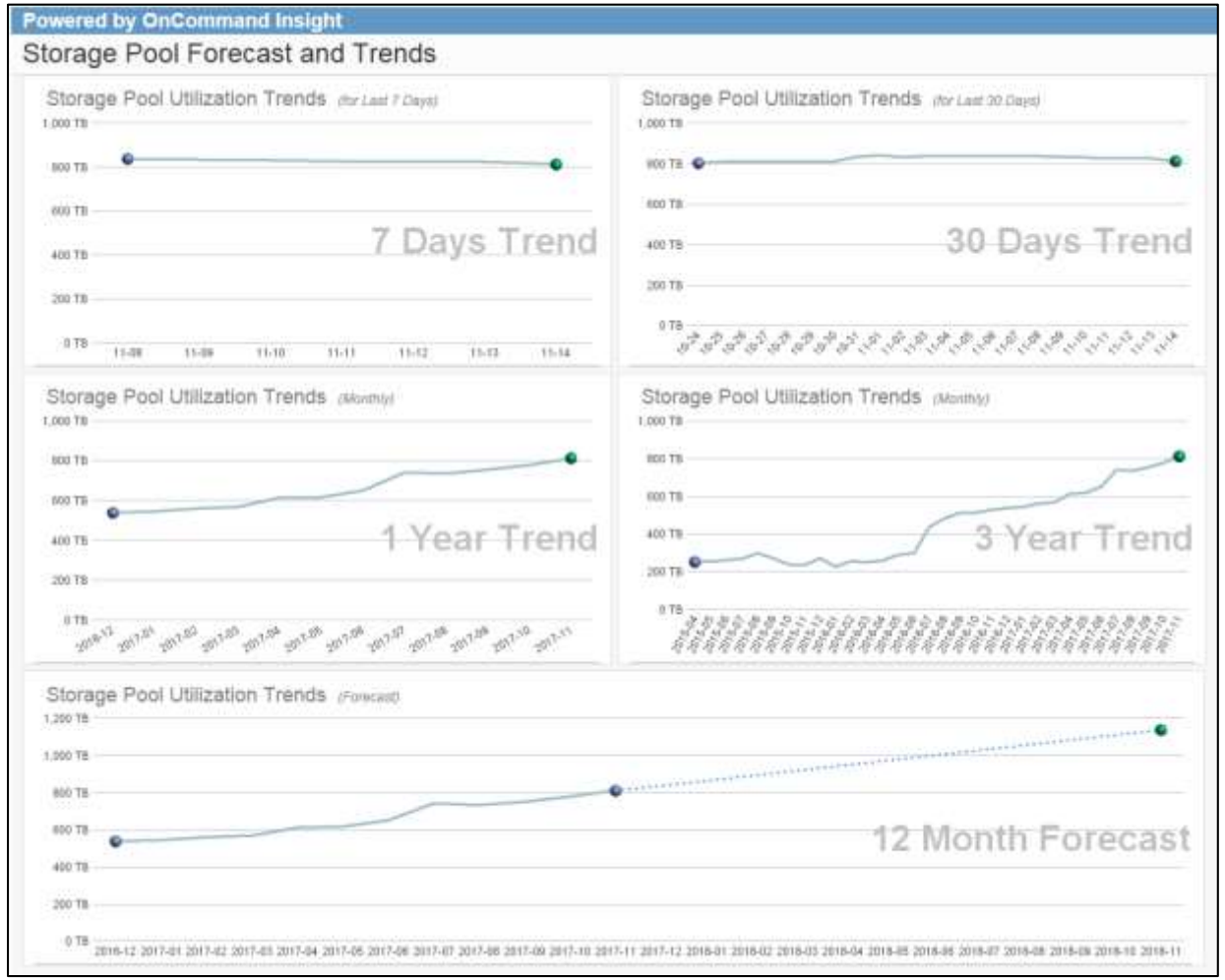
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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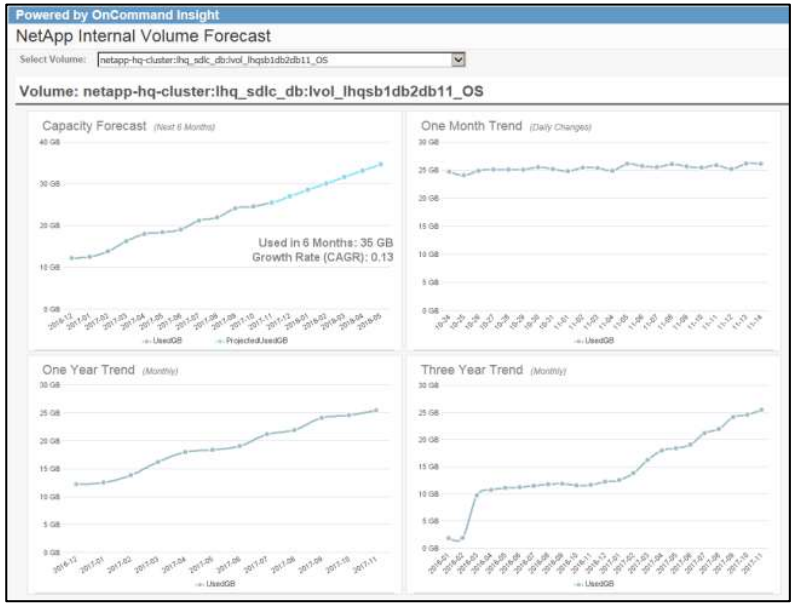
2.7 NetApp Internal Volume Forecast

Description: This report will show capacity trends and forecast for NetApp Internal Volumes or Flexvols. The report uses a Compound Average Growth Rate (CAGR) power function in MySQL to project Internal Volume capacity utilization for 6 months into the future. Trends include 30 days, 1 year and 3 years.

Prerequisites: Requires secondary ETL script to run nightly (mostly for execution speed). There is a Non-2nd ETL version as well. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Internal Volume	The NetApp Internal Volume or Flexvol associated with the aggregate and storage device monitored by OCI.
Compound Average Growth Rate (CAGR)	Function build into the SQL query to derive Growth Rate for future capacity projection. ROUND(power(EndUsed / BeginUsed, 1/TIMESTAMPDIFF(MONTH,beginDate,endDate))-1,2)
EndUsed	Internal Volume Current Used Capacity as reported by the Internal Volume Capacity Fact table in the DWH and as-of the last successful ETL Build.
BeginUsed	Internal Volume Used Capacity as reported by the Internal Volume Capacity Fact table 365 days ago.
Date	Fulldate field available in the DWH Date Dimension table.
UsedGB	Used capacity in GB as reported by the Internal Volume and contained in the Internal Volume Capacity Fact table.
Projected UsedGB	Projected Used Capacity (TB) for future 6 month period. Based on a Compound Average Growth Rate (CAGR) power function (see above) in MySQL
Internal Volume	The NetApp Internal Volume or Flexvol associated with the aggregate and storage device monitored by OCI.

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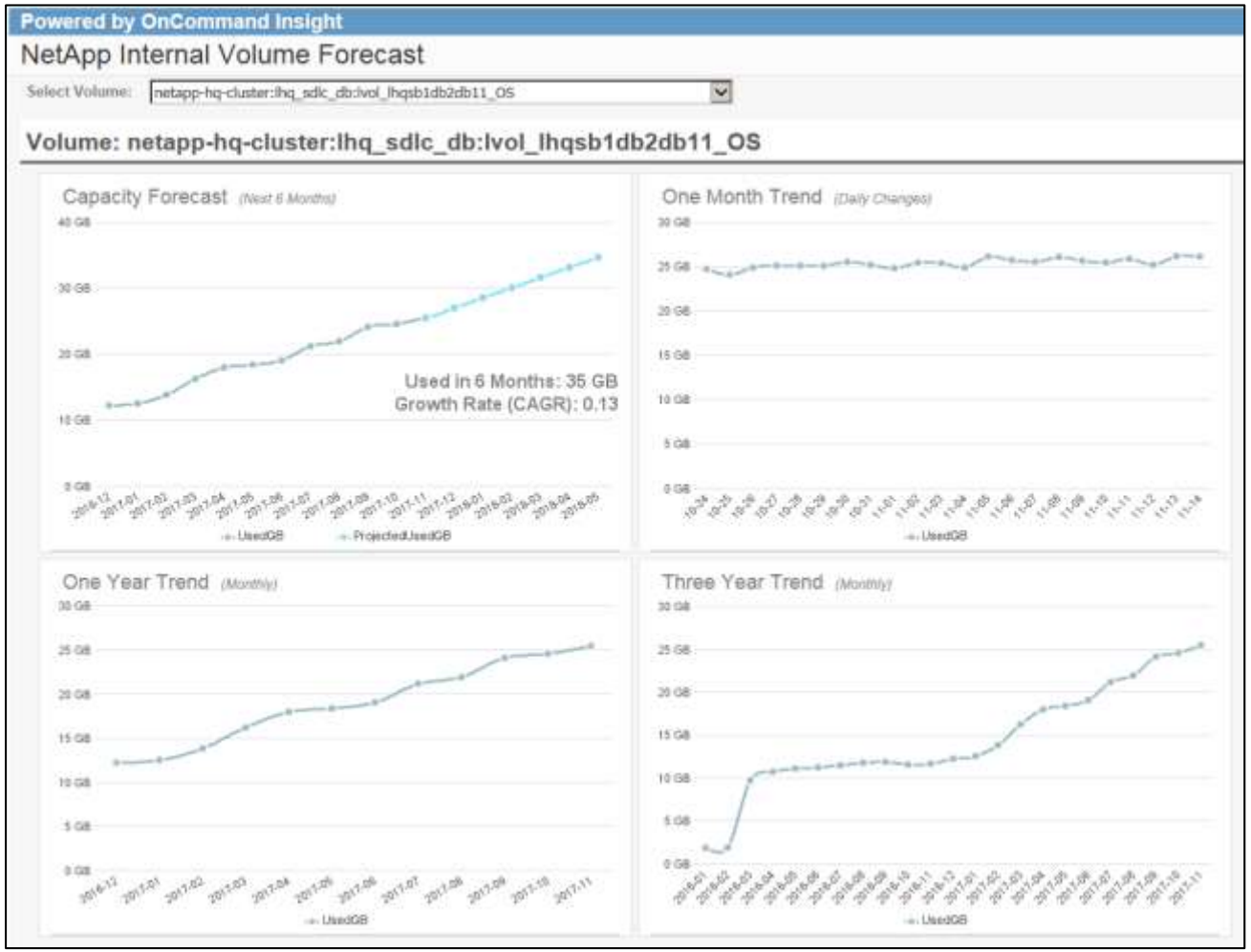
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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2.8 Storage Capacity Projections with WHAT-IF Scenario

Description: This interactive report will show capacity trends and forecast for multi-vendor storage devices. The report enables the user to input future capacity acquisition and dates of acquisition to compare results. The report uses linear regression to project capacity utilization 12 months into the future.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the storage device monitored by OCI.
Date	Fulldate field available in the DWH Date Dimension table.
Capacity (TB)	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Used Capacity (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Planned Projected (TB)	Projected Usable Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Projected Used (TB)	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Provisioned (TB)	Volume/ LUN based capacity that is allocated to host initiators.
Volume Consumed TB	Consumed Capacity in TB is capacity that is written. If the volume is THICK provisioned, then Consumed will be the same as Provisioned.
Internal Volume Allocated TB	Internal Volume Capacity in TB that is allocated to host initiators (NFS, CIFS).
Internal Volume Consumed TB	Internal Volume Consumed Capacity in TB is capacity that is written. If Space Guarantee is enabled, then Consumed will be the same as Allocated.
Subscribed TB	Provisioned and/or Internal Volume Allocated divided by Capacity.
Days to Full	The number of days (364 or less) that the storage pool is reporting (using linear regression formula) when the pool will be 100% full.

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Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption

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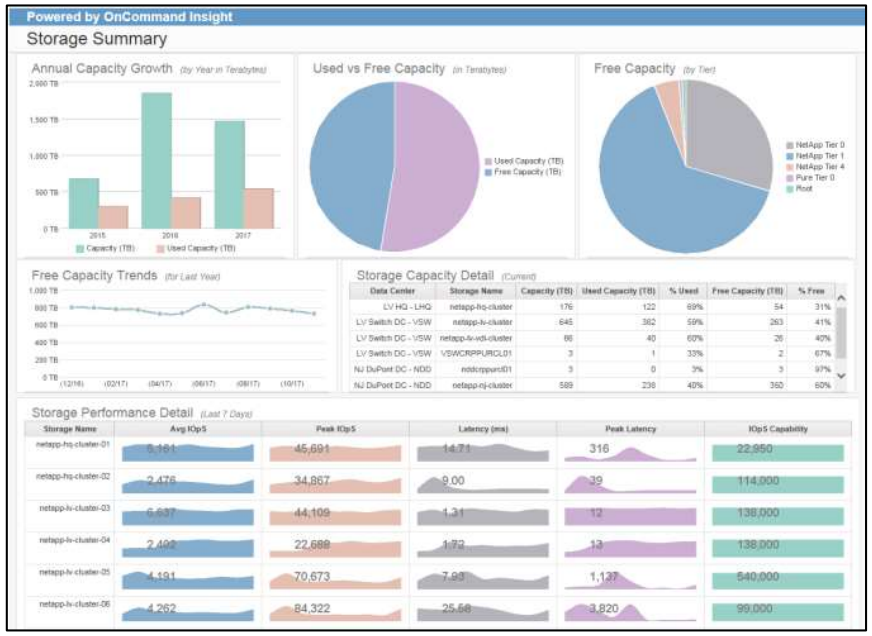
2.9 Storage Summary

Description: This dashboard provides a Storage Summary involving current global capacity status, capacity growth trends, performance trends vs performance capabilities as well as storage inventory.

Prerequisites: Annotations/definitions necessary are Tier or Service Level. The report requires the secondary ETL script to run nightly. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Storage Name	Name of the storage device monitored by OCI.
Tier	OCI configured annotation. Defines tiers of storage or Service Levels based on disk type, disk speed, or IOpS/TB.
Capacity (TB)	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Used Capacity (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Free Capacity (TB)	Capacity (TB) – Used Capacity (TB)
% Used	Used Capacity (TB) / Capacity (TB)
% Free	Free Capacity (TB) / Capacity (TB)
Date	Fulldate field available in the DWH Date Dimension table.
Avg IOpS	Measures the total number of I/O service requests on the volume averaged daily for 7 days (measured in I/O per sec).
Peak IOpS	Measures the total number of Peak I/O service requests on the volume daily for 7 days (measured in I/O per sec).
Latency	Average Latency in milliseconds for 7 days.
Peak Latency	Maximum Latency for 7 days.
IOpS Capability	Sam as Max Supported IOpS. The IOpS Capability of the Storage Pool as published by the drive manufacturer. Example: a 15K SAS drive supports 200 IOpS.

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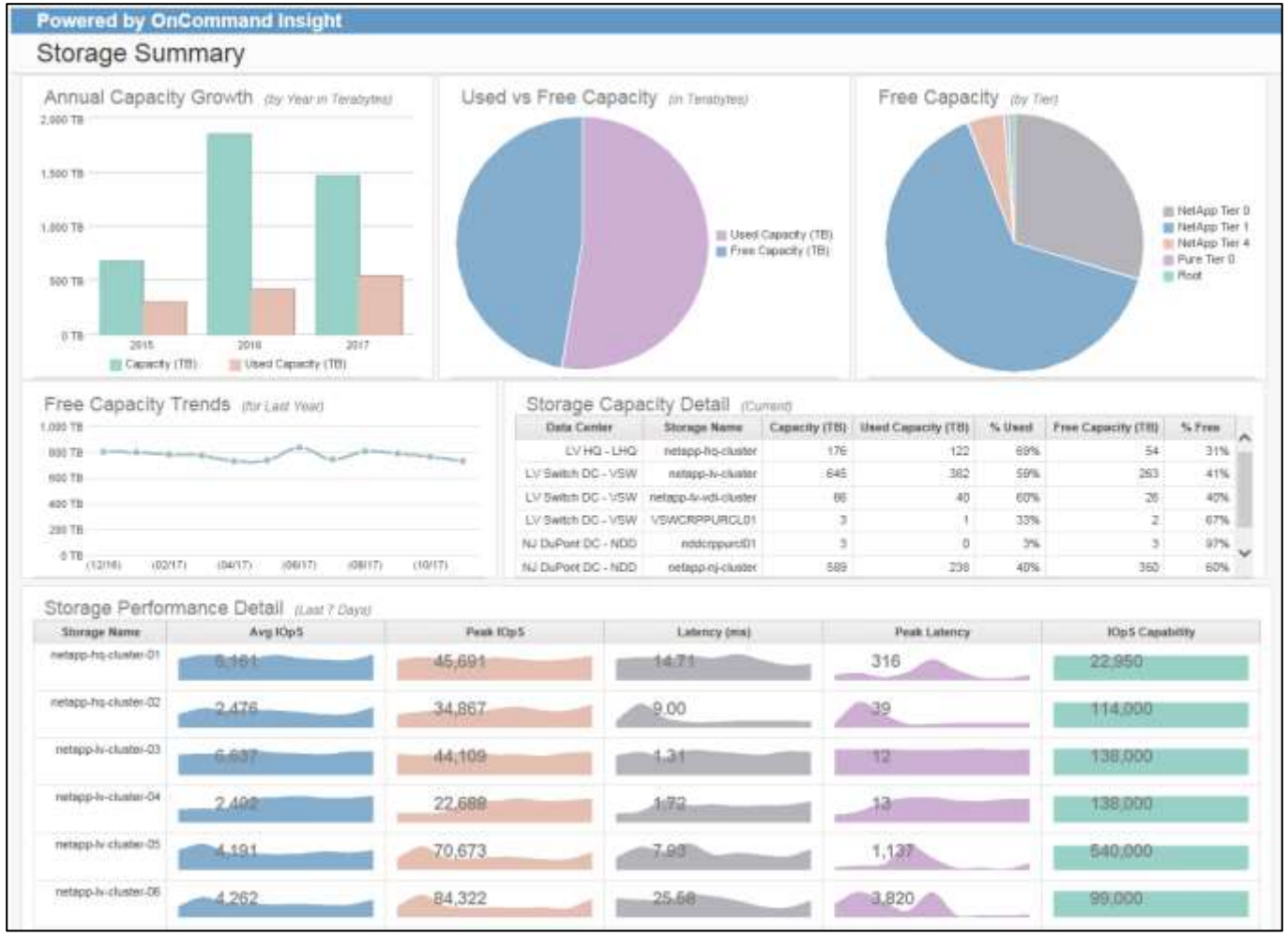
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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2.10 Service Level Objectives – Capacity

Description: This dashboard shows Service Level Objectives with a focus on Allocated/Provisioned Capacity. Service Levels and costs are pre-defined at the top right and can be changed on the fly. Service Levels are based on IOpS/TB or IO Density. Objective Thresholds are provided as IOpS Limit and Latency Limit by Service Level. Volumes and Workloads (Applications) are analyzed showing Exceptions, Costs, and Capacity Allocations. Workload Detail list will highlight exceptions for Latency and Total IOpS that exceed limits.

Prerequisites: Annotations/definitions are necessary for Costs, and Service Levels. Requires secondary ETL script to run nightly. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Workloads	OCI configured annotation. Defines the Application associated with host or internal volume capacity.
Volume	Name of the Volume or Internal Volume (Flexvol) associated with the storage device monitored by OCI.
Allocated TB	Volume or Flexvol based capacity that is allocated to host initiators.
Costs	OCI configured annotation. Defines cost per GB per storage tier or Service Level.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
IOpS/TB	Also known as IO Density, this is the amount of IOpS delivered per TB of storage capacity.
IOpS	Measures the total number of I/O service requests on the volume sum of average, daily for 7 days (measured in I/O per sec).
Latency	Average Response time or Latency in milliseconds collected for a period of 14 days.
Service Level	Based on IOpS/TB –Service Level DEFAULTS are defined as follows: • Capacity = IOpS/TB < 128 • Value = IOpS/TB < 512 • Performance = IOpS/TB < 1024

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Click on the report screen shot above to view an enlarged image.

Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption

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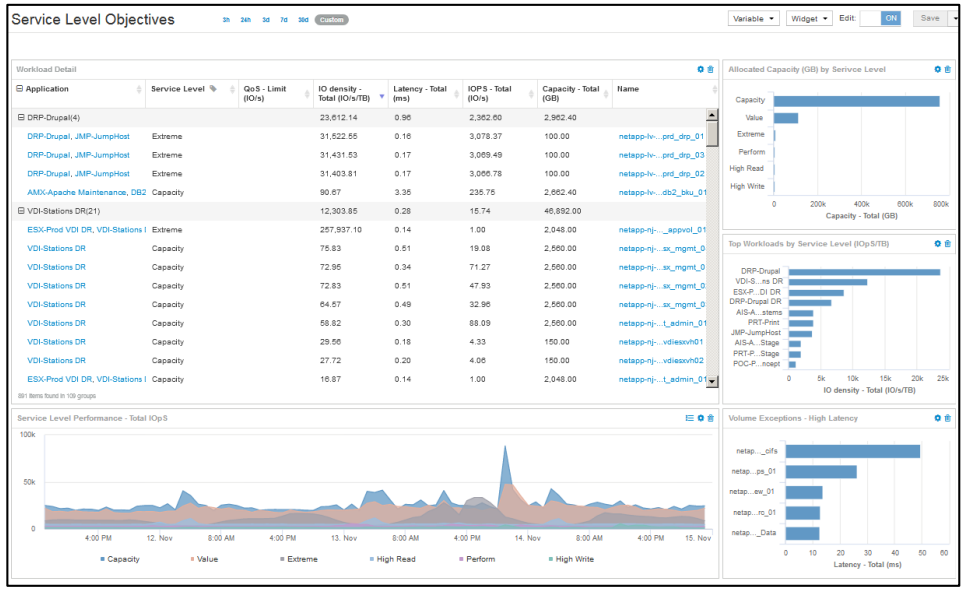
2.10 WebUI – Service Level Objectives

Description: This WebUI based dashboard shows Application capacity and performance grouped by Service Level. QoS Limits, associated with NetApp ONTAP Service Level Design, are listed but may not be populated depending on the state of the controller monitored by OCI. Total IOpS performant trend intervals can be changed on the fly. All fields highlighted in 'blue' are drillable to a detailed landing page.

Prerequisites: Annotations/definitions are necessary for Applications, and Service Levels. Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover and Perform.



Data Dictionary

☐ **Select This Report**

Field	Description
Workloads/Application	OCI configured annotation. Defines the Application associated with host or internal volume capacity.
Volume	Name of the Volume or Internal Volume (Flexvol) associated with the storage device monitored by OCI.
Allocated TB	Volume or Flexvol based capacity that is allocated to host initiators.
QoS Limit (IO/s)	Quality of Service Limit for IOpS as configured in ONTAP for each controller.
IO Density (IOpS/TB)	IO Density or IOpS/TB, is the amount of IOpS delivered per TB of storage capacity.
Latency	Average Response time or Latency in milliseconds for the selected time period.
IOpS (Total IO/s)	Measures the total number of I/O service requests on the volume for the user selected time period .
Capacity – Total (GB)	Volume Allocated Capacity in GB.
Name	Same as Volume. This is the volume associated with the Application in OCI.
Service Level	Based on IOpS/TB –Service Level DEFAULTS are defined as follows: • Capacity = IOpS/TB < 128 • Value = IOpS/TB < 512 • Performance = IOpS/TB < 1024 • High Read = IOpS/TB < 2048 • High Write = IOpS/TB < 4096 • Extreme = IOpS/TB > 4096

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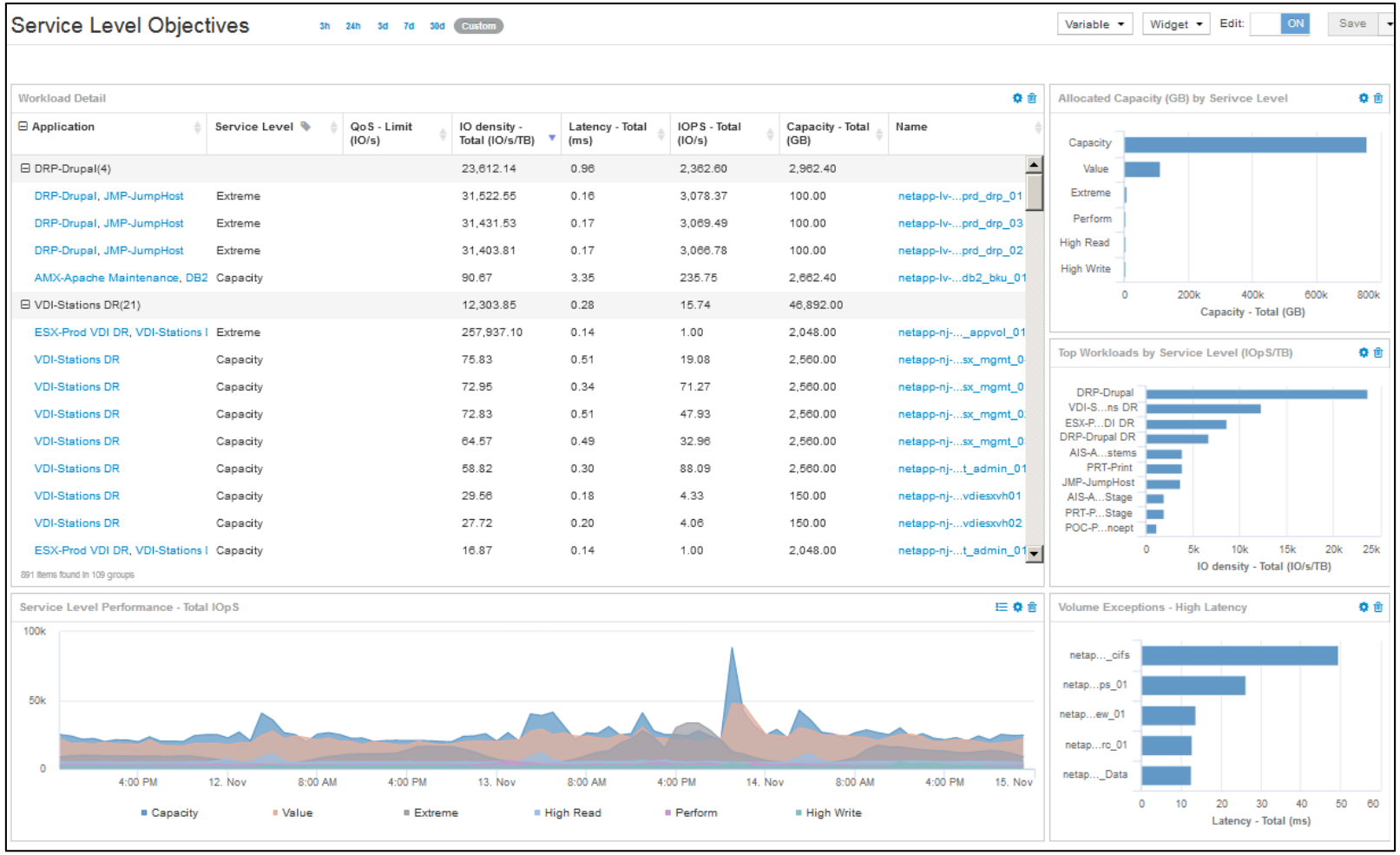
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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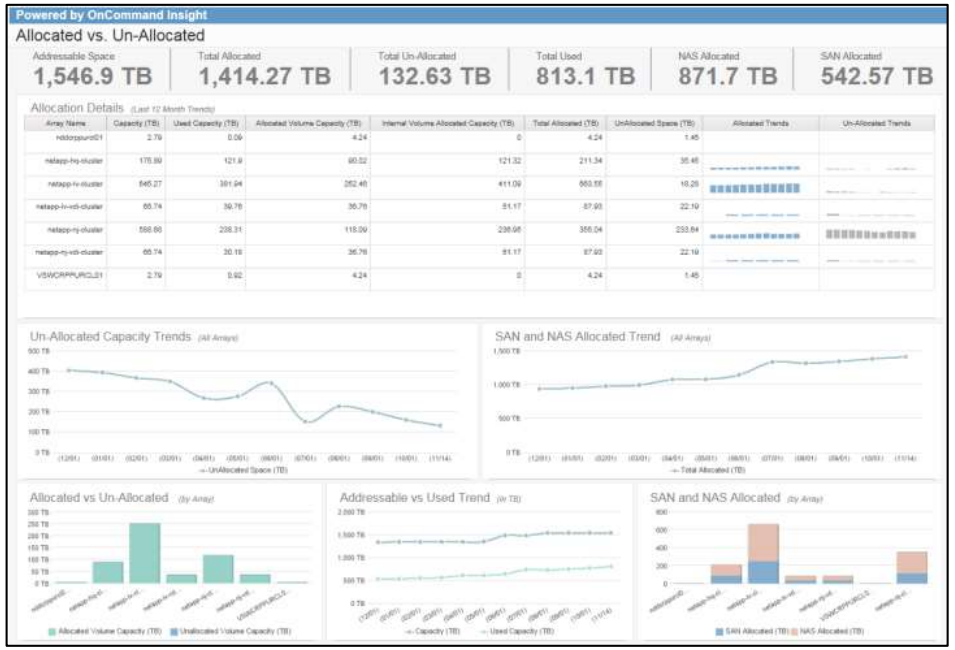
NetApp

2.11 Allocated vs Un-Allocated Capacity

Description: This dashboard shows total addressable storage with a breakdown of Allocated versus Unallocated, combined SAN & NAS Allocated, and trending. At the bottom is shown Allocated vs. Un-Allocated by Array, Top Total Addressable, Top 5 Arrays with Un-Allocated, and combined SAN and NAS by Array.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Array Name	Name of the storage device monitored by OCI.
Addressable Space TB	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Total Allocated TB	Allocated Volume Capacity (TB) + Internal Volume Allocated (TB)
Total Un-Allocated TB	IF((([Total Allocated (TB)]-[Capacity (TB)])*-1) < 0) THEN (([Total Allocated (TB)]-[Capacity (TB)])) ELSE (([Total Allocated (TB)]-[Capacity (TB)])*-1)
Total Used TB	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
NAS Allocated TB	Internal Volume Capacity in TB that is allocated to host initiators (typically NFS or CIFS)
SAN Allocated TB	Volume/ LUN based capacity that is allocated to host initiators.
Capacity (TB)	Same as Addressable Space.
Used Capacity (TB)	Same as Total Used.
Allocated Volume Capacity (TB)	Same as SAN Allocated.
Internal Volume Allocated (TB)	Same as NAS Allocated.
Un-Allocated Space (TB)	Same as Total Un-Allocated.
Allocated Trends	Trend of Allocated Capacity for the past year.
Un-Allocated Trends	Trend of Un-Allocated Capacity for the past year.
Array Name	Name of the storage device monitored by OCI.

 Click on the report screen shot above to view an enlarged image.

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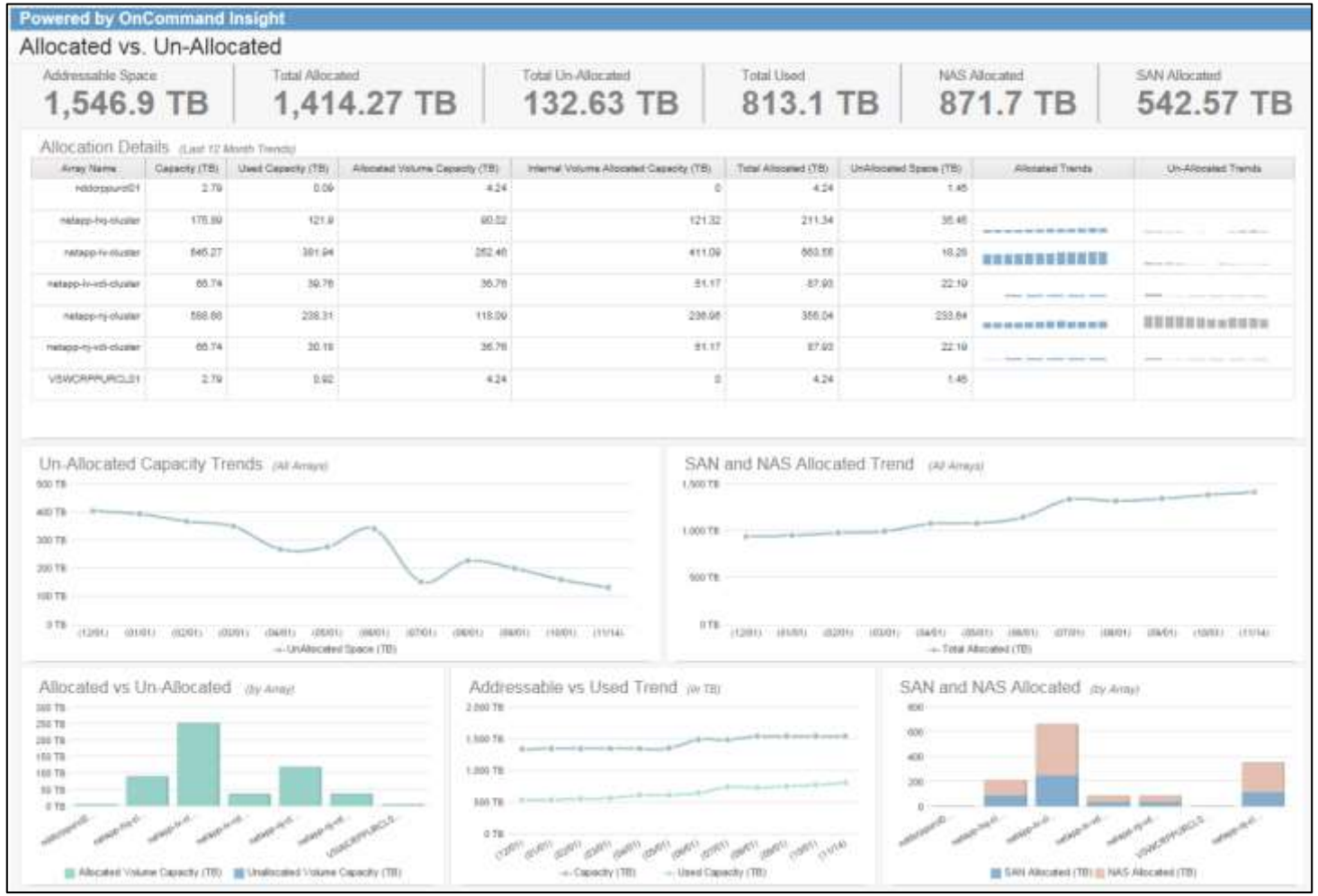
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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2.12 Available Capacity Dashboard

Description: This dashboard provides single "pane-of-glass" insight for Available Capacity. Starting from the top left is a chart showing Available Capacity broken down by Array. The chart in the middle displays a gauge showing overall Usable & Available Capacity. On the top right is a forecast of the Top Growing Arrays over the next 12 months. The middle of the report shows a bar chart displaying Total Capacity Available contrasted against Usable. The bottom section shows trending for Available Capacity (i.e., "What is the trend for consumption?"). The last two (2) charts breakdown Available Capacity by Data Center and by Vendor.

Prerequisites: Annotations/definitions are necessary for Data Center. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Storage Name/Array	Name of the storage device monitored by OCI.
Vendor	Name of the vendor associated with the storage device monitored by OCI.
Total Usable Capacity TB	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Unused Capacity TB	Total Usable Capacity TB - Total Used Capacity TB
Total Used Capacity TB	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Total Reclamation Capacity TB	Provisioned Not Mapped + Unconfigured TB + Orphaned Performance TB
Projected Used Capacity TB	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Provisioned Not Mapped	Unused Volume Capacity as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Unconfigured TB	Unconfigured Capacity as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Orphaned Performance TB	If totaliopsmax (Peak IOpS) is equal to (0) Zero for 90 days, then the allocated capacity is flagged as orphaned by performance.
Total IOpS Max (Peak IOpS)	Used to determine Orphaned Capacity by Performance.

 Click on the report screen shot above to view an enlarged image.

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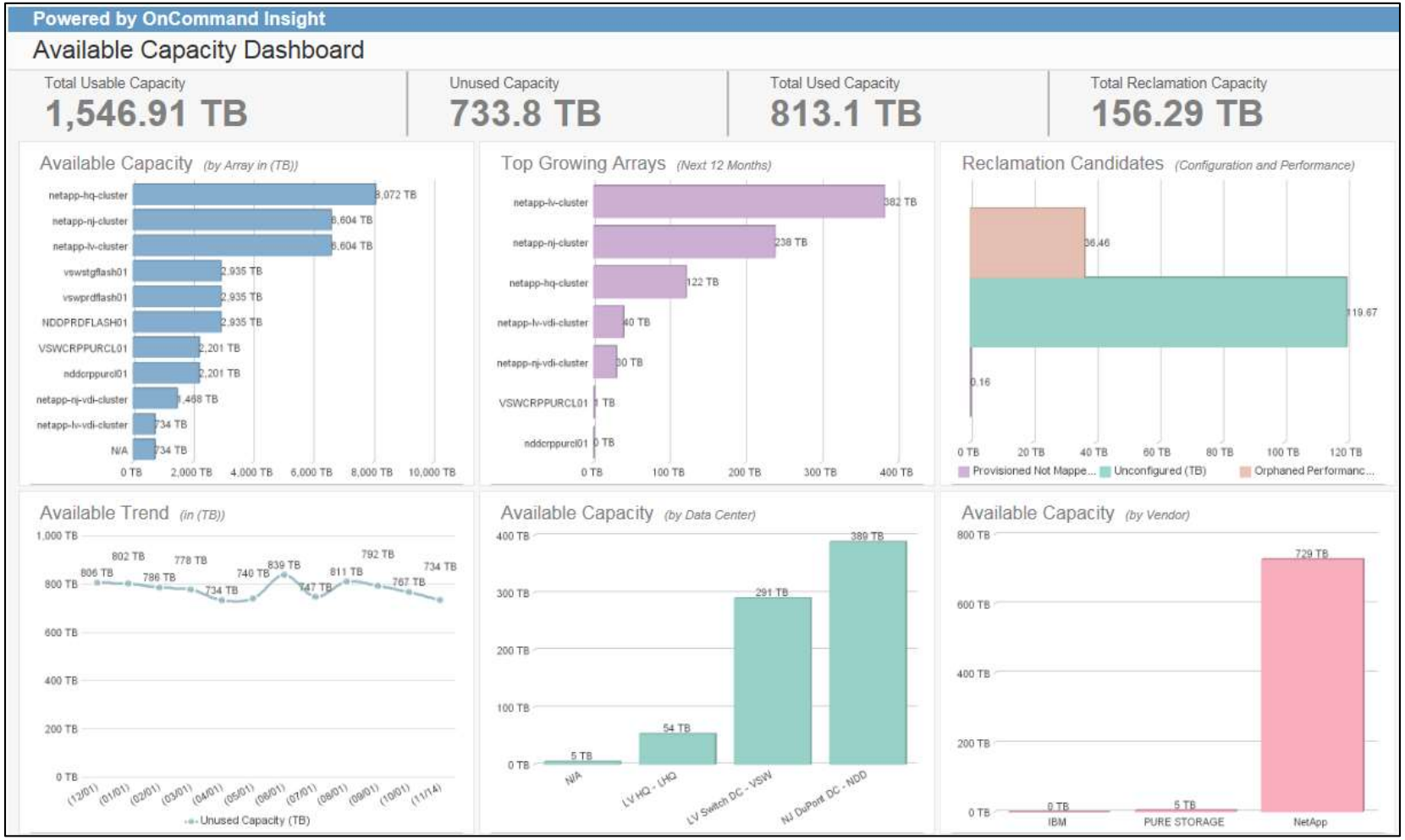
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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2.13 Global Capacity Changes

Description: This dashboard illustrates the overall physical storage footprint for the Global storage infrastructure. Across the top is Total Raw, Total Raw Un-configured, Total Usable, and Total Allocated capacity with changes from the previous month. It shows Used Capacity and Utilization trending into the next 12 months. Across the bottom portion are depicted various Costs and Used vs. Free Capacity. The very bottom chart displays a cost perspective depicting Used Costs vs. Total Average IOpS per array (each bubble representing an array).

Prerequisites: Annotations/definitions are necessary for costs and Service Level/Tier. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Tier	OCI configured annotation. Defines tiers of storage or Service Levels based on disk type, disk speed, or IOpS/TB.
Cost	OCI configured annotation. Defines cost per GB per storage tier or Service Level.
Array	Name of the storage device monitored by OCI.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Total Raw Capacity TB	Pre-RAID raw capacity in TB as reported by the Storage Array monitored by OCI and contained in the Storage and Storage Pool Capacity Fact table.
Total Raw Unconfigured Capacity TB	Unconfigured Capacity as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Total Usable Capacity TB	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Used (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Free (TB)	Total Usable Capacity TB - Used (TB)
Total Allocated Capacity TB	Allocated Volume Capacity (TB) + Internal Volume Allocated (TB) as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Free Capacity TB	Same as Free (TB).
Projected Used Capacity TB (Utilization Trending)	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Projected Used % (Utilization Trending)	Projected Used Capacity % for future 12-month period. Uses Projected Used divided by Projected Usable.
Changes	Difference between current capacity and capacity from 30 days ago.
Changes %	% of Change between current capacity and capacity from 30 days ago.
Total Usable Costs	Total Usable Capacity TB * Cost
Total IOpS	Measures the total number of I/O service requests on configured Data Disks from the disk hourly performance fact table for the last 14 days.

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Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption

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2.14 Global Environment Changes

Description: This dashboard depicts the overall physical storage footprint as well as global ports (excludes logical ports) within the global infrastructure. The first half gives an overall view of Raw, Usable, and Provisioned Capacity (both SAN and NAS volumes) and their changes from the previous month, as well as trending and breakdown by Data Center. The second half gives a high-level overview of the infrastructures top resources and breaks down the Capacity and Performance (average data disk utilization) metrics of each array.

Prerequisites: Annotations/definitions are necessary for Data Center and Applications. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Application	OCI configured annotation. Defines the Application associated with host or internal volume capacity.
Array	Name of the storage device monitored by OCI.
Date	Fulldate field available in the DWH Date Dimension table.
Total Raw Capacity TB	Pre-RAID raw capacity in TB as reported by the Storage Array monitored by OCI and contained in the Storage and Storage Pool Capacity Fact table.
Total Usable Capacity TB	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Total NAS Allocated TB	Internal Volume Capacity in TB that is allocated to host initiators (typically NFS or CIFS).
Total SAN Allocated TB	Volume/ LUN based capacity that is allocated to host initiators.
Raw (TB)	Same as Total Raw Capacity TB.
Usable (TB)	Same as Total Usable Capacity TB.
Used (TB)	Same as Total Used Capacity.
Total Ports	Sum of fibre channel ports that are licensed, do not contain VFC, are not NPV, and not like type ICL
Used Ports	Sum of ports that are accessed.
Free Ports	Total Ports – Used Ports
Switch Name	Name of the switch monitored in OCI.
Total IOpS	Average IOpS collected over 14 days hourly associated with the Applications supported by volumes or internal volumes.
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Application	OCI configured annotation. Defines the Application associated with host or internal volume capacity.

 Click on the report screen shot above to view an enlarged image.

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Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption

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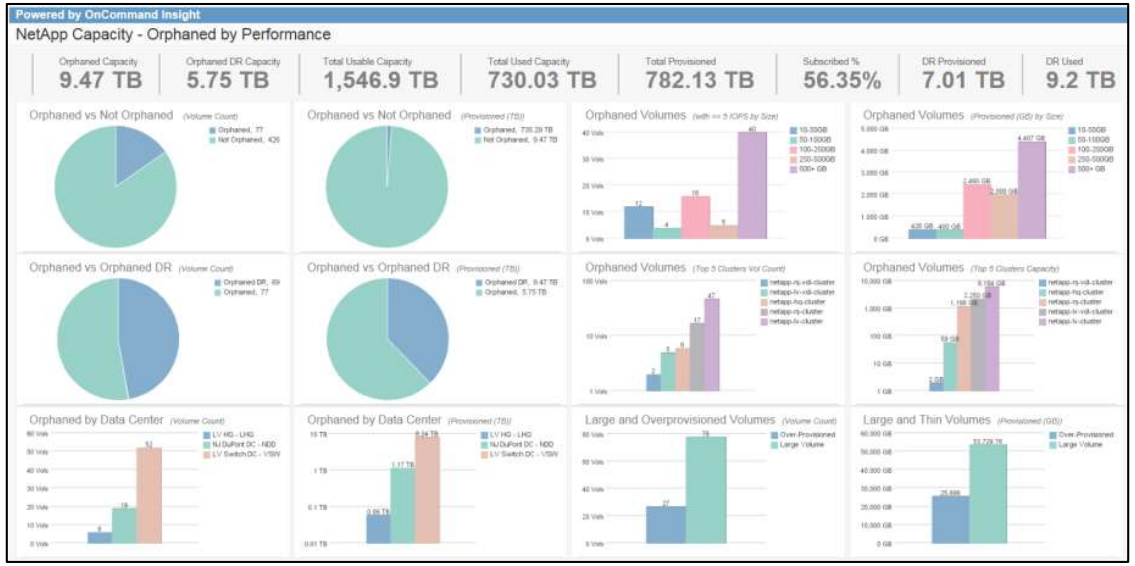
2.15 NetApp Capacity – Orphaned by Performance

Description: Focusing on NetApp Storage, this dashboard shows orphaned capacity by performance, orphaned vs not orphaned, orphaned volume count by size, by Data Center and by cluster. A comparison of orphaned capacity vs orphaned DR capacity is also illustrated.

Prerequisites: Annotations/definitions are necessary for Data Center. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
CDOT Cluster Name	Name of the NetApp CDOT Cluster monitored by OCI.
Volume Count	Count of volumes that meet a criterion.
Volume Size Ranges	Size of volumes in GB broken down by 10-50GB, 50-100GB, 100-250GB, 250-500GB and over 500GB.
Provisioned	Provisioned Capacity in GB or TB, represents internal volume capacity presented to host initiators (typically using NFS or CIFS protocols).
IOpS	Measures the total number of I/O service requests on the internal volume averaged daily for 90 days.
Over-provisioned	This is internal volume allocated capacity that is flagged as thin provisioned.
Orphaned by Performance Criteria	NetApp Internal Volumes that have (0) Zero Peak IOpS for 90 days.
DR Capacity	Allocated capacity reported by internal volumes that have snap relationships.

 Click on the report screen shot above to view an enlarged image.

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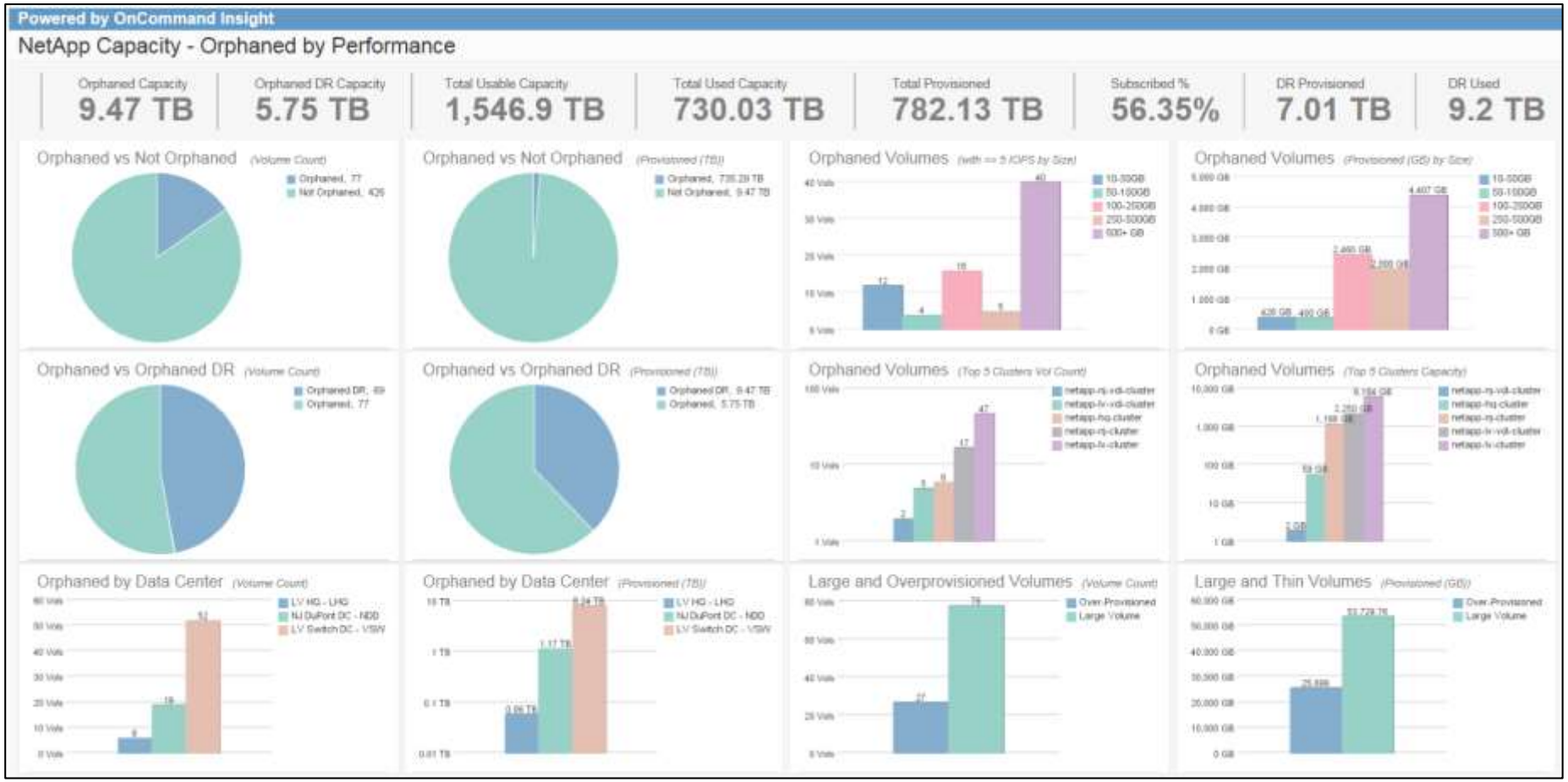
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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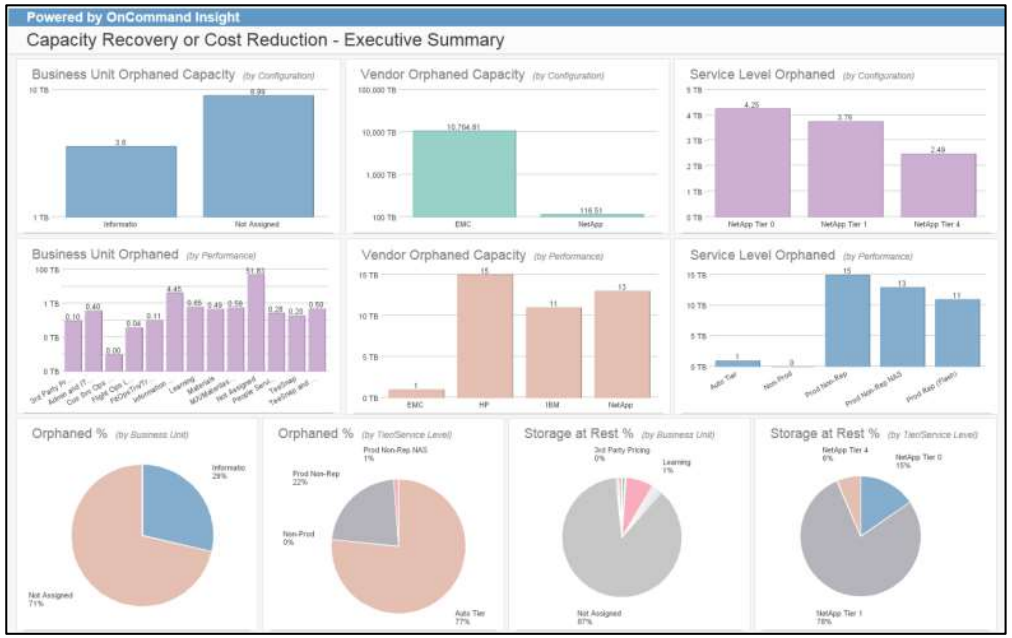
2.16 Capacity Recovery or Cost Reduction – Executive Summary

Description: This is an Executive dashboard showing Capacity not being used (i.e., Orphaned) and a candidate for reclamation or more efficient utilization. There are six charts which show the orphaned storage by Business Unit, by Vendor, by Service Level, Business Unit by Performance, Vendor by Performance, and Service Level by Performance. Across the bottom are charts offering quick insight into potential reclaimed/reused storage.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Business Unit	OCI configured annotation. Defines Business Unit associated with host or internal volume capacity.
Service Level / Tier	OCI configured annotation. Defines tiers of storage or Service Levels based on disk type, disk speed, or IOpS/TB.
Vendor	Name of the vendor associated with the storage device monitored by OCI.
Allocated TB Orphaned by Configuration	orphanedCapacity field as contained in the dwh_capacity.volume_history_capacity_fact table. Refers to capacity that is not mapped or masked to storage ports or host initiators.
Allocated TB Orphaned by Performance	Volumes that have (0) Zero Total IOpS for 90 days.

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Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption

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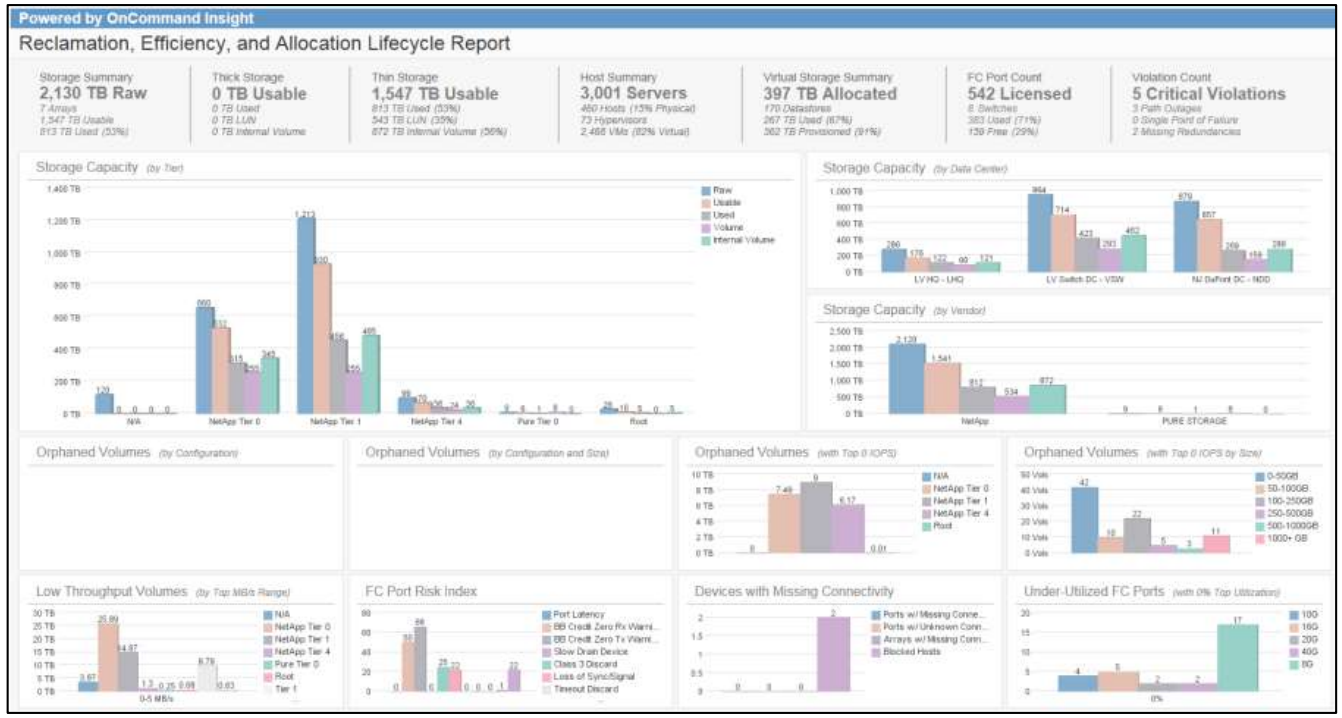
2.17 Reclamation, Efficiency, and Allocation Life Cycle
(Page 1 of 2)

Description: This dashboard shows storage infrastructure metrics from a storage capacity, virtual and physical host, switch and policy violation perspective. At the top of the page is a detailed summary of these categories. Below the summary are charts that show storage capacity by tier, by data center and by vendor. The next row of charts show Reclamation candidates by configuration and performance and the bottom charts show Port Risks and port connectivity status. There are several tabs at the top of the report that enable the user to switch between over-all infrastructure and virtual compute infrastructure. Charts and metrics are similar for both tabs.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

See next page

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2.17 Reclamation, Efficiency, and Allocation Life Cycle (Page 2 of 2)

Field	Description
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Tier	OCI configured annotation. Defines tiers of storage or Service Levels based on disk type, disk speed, or IOpS/TB.
Vendor	Name of the vendor associated with the storage device monitored by OCI.
Raw	Pre-RAID raw capacity in TB as reported by the Storage Array monitored by OCI and contained in the Storage and Storage Pool Capacity Fact table.
Usable	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Used	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Volume	Volume/ LUN based capacity that is allocated to host initiators.
Internal Volume	Internal Volume Capacity in TB that is allocated to host initiators (typically NFS or CIFS).
Violation Count	Total number of violations as configured by OCI path and threshold policies.
Path Outages	The count of path outages caused by a breach of SAN Path Policies.
Single Point of Failure	The count of devices that breach the SPF Path Policy.
Missing Redundancies	The count of devices that have missing path redundancies as defined in SAN Path Policy.
Datastore Allocated	Amount of capacity in TB allocated to ESX Datastores.

Data Dictionary

☐ **Select This Report**

Field	Description
Datastore Provisioned	Amount of Datastore capacity provisioned to Virtual Machines.
Port Latency	bbCreditZeroMsTx > 0
BB Credit Zero Rx Warning	bbCreditZeroRx > 1000000
BB Credit Zero Tx Warning	bbCreditZeroTx > 1000000
Slow Drain Device	bbCreditZeroRx > 1000000 AND bbCreditZeroMsTx > 0
Class 3 Discard	Count of Class 3 Discards
Loss of Sync/Signal	Count of Sync or Signal loss
Timeout Discard	portErrorsTimeoutDiscardTx > 0
Ports w/Missing Connectivity	dwh_inventory.switch_port.type LIKE '%E%' AND dwh_inventory.switch_port.name NOT LIKE '%port-ch%' AND dwh_inventory.switch_port.id NOT IN (SELECT dwh_inventory.port_connectivity.portId FROM dwh_inventory.port_connectivity)
Ports w/Unknown Connectivity	dwh_inventory.switch_port.status = 'OK' AND dwh_inventory.switch_port.rawPortStatus = 'Online'
Arrays w/Missing Connectivity	dwh_inventory.storage.id NOT IN (SELECT dwh_inventory.physical_path.storageId FROM dwh_inventory.physical_path)
Blocked Hosts	Count of hosts that cannot reach any volumes or shares.

See previous page

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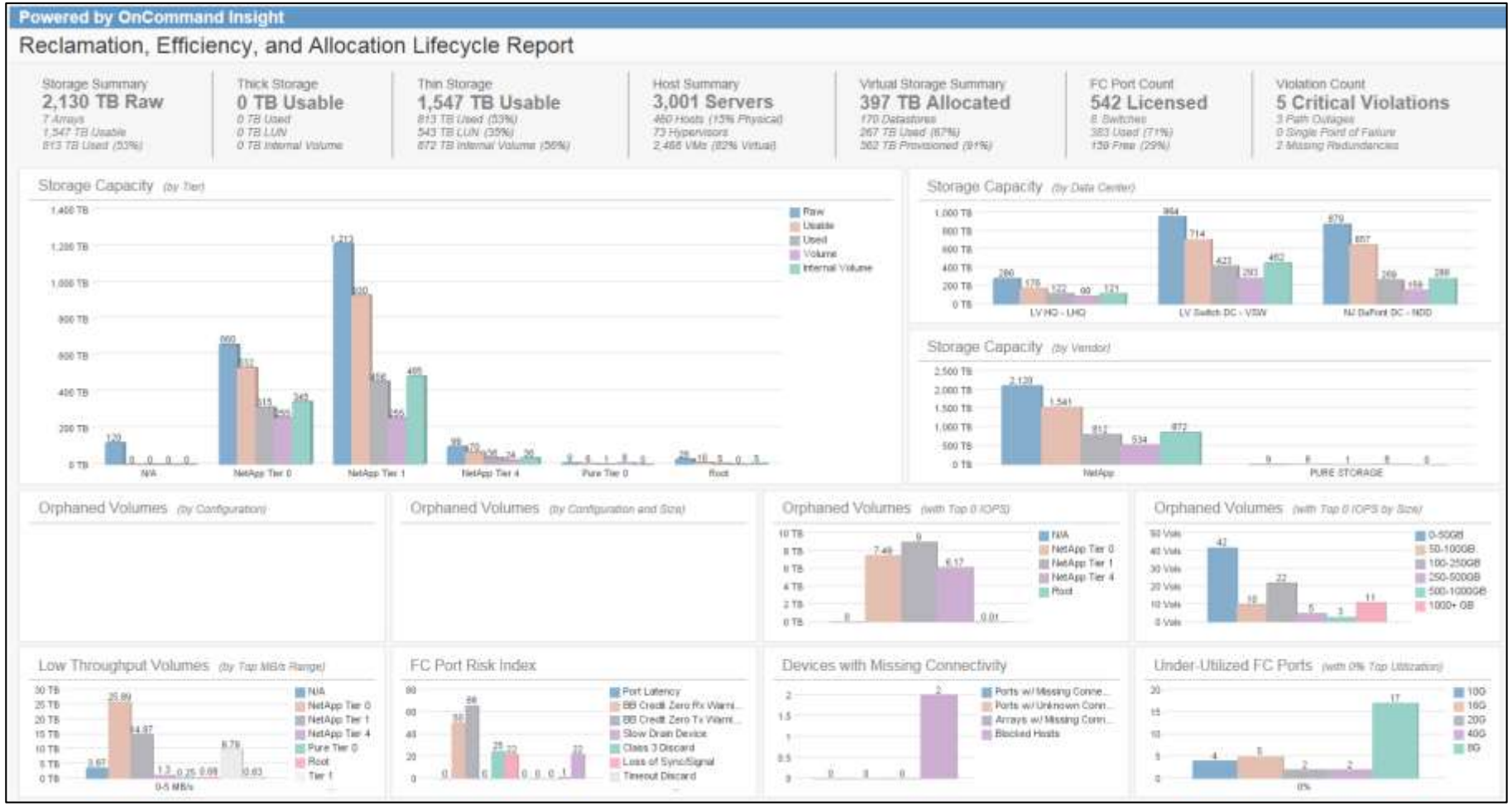
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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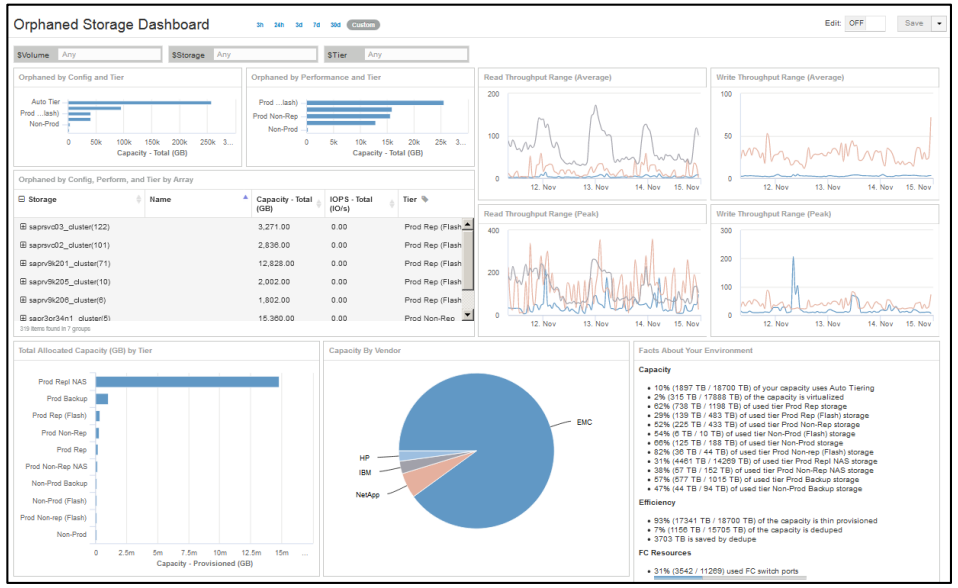
2.18 WebUI – Orphaned Storage Dashboard

Description: This WebUI based dashboard shows Orphaned Capacity by Configuration and Performance. The criteria used to filter volumes by configuration are those that do not have an active path to a host initiator. The criteria for Orphaned by Performance are volumes with (0) Zero IOpS. The time period is selected by the user. Trending charts for Read and Write Throughput are used to show throughput ranges over time.

Prerequisites: Annotations/definitions are necessary for storage tiers. Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover and Perform.



Data Dictionary

☐ **Select This Report**

Field	Description
Tier	OCI configured annotation. Defines tiers of storage or Service Levels based on disk type, disk speed, or IOpS/TB.
Storage	Name of the storage device monitored by OCI.
Vendor	Name of the vendor associated with the storage device monitored by OCI.
Name	Name of the Volume or Internal Volume (Flexvol) associated with the storage device monitored by OCI.
Capacity Total (GB)	Usable capacity in TB as reported by the storage pool or aggregate.
IOpS Total (IO/s)	Measures the total number of I/O service requests on the volume as collected for the specified period. Filter set to equal (0) Zero.
Capacity – Provisioned (GB)	Volume Allocated Capacity in GB.
Read Throughput Range (Average)	Blue Line – Read MB/s = 1 to 10 Baige Line – Read MB/s = 11-50 Gray Line – Read MB/s >=51
Read Throughput Range (Peak)	Same as above.
Write Throughput Range (Average)	Same as above.
Write Throughput Range (Peak)	Same as above.
Date	The date field applied to trending charts and selectable by the user.
Tier	OCI configured annotation. Defines tiers of storage or Service Levels based on disk type, disk speed, or IOpS/TB.
Storage	Name of the storage device monitored by OCI.

 Click on the report screen shot above to view an enlarged image.

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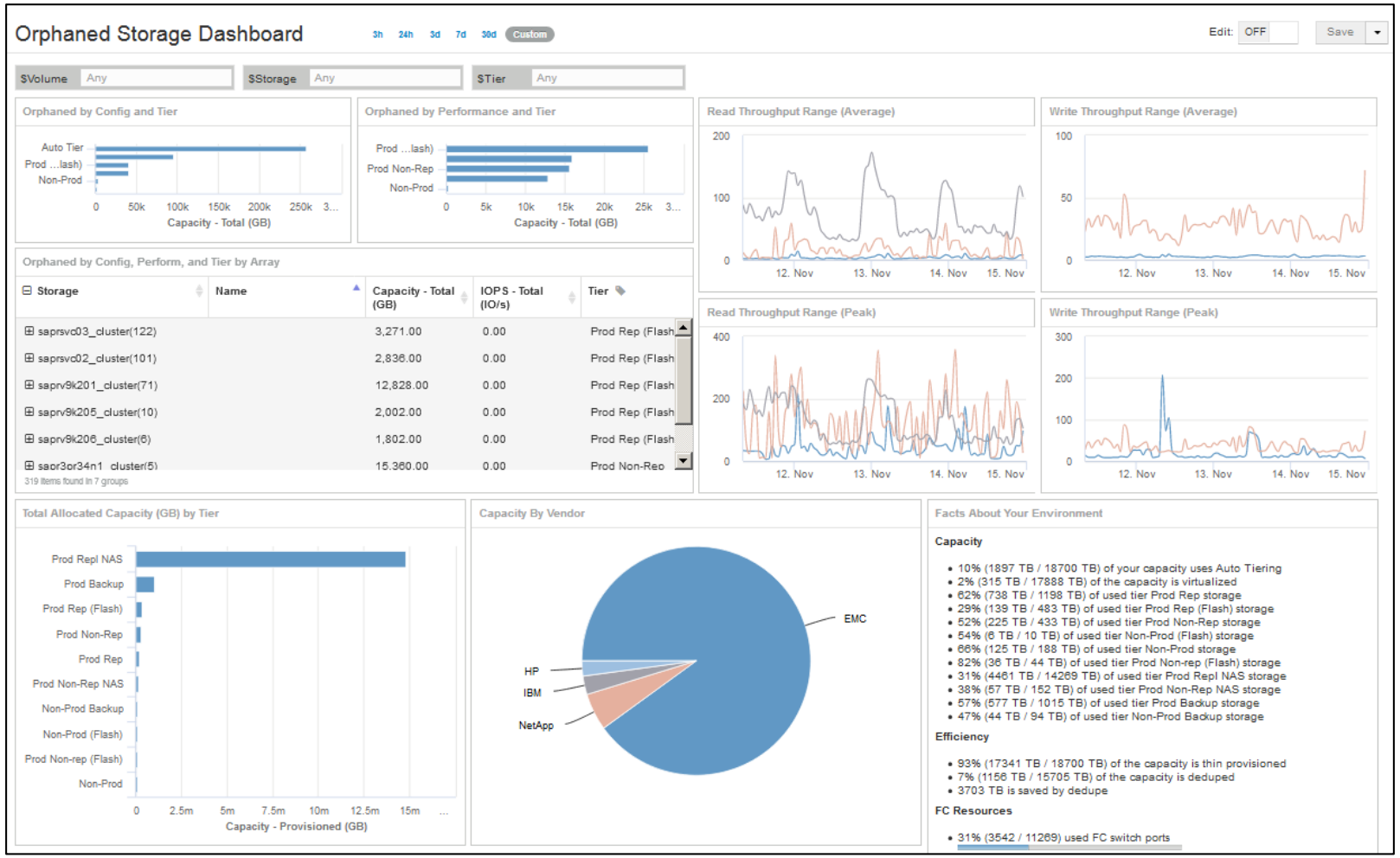
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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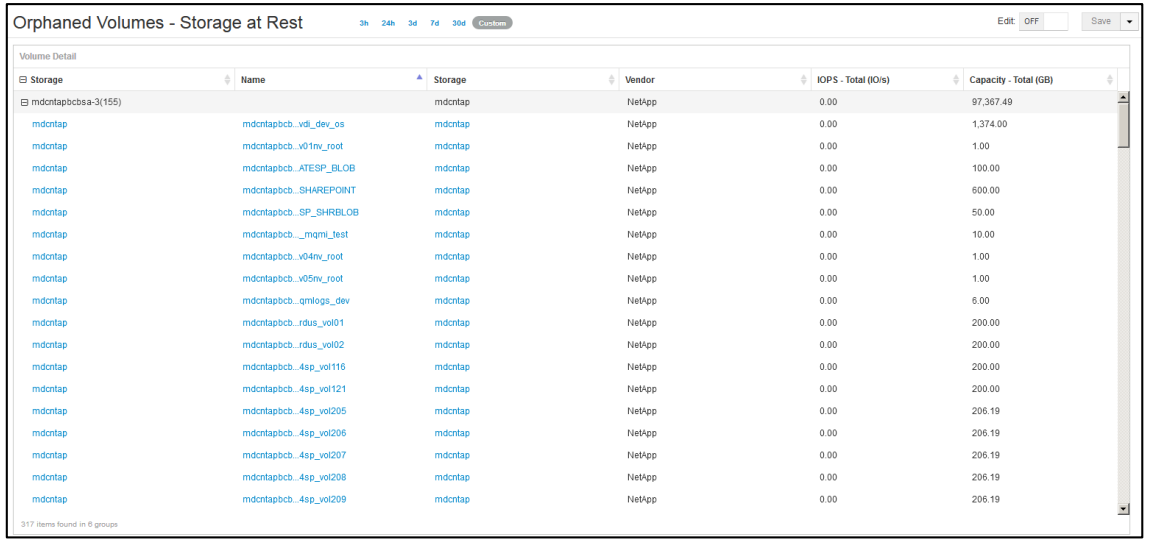
2.19 WebUI – Orphaned Volumes – Storage at Rest

Description: This WebUI based dashboard shows storage at rest. Storage at Rest is defined as volumes with IOpS equal to (0) Zero for a defined period. The period is selectable by the user.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover and Perform.



Storage	Name	Storage	Vendor	IOPS - Total (IO/s)	Capacity - Total (GB)
mdcntapbcbsa-3(155)		mdcntap	NetApp	0.00	97,367.49
mdcntap	mdcntapbcb...vdi_dev_os	mdcntap	NetApp	0.00	1,374.00
mdcntap	mdcntapbcb...v01nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...ATESP_BLOB	mdcntap	NetApp	0.00	100.00
mdcntap	mdcntapbcb...SHAREPOINT	mdcntap	NetApp	0.00	600.00
mdcntap	mdcntapbcb...SP_SHRBLOB	mdcntap	NetApp	0.00	50.00
mdcntap	mdcntapbcb..._mqmi_test	mdcntap	NetApp	0.00	10.00
mdcntap	mdcntapbcb...v04nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...v05nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...qmlogs_dev	mdcntap	NetApp	0.00	6.00
mdcntap	mdcntapbcb...rdus_vol01	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...rdus_vol02	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol116	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol121	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol205	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol206	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol207	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol208	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol209	mdcntap	NetApp	0.00	206.19

Data Dictionary

☐ **Select This Report**

Field	Description
Storage	Name of the storage device monitored by OCI.
Vendor	Name of the vendor associated with the storage device monitored by OCI.
Name	Name of the Volume or Internal Volume (Flexvol) associated with the storage device monitored by OCI.
Capacity Total (GB)	Usable capacity in TB as reported by the storage pool or aggregate.
IOpS Total (IO/s)	Measures the total number of I/O service requests on the volume for the selected time period. Filter set to equal (0) Zero.

 Click on the report screen shot above to view an enlarged image.

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Orphaned Volumes - Storage at Rest

3h 24h 3d 7d 30d Custom

Edit: OFF Save

Volume Detail

Storage	Name	Storage	Vendor	IOPS - Total (IO/s)	Capacity - Total (GB)
mdcntapbcbsa-3(155)		mdcntap	NetApp	0.00	97,367.49
mdcntap	mdcntapbcb...vdi_dev_os	mdcntap	NetApp	0.00	1,374.00
mdcntap	mdcntapbcb...v01nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...ATESP_BLOB	mdcntap	NetApp	0.00	100.00
mdcntap	mdcntapbcb...SHAREPOINT	mdcntap	NetApp	0.00	600.00
mdcntap	mdcntapbcb...SP_SHRBLOB	mdcntap	NetApp	0.00	50.00
mdcntap	mdcntapbcb..._mqmi_test	mdcntap	NetApp	0.00	10.00
mdcntap	mdcntapbcb...v04nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...v05nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...qmlogs_dev	mdcntap	NetApp	0.00	6.00
mdcntap	mdcntapbcb...rdus_vol01	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...rdus_vol02	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol116	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol121	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol205	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol206	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol207	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol208	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol209	mdcntap	NetApp	0.00	206.19

317 items found in 6 groups

 Click on the screen shot above to return to the report description.

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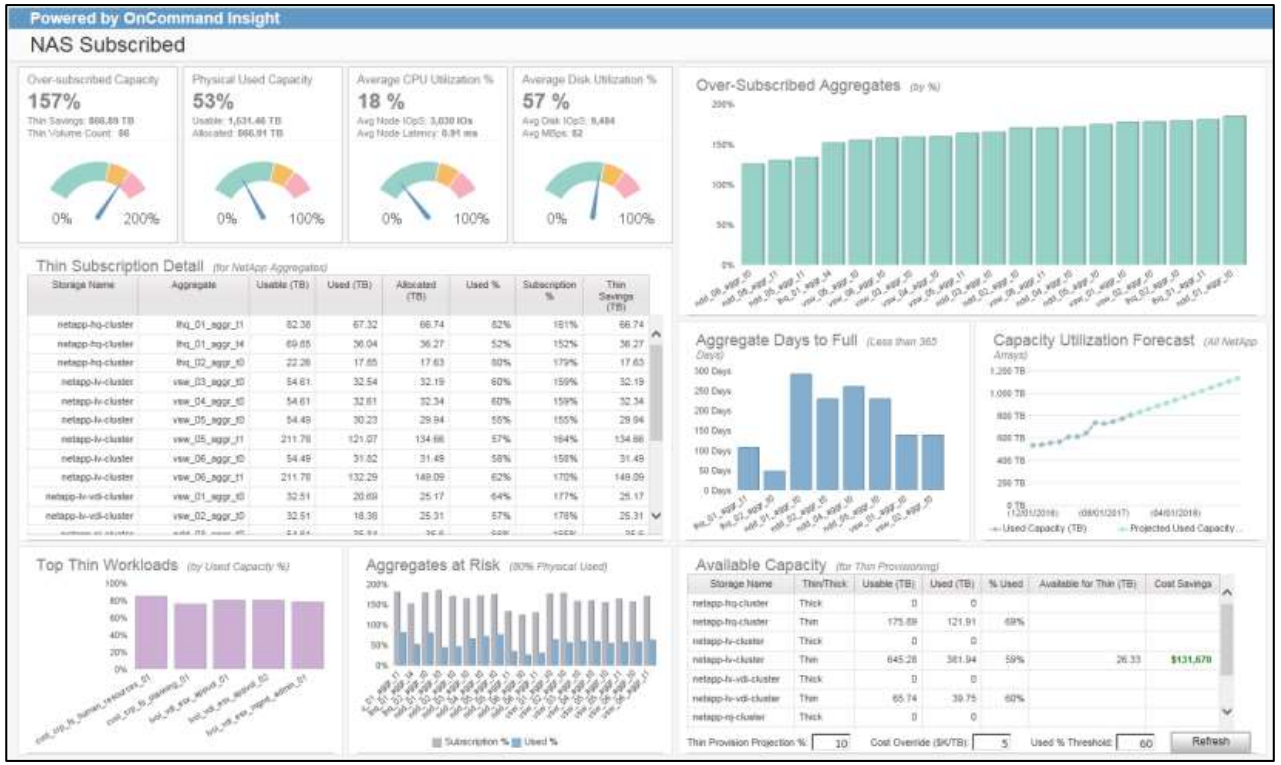
2.20 NAS Subscribed (Page 1 of 2)

Description: This dashboard shows primarily NAS Subscribed Capacity (or Thin Provisioned) and some utilization metrics for CPU and Disk. The objective of this report is to show areas of risk for thin provisioned capacity, comparing physical used capacity with over-subscription %. There is also a container which provides an Available Capacity calculator for thin provisioning.

Prerequisites: Annotations/definitions are necessary for cost and Application. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

See next page

 Click on the report screen shot above to view an enlarged image.

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2.20 NAS Subscribed (Page 2 of 2)

Field	Description
Storage Name	Name of the storage device monitored by OCI.
Aggregate Name	Name of the aggregate associated with the storage device monitored by OCI.
Thin/Thick	Provisioned capacity flag indicating whether capacity in the aggregate is available for thin or thick provisioning.
Workloads/Applications	OCI configured annotation. Defines the Application associated with host or internal volume capacity.
Over-Subscribed Capacity %	Allocated (TB) divided by Usable (TB).
Physical Used Capacity %	Used (TB) divided by Usable (TB).
Average CPU Utilization %	Average CPU Utilization reported by the NetApp Controller (Node), averaged hourly for 14 days.
Average Disk Utilization %	Average Disk Utilization reported by the disks that support the aggregate, averaged hourly for 14 days.
Usable (TB)	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Used (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Allocated (TB)	Internal Volume Allocated (TB)
Used %	Same as Physical Used Capacity %

Data Dictionary

☐ **Select This Report**

Field	Description
Subscription %	Same as Over-Subscribed Capacity
Thin Savings (TB)	IF([Subscription %]>1) THEN (([Subscription %]-1)*[Capacity (TB)]) ELSE (0).
Used Capacity (TB)	Same as Used (TB).
Projected Used Capacity (TB)	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Available for Thin (TB)	IF([Thin/Thick]='Thin' AND [% Used] < (Used % Threshold / 100) THEN (((Thin Provision Projection %/100)*([Usable (TB)]-[Used (TB)])) ELSE (null)
Thin Provision Projection %	User prompt defined by the parameter 'sThin' and defaulting to 10%.
Cost Override ($K/TB)	User prompt defined by the parameter 'sThinCost' and defaulting to 5. The value defines the storage cost to be $5,000 dollars per TB of capacity. This value will vary sharply.
Used % Threshold	User prompt defined by the parameter 'sTop' and defaulting to 60%. This threshold constrains the amount of capacity that is available for thin provisioning.
Variable Cost	IF (Cost Override ($K/TB)>0) THEN(Cost Override ($K/TB)) ELSE ([Cost]).
Cost	OCI configured annotation. Defines cost per GB per storage tier or Service Level.
Cost Savings	Cost Override ($K/TB)
Days to Full	The number of days (364 or less) that the storage pool is reporting (using linear regression formula) when the pool will be 100% full.

See previous page

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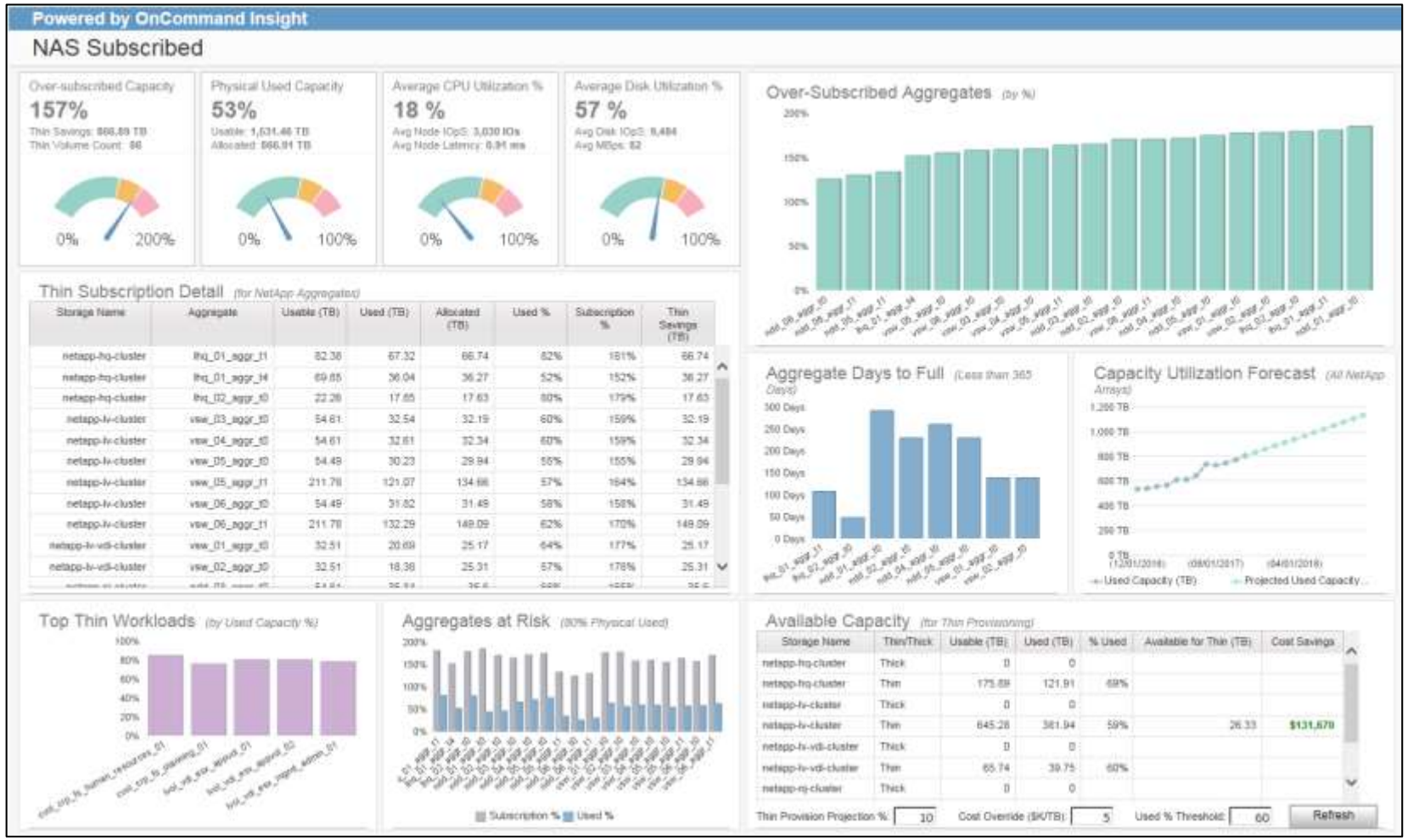
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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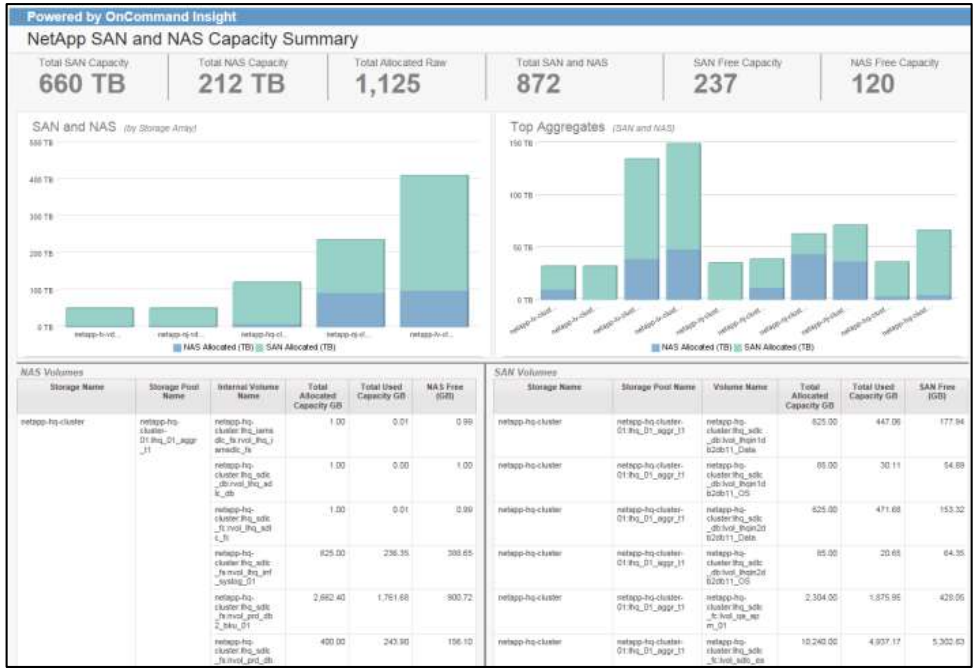
2.21 NetApp SAN and NAS Capacity Summary

Description: This report shows a NetApp Capacity Summary for both SAN and NAS. On the top it summarizes Capacity (Raw, Total, Free), SAN and NAS Allocated by array, and Top Aggregates for SAN and NAS. On the bottom are 2 lists showing detailed information for both NAS Volumes and SAN Volumes.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Array	Name of the storage device monitored by OCI.
Aggregates/Storage Pool Name	Name of the aggregate associated with the storage device monitored by OCI.
Volume Name	Name of the SAN Volume or LUN. For this report, the LUN is part of a FlexVol carved from an aggregate.
Internal Volume Name	Name of the Internal Volume or FlexVol. The Internal Volume usually contains an NFS or CIFS share.
Total SAN Capacity TB	Capacity allocated to the Internal Volume which IS a LUN.
Total NAS Capacity TB	Capacity allocated to the Internal Volume which is NOT a LUN.
Total Allocated Raw	Pre-RAID raw capacity in TB as reported by the Storage Array monitored by OCI and contained in the Storage and Storage Pool Capacity Fact table.
Total SAN and NAS	Total SAN Capacity TB + Total NAS Capacity TB
SAN Free Capacity	For Flexvols provisioned as a LUN, Total Allocated Capacity GB –Total Used Capacity GB. For LUN's, Total Used will equal Total Allocated when NOT thin provisioned.
NAS Free Capacity	For Flexvols NOT provisioned as a LUN, Total Allocated Capacity GB –Total Used Capacity GB. If Space Guarantee is enabled, then Total Used Capacity GB will equal Total Allocated Capacity GB.
Total Allocated Capacity GB	Total Allocated capacity in GB for the Internal Volume whether or not it's a LUN.
Total Used Capacity GB	Total data files written in GB to the Internal Volume if NOT a LUN and Space Guarantee is DISABLED. For LUN's, Total Used will equal Total Allocated when NOT thin provisioned.
NAS Free GB	Same as NAS Free Capacity.
SAN Free GB	Same as SAN Free Capacity.

 Click on the report screen shot above to view an enlarged image.

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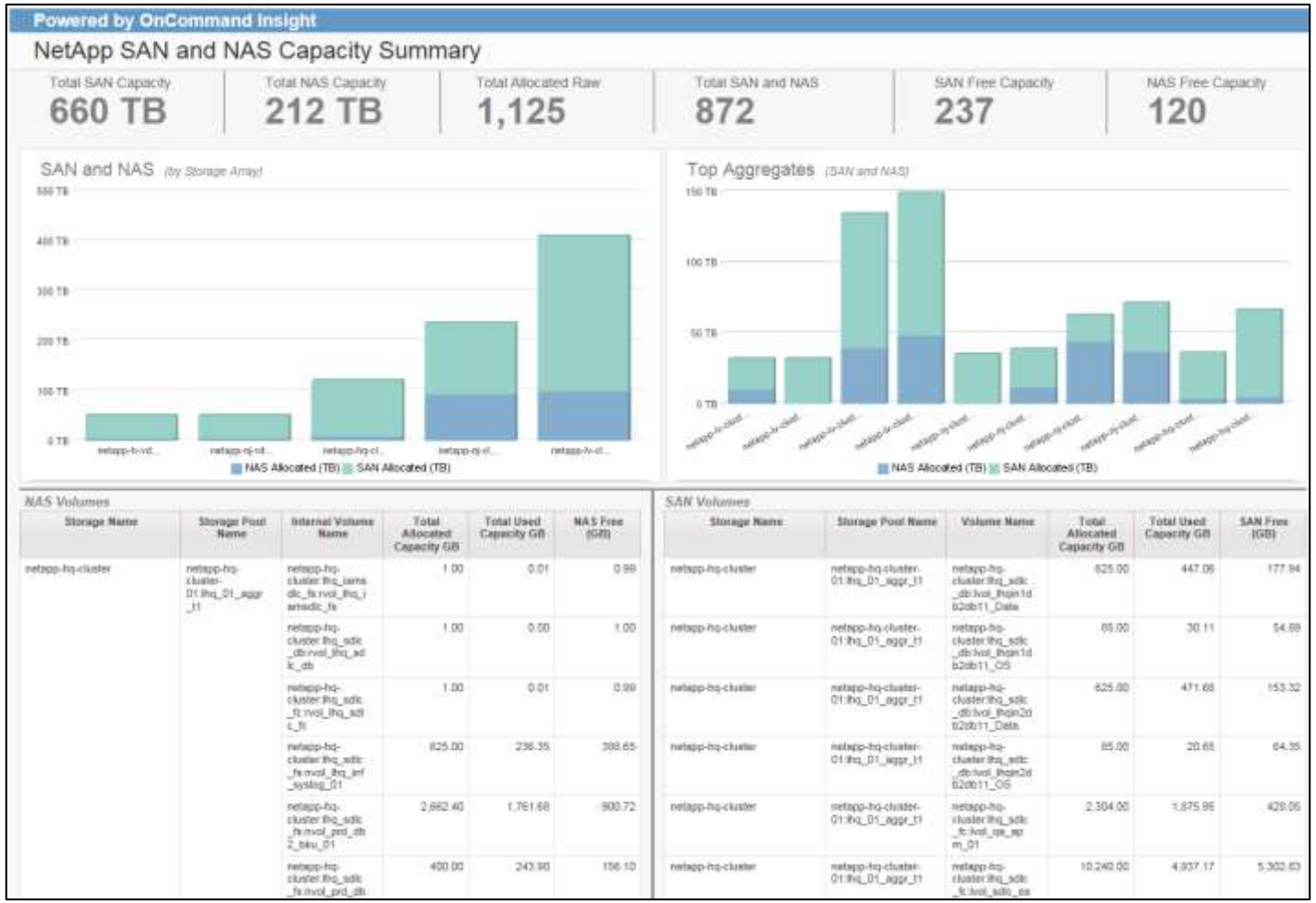
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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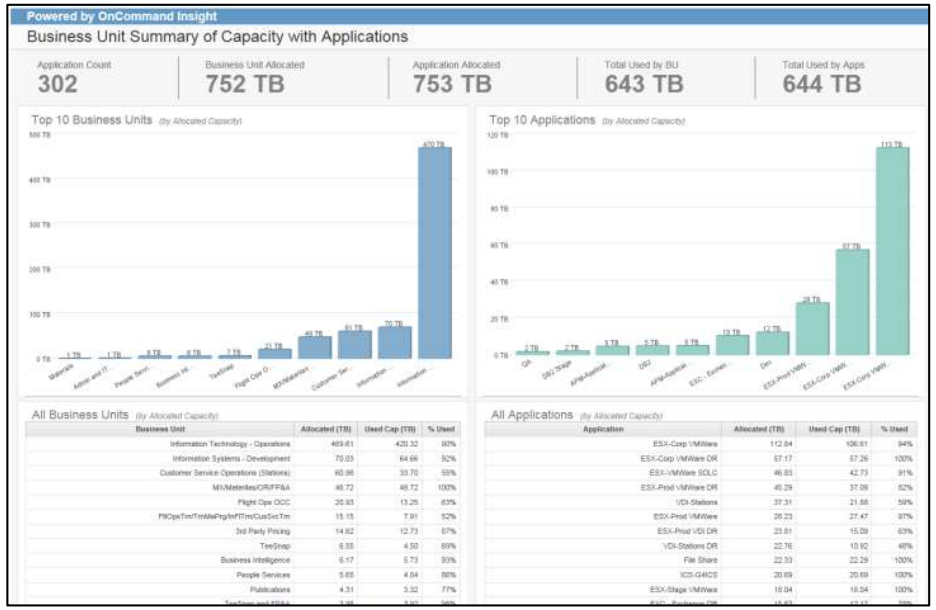
2.22 Business Unit Summary of Capacity with Applications

Description: This dashboard presents a Business Unit Summary of Capacity with Applications. The top two charts show Top 10 Business Units by Allocated Capacity and Top 10 Applications by Allocated Capacity. The two lists on the bottom provide detail, sorted by Application and displaying Business Unit, Application, Allocated, Used, and percent Used. The lists on the right shows essentially the same.

Prerequisites: Annotations/definitions are necessary for Applications and Business Unit. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Application	OCI configured annotation. Defines the Application associated with host or internal volume capacity.
Business Unit	OCI configured annotation. Defines the Business Unit associated with the Application.
Business Unit Allocated TB	Internal Volume or Volume/LUN capacity allocated to host initiators that are annotated with Business Unit.
Application Allocated TB	Internal Volume or Volume/LUN capacity allocated to host initiators that are annotated with Application.
Total Used by BU	For Internal Volumes that are not LUNS and with Space Guarantee disabled, this is written capacity grouped by Business Unit. For Internal Volumes with Space Guarantee enabled and for LUNs, used capacity will be equal to allocated.
Total Used by Apps	For Internal Volumes that are not LUNS and with Space Guarantee disabled, this is written capacity grouped by Application. For Internal Volumes with Space Guarantee enabled and for LUNs, used capacity will be equal to allocated.
Allocated (TB)	Same as Business Unit or Application Allocated TB.
Used Cap (TB)	Same as Business Unit or Application Used TB.
% Used	Used Cap (TB) / Allocated (TB).

 Click on the report screen shot above to view an enlarged image.

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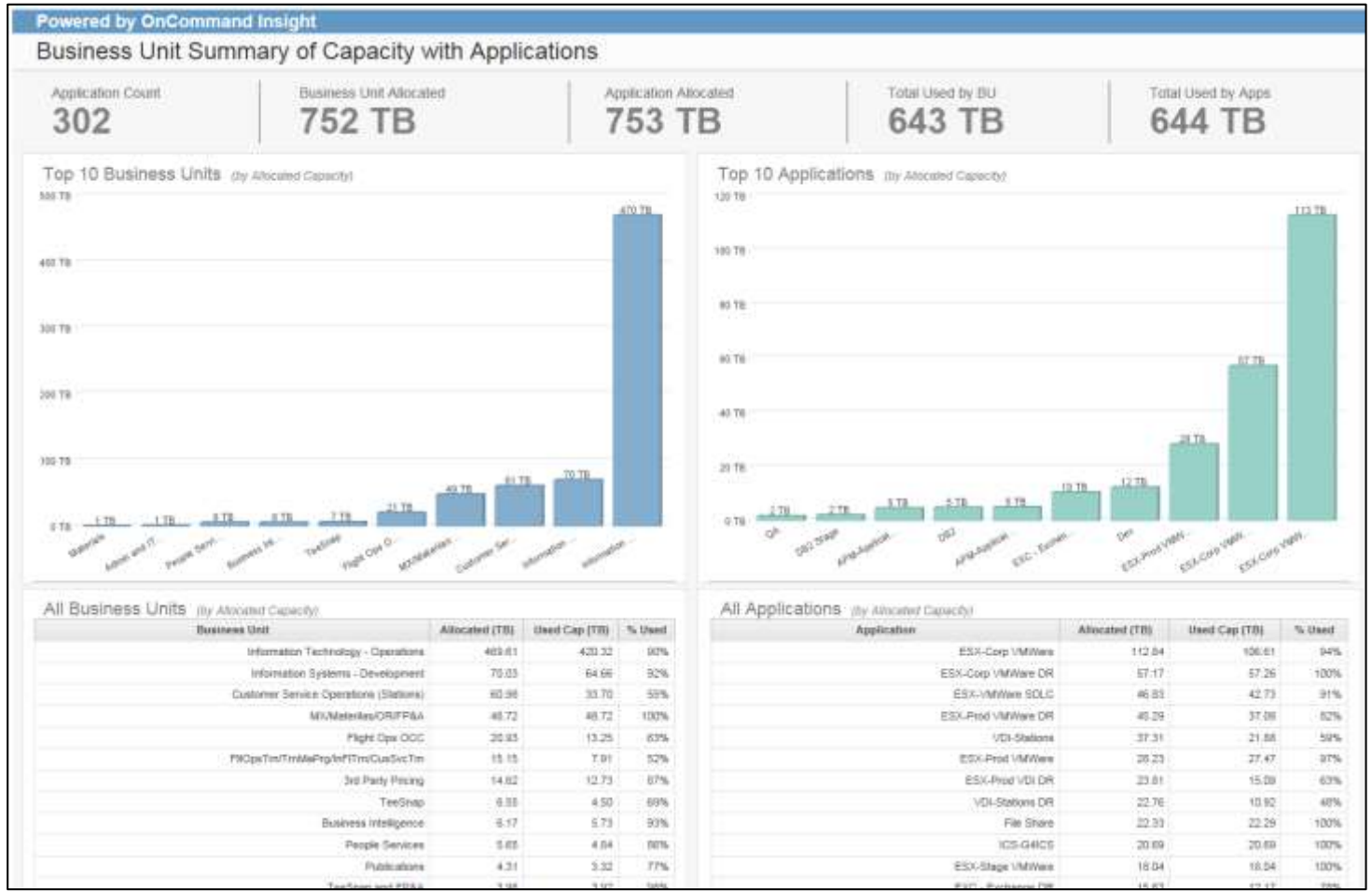
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



 Click on the screen shot above to return to the report description.

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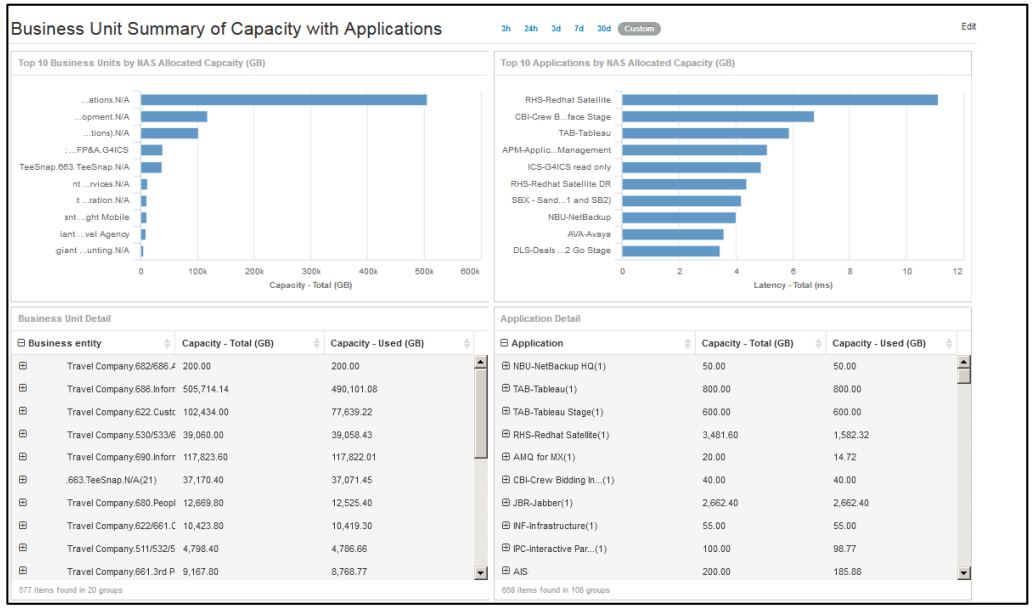
2.22 WebUI – Business Unit Summary of Capacity with Applications

Description: This WebUI based dashboard shows Top 10 Applications and Business Units by Allocated Capacity and Used Capacity. A detailed list of all devices associated with Applications and Business Units with Capacity metrics is also available.

Prerequisites: Annotations/definitions are necessary for Applications and Business Units. Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Application	OCI configured annotation. Defines the Application associated with host or internal volume capacity.
Business Unit	OCI configured annotation. Defines the Business Unit associated with the Application.
Capacity – Total (GB)	Internal Volume or Volume/LUN capacity allocated to host initiators that are annotated with Business Unit or Application.
Capacity – Used (GB)	For Internal Volumes that are not LUNS and with Space Guarantee disabled, this is written capacity grouped by Application or Business Unit. For Internal Volumes with Space Guarantee enabled and for LUNs, used capacity will be equal to allocated.

 Click on the report screen shot above to view an enlarged image.

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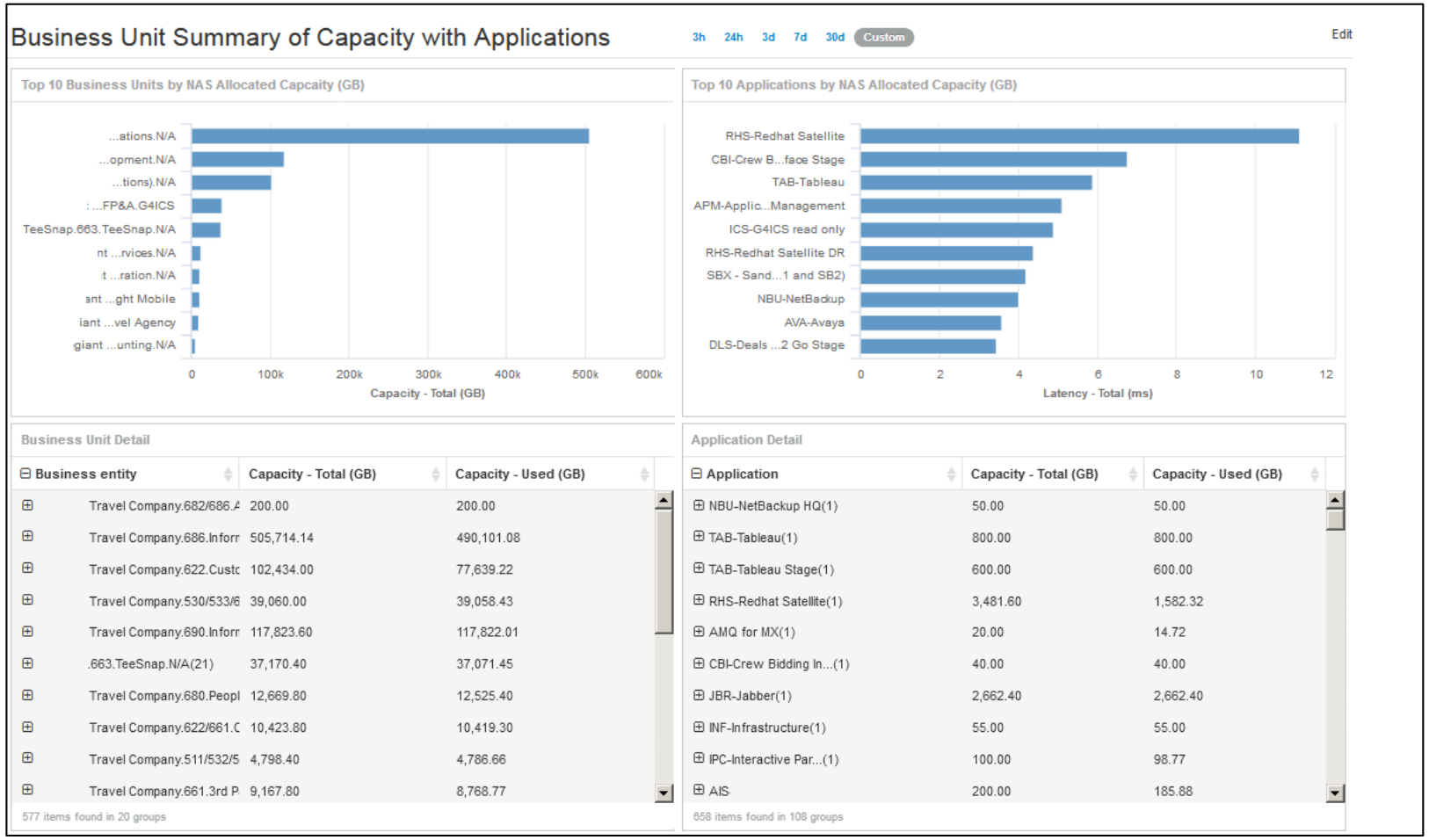
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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2.23 Capacity Changes and Growth

Description: This report shows Capacity Changes and Growth for Storage Arrays. On the left is a list of Storage Inventory. From left to right the report shows Beginning Months Used Capacity; Current Months Used Capacity; and then shows a plus/minus difference by percent over a 12 month period. A chart on the right depicts Storage Growth over a 12 Month Period.

Prerequisites: This is available for OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the storage device monitored by OCI.
Date	Fulldate field available in the DWH Date Dimension table.
Diff +/-	This is the running-difference of Used capacity in TB for the past 12 months.
Current Used (TB)	Current Used Capacity (TB) as of the last OCI collection interval and DWH ETL Build.
Begin Used (TB)	Used Capacity (TB) collected by OCI 365 days ago.
Used Capacity (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Overall Change Differential	This is the change in capacity +/- for all storage arrays monitored by OCI for the past 12 months.
Overall Growth Rate	This is the simple growth rate for all storage arrays monitored by OCI. Current Used (TB) – Begin Used (TB) / 12 months.

 Click on the report screen shot above to view an enlarged image.

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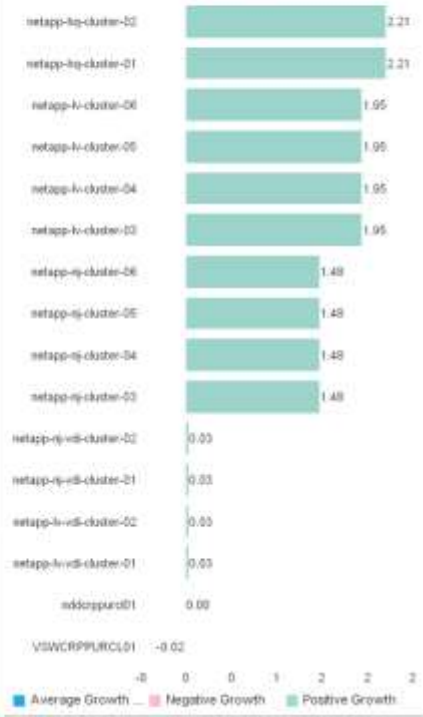
Capacity Changes and Growth

Beginning Used Capacity (12 Months ago)	Current Used Capacity	Overall Change Differential	Overall Growth Rate (Monthly - Last 12 Months)
727 TB	813 TB	+85.85 TB	+7.15 TB

Storage Inventory *(Growth Differential per Month)*

Storage Name	Begin Used (TB)	Current Used (TB)	Dec 2016 Diff +/-	Jan 2017 Diff +/-	Feb 2017 Diff +/-	Mar 2017 Diff +/-	Apr 2017 Diff +/-	May 2017 Diff +/-	Jun 2017 Diff +/-	Jul 2017 Diff +/-	Aug 2017 Diff +/-	Sep 2017 Diff +/-	Oct 2017 Diff +/-	Nov 2017 Diff +/-
nddcrppurcl01	0.09	0.09	0	0	0.02	0.03	0	0.01	0.01	0.01	0	0	0.01	0
netapp-hq-cluster-01	77.13	103.7	0	0.36	3.53	2.34	6.29	-0.98	5.01	0.05	9.16	11.69	9.17	-7.24
netapp-hq-cluster-02	77.13	103.7	0	-0.01	0.1	0.05	0.56	10.55	0.02	0	0.5	0.02	0.06	-0.6
netapp-lv-cluster-03	141.07	164.46	0	0.35	0.52	0.21	3.05	-1.7	0	-0.03	0.02	0.01	9.17	-4.93
netapp-lv-cluster-04	141.07	164.46	0	-0.01	0.03	0	0	-1.06	2.27	0	0	0	0.22	5.08
netapp-lv-cluster-05	141.07	164.46	0	-1.36	4.27	1.82	7.71	3.15	1.19	10.56	2.46	5.47	5.09	-10.43
netapp-lv-cluster-06	141.07	164.46	0	2.11	-1.62	0.98	7.63	-3.42	1.5	10.82	0.85	-2.88	1.19	24.33
netapp-lv-vdi-cluster-01	20.69	21.03	0	0	0	0	0	0	0	16.51	0.08	0.03	0.02	4.05
netapp-lv-vdi-cluster-02	20.69	21.03	0	0	0	0	0	0	0	16.32	1.32	0.05	0.05	0.65
netapp-nj-cluster-03	74.45	92.16	0	0	0	0.14	4.76	-1.32	10.06	-5.56	0.02	0.01	0	0.01
netapp-nj-cluster-04	74.45	92.16	0	0.35	0.47	0.2	0.53	4.13	2.25	5.6	0	0	0	0.16
netapp-nj-cluster-05	74.45	92.16	0	4.2	3.67	2.6	0.19	0.43	7.38	10.72	-13.93	1.68	0	11.47
netapp-nj-cluster-06	74.45	92.16	0	0	5.22	0	11.06	0.59	0.49	0.1	-9.45	2.21	-0.01	10.98
netapp-nj-vdi-cluster-01	15.21	15.55	0	0	0	0	0	0	0	12.95	0.11	0.07	0.02	0.1
netapp-nj-vdi-cluster-02	15.21	15.55	0	0	0	0	0	0	0	12.93	1.33	0.02	0.01	0.02
VSWCRPPURCL01	1.11	0.92	0	0.01	0.04	0.02	0	0.01	0.03	0.15	0.28	0.26	0.31	-0.19

Storage Growth Rates *(Last 12 Months)*



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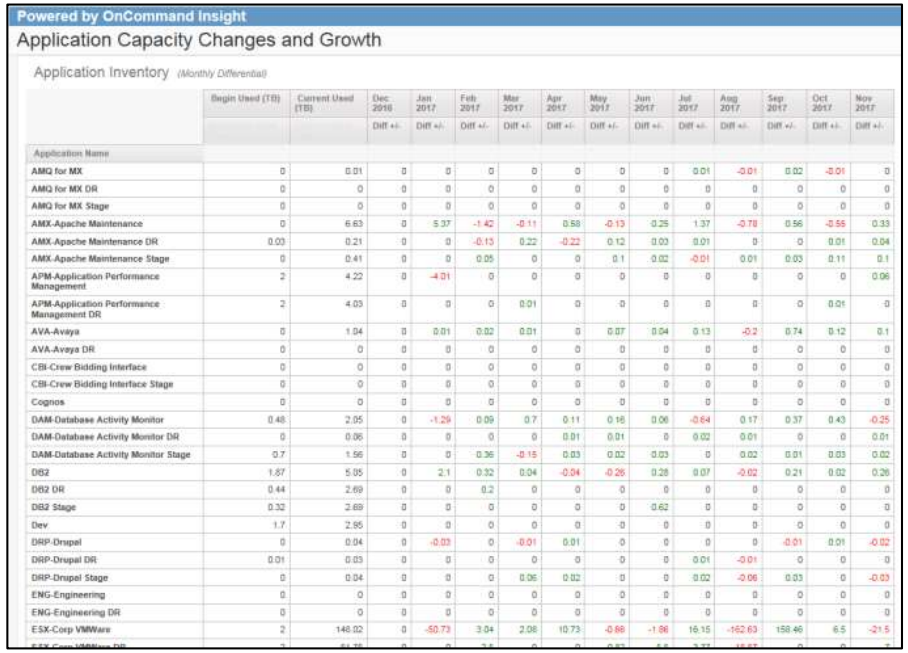
2.23 Application Capacity Changes and Growth

Description: This report shows Capacity Changes and Growth for Applications. On the left is a list of Application Inventory. From left to right the report shows Beginning Months Used Capacity; Current Months Used Capacity; and then shows a plus/minus difference by percent over a 12-month period.

Prerequisites: Annotations/definitions are necessary for Applications. This is available for OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover and Plan.



Application Name	Begin Used (TB)	Current Used (TB)	Dec 2016 Diff +/-	Jan 2017 Diff +/-	Feb 2017 Diff +/-	Mar 2017 Diff +/-	Apr 2017 Diff +/-	May 2017 Diff +/-	Jun 2017 Diff +/-	Jul 2017 Diff +/-	Aug 2017 Diff +/-	Sep 2017 Diff +/-	Oct 2017 Diff +/-	Nov 2017 Diff +/-
AMQ for MX	0	0.01	0	0	0	0	0	0	0	0.01	-0.01	0.02	-0.01	0
AMQ for MX DR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AMQ for MX Stage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AMX-Apache Maintenance	0	6.63	0	5.37	-1.42	-0.11	0.58	-0.13	0.25	1.37	-0.78	0.56	-0.55	0.33
AMX-Apache Maintenance DR	0.03	0.21	0	0	-0.13	0.22	-0.22	0.12	0.03	0.01	0	0	0.01	0.04
AMX-Apache Maintenance Stage	0	0.41	0	0	0.05	0	0	0.1	0.02	-0.01	0.01	0.03	0.11	0.1
APM-Application Performance Management	2	4.22	0	-4.01	0	0	0	0	0	0	0	0	0	0.06
APM-Application Performance Management DR	2	4.03	0	0	0	0.01	0	0	0	0	0	0	0.01	0
AVA-Avaya	0	1.04	0	0.01	0.02	0.01	0	0.07	0.04	0.13	-0.2	0.74	0.12	0.1
AVA-Avaya DR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CBI-Crew Bidding Interface	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CBI-Crew Bidding Interface Stage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cognos	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAM-Database Activity Monitor	0.48	2.05	0	-1.29	0.09	0.7	0.11	0.16	0.06	-0.64	0.17	0.37	0.43	-0.25
DAM-Database Activity Monitor DR	0	0.06	0	0	0	0	0.01	0.01	0	0.02	0.01	0	0	0.01
DAM-Database Activity Monitor Stage	0.7	1.56	0	0	0.36	-0.15	0.03	0.02	0.03	0	0.02	0.01	0.03	0.02
DB2	1.87	5.05	0	2.1	0.32	0.04	-0.04	-0.26	0.28	0.07	-0.02	0.21	0.02	0.26
DB2 DR	0.44	2.69	0	0	0.2	0	0	0	0	0	0	0	0	0
DB2 Stage	0.32	2.69	0	0	0	0	0	0	0.62	0	0	0	0	0
Dev	1.7	2.95	0	0	0	0	0	0	0	0	0	0	0	0
DRP-Drupal	0	0.04	0	-0.03	0	-0.01	0.01	0	0	0	0	-0.01	0.01	-0.02
DRP-Drupal DR	0.01	0.03	0	0	0	0	0	0	0	0.01	-0.01	0	0	0
DRP-Drupal Stage	0	0.04	0	0	0	0.06	0.02	0	0	0.02	-0.06	0.03	0	-0.03
ENG-Engineering	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENG-Engineering DR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESX-Corp VMWare	2	148.02	0	-50.73	3.04	2.08	10.73	-0.68	-1.86	16.15	-162.63	158.46	6.5	-21.5

Data Dictionary

☐ **Select This Report**

Field	Description
Application	OCI configured annotation. Defines the Application associated with host or internal volume capacity.
Date	Fulldate field available in the DWH Date Dimension table.
Diff +/-	This is the running-difference of Used capacity in TB for the past 12 months.
Current Used (TB)	Current Used Capacity (TB) as of the last OCI collection interval and DWH ETL Build.
Begin Used (TB)	Used Capacity (TB) collected by OCI 365 days ago.
Used Capacity (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.

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Application Capacity Changes and Growth

Application Inventory *(Monthly Differential)*

Application Name	Begin Used (TB)	Current Used (TB)	Dec 2016 Diff +/-	Jan 2017 Diff +/-	Feb 2017 Diff +/-	Mar 2017 Diff +/-	Apr 2017 Diff +/-	May 2017 Diff +/-	Jun 2017 Diff +/-	Jul 2017 Diff +/-	Aug 2017 Diff +/-	Sep 2017 Diff +/-	Oct 2017 Diff +/-	Nov 2017 Diff +/-
AMQ for MX	0	0.01	0	0	0	0	0	0	0	0.01	-0.01	0.02	-0.01	0
AMQ for MX DR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AMQ for MX Stage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AMX-Apache Maintenance	0	6.63	0	5.37	-1.42	-0.11	0.58	-0.13	0.25	1.37	-0.78	0.56	-0.55	0.33
AMX-Apache Maintenance DR	0.03	0.21	0	0	-0.13	0.22	-0.22	0.12	0.03	0.01	0	0	0.01	0.04
AMX-Apache Maintenance Stage	0	0.41	0	0	0.05	0	0	0.1	0.02	-0.01	0.01	0.03	0.11	0.1
APM-Application Performance Management	2	4.22	0	-4.01	0	0	0	0	0	0	0	0	0	0.06
APM-Application Performance Management DR	2	4.03	0	0	0	0.01	0	0	0	0	0	0	0.01	0
AVA-Avaya	0	1.04	0	0.01	0.02	0.01	0	0.07	0.04	0.13	-0.2	0.74	0.12	0.1
AVA-Avaya DR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CBI-Crew Bidding Interface	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CBI-Crew Bidding Interface Stage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cognos	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAM-Database Activity Monitor	0.48	2.05	0	-1.29	0.09	0.7	0.11	0.16	0.06	-0.64	0.17	0.37	0.43	-0.25
DAM-Database Activity Monitor DR	0	0.06	0	0	0	0	0.01	0.01	0	0.02	0.01	0	0	0.01
DAM-Database Activity Monitor Stage	0.7	1.56	0	0	0.36	-0.15	0.03	0.02	0.03	0	0.02	0.01	0.03	0.02
DB2	1.87	5.05	0	2.1	0.32	0.04	-0.04	-0.26	0.28	0.07	-0.02	0.21	0.02	0.26
DB2 DR	0.44	2.69	0	0	0.2	0	0	0	0	0	0	0	0	0
DB2 Stage	0.32	2.69	0	0	0	0	0	0	0.62	0	0	0	0	0
Dev	1.7	2.85	0	0	0	0	0	0	0	0	0	0	0	0
DRP-Drupal	0	0.04	0	-0.03	0	-0.01	0.01	0	0	0	0	-0.01	0.01	-0.02
DRP-Drupal DR	0.01	0.03	0	0	0	0	0	0	0	0.01	-0.01	0	0	0
DRP-Drupal Stage	0	0.04	0	0	0	0.06	0.02	0	0	0.02	-0.06	0.03	0	-0.03
ENG-Engineering	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENG-Engineering DR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESX-Corp VMWare	2	148.02	0	-50.73	3.04	2.08	10.73	-0.88	-1.86	16.15	-162.63	158.46	6.5	-21.5
ESX-Corp VMWare DR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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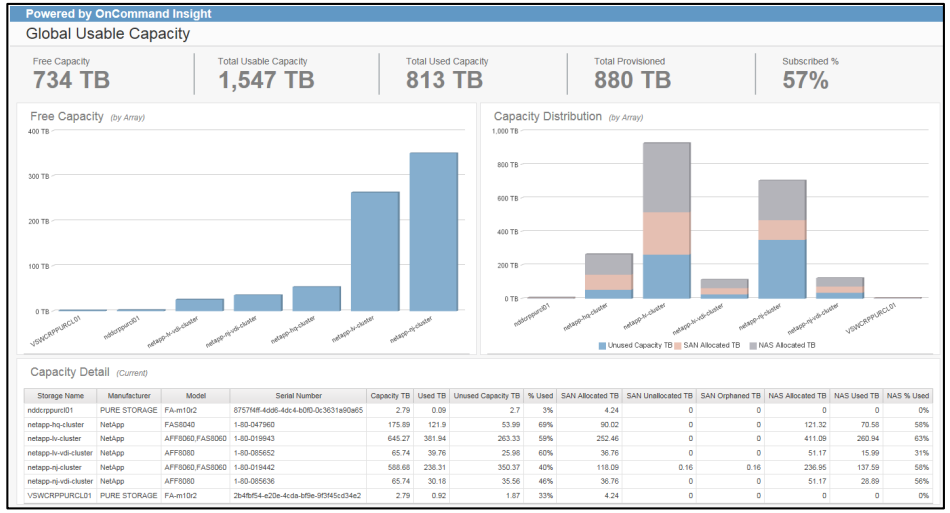
2.24 Global Usable Capacity

Description: Global Usable Capacity shows free capacity by storage array, capacity distribution by storage array and then a breakdown of capacity detail by storage array.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover and Plan.



Storage Name	Manufacturer	Model	Serial Number	Capacity TB	Used TB	Unused Capacity TB	% Used	SAN Allocated TB	SAN Unallocated TB	SAN Orphaned TB	NAS Allocated TB	NAS Used TB	NAS % Used
nddcrppurcl01	PURE STORAGE	FA-m10r2	87576fff-4dd6-4dc4-b0f0-0c3631a90a65	2.79	0.09	2.7	3%	4.24	0	0	0	0	0%
netapp-hq-cluster	NetApp	FAS8040	1-80-047960	175.89	121.9	53.99	69%	90.02	0	0	121.32	70.58	58%
netapp-lv-cluster	NetApp	AFF8060,FAS8060	1-80-019943	645.27	381.94	263.33	59%	252.46	0	0	411.09	260.94	63%
netapp-lv-vdi-cluster	NetApp	AFF8080	1-80-085652	65.74	39.76	25.98	60%	36.76	0	0	51.17	15.99	31%
netapp-nj-cluster	NetApp	AFF8060,FAS8060	1-80-019442	588.68	238.31	350.37	40%	118.09	0.16	0.16	236.95	137.59	58%
netapp-nj-vdi-cluster	NetApp	AFF8080	1-80-085636	65.74	30.18	35.56	46%	36.76	0	0	51.17	28.89	56%
VSWCRPPURCL01	PURE STORAGE	FA-m10r2	2b4fbf54-e20e-4cda-bf9e-9f3f45cd34e2	2.79	0.92	1.87	33%	4.24	0	0	0	0	0%

Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the storage device monitored by OCI.
Manufacturer	Vendor name associated with the storage device monitored by OCI.
Model	Model name associated with the storage device monitored by OCI.
Serial Number	Serial Number associated with the storage device monitored by OCI.
Capacity TB	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Used TB	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned then Used = Allocated.
Unused Capacity TB	Used TB – Capacity TB
% Used	Used TB / Capacity TB
SAN Allocated TB	Volume Allocated capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
SAN UnAllocated TB	Volume UnAllocated capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Masked Volume Capacity TB	Volume capacity that is masked to storage initiators as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
SAN Orphaned TB	Volume Allocated TB – Masked Volume Capacity TB
NAS Allocated TB	Internal Volume Allocated capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
NAS Used TB	Internal Volume Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. IF Space Guarantee is ENABLED, then Used will equal Allocated.
NAS % Used	NAS Used TB / NAS Allocated TB
Free Capacity TB	Same as Unused Capacity TB.
Total Usable Capacity TB	Same as Capacity TB.
Total Used Capacity TB	Same as Used TB.
Total Provisioned TB	SAN Allocated TB + NAS Allocated TB
Subscribed %	Total Provisioned TB / Capacity TB

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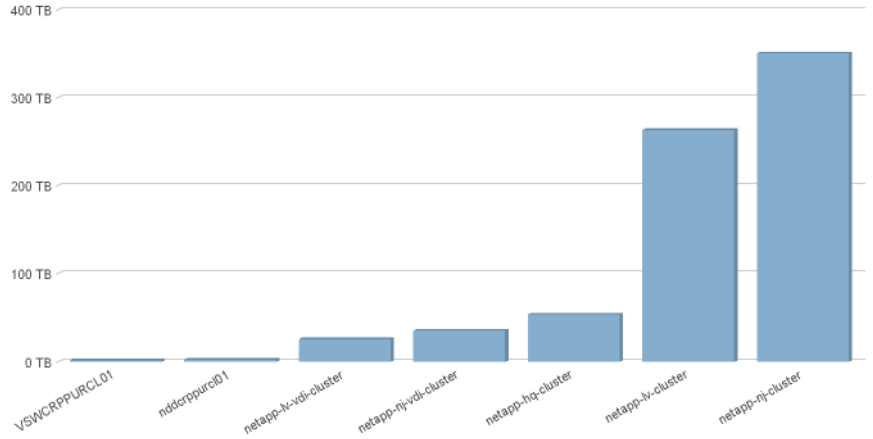
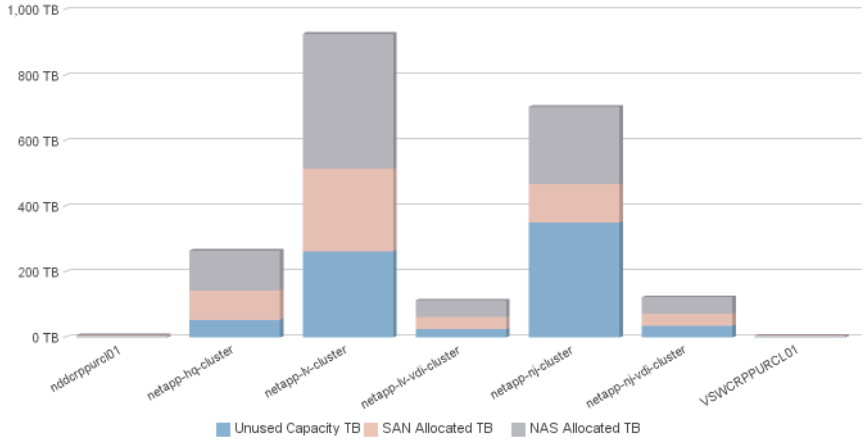
Global Usable Capacity

Free Capacity	Total Usable Capacity	Total Used Capacity	Total Provisioned	Subscribed %
734 TB	1,547 TB	813 TB	880 TB	57%

Free Capacity *(by Array)*



Capacity Distribution *(by Array)*



Capacity Detail *(Current)*

Storage Name	Manufacturer	Model	Serial Number	Capacity TB	Used TB	Unused Capacity TB	% Used	SAN Allocated TB	SAN Unallocated TB	SAN Orphaned TB	NAS Allocated TB	NAS Used TB	NAS % Used
nddcrppurcl01	PURE STORAGE	FA-m10r2	8757f4ff-4dd6-4dc4-b0f0-0c3631a90a65	2.79	0.09	2.7	3%	4.24	0	0	0	0	0%
netapp-hq-cluster	NetApp	FAS8040	1-80-047960	175.89	121.9	53.99	69%	90.02	0	0	121.32	70.58	58%
netapp-lv-cluster	NetApp	AFF8060,FAS8060	1-80-019943	645.27	381.94	263.33	59%	252.46	0	0	411.09	260.94	63%
netapp-lv-vdi-cluster	NetApp	AFF8080	1-80-085652	65.74	39.76	25.98	60%	36.76	0	0	51.17	15.99	31%
netapp-nj-cluster	NetApp	AFF8060,FAS8060	1-80-019442	588.68	238.31	350.37	40%	118.09	0.16	0.16	236.95	137.59	58%
netapp-nj-vdi-cluster	NetApp	AFF8080	1-80-085636	65.74	30.18	35.56	46%	36.76	0	0	51.17	28.89	56%
VSWCRPPURCL01	PURE STORAGE	FA-m10r2	2b4fbf54-e20e-4cda-bf9e-9f3f45cd34e2	2.79	0.92	1.87	33%	4.24	0	0	0	0	0%

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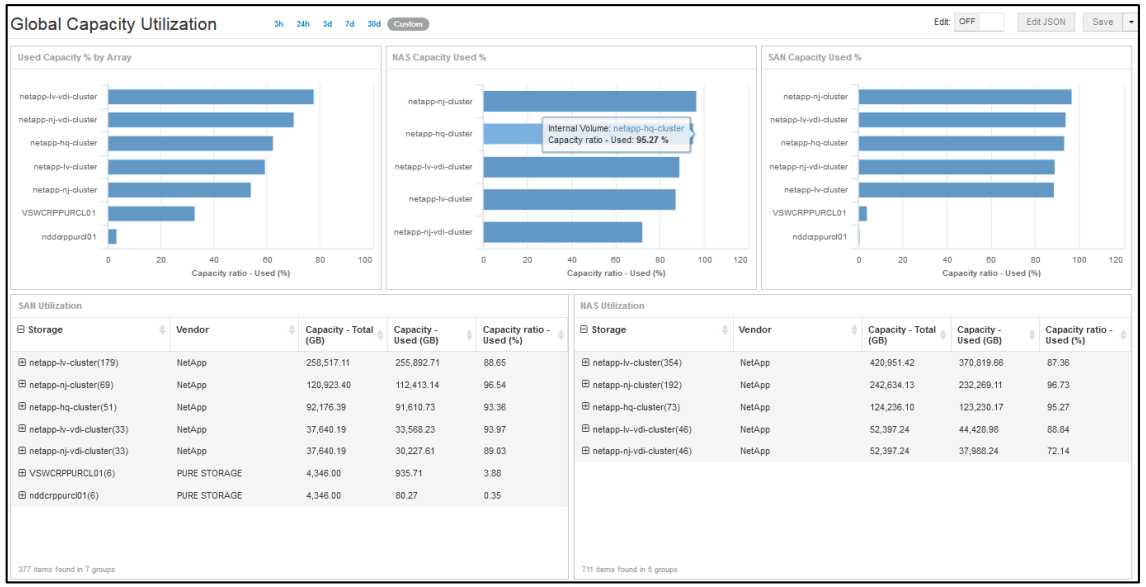
2.25 WebUI – Global Capacity Utilization

Description: This WebUI based dashboard shows Global Capacity Utilization by Array and Protocol. Top N devices are displayed with a detailed list for SAN and NAS Capacity breakdown.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage	Name of the storage device monitored by OCI.
Vendor	Vendor name associated with the storage device monitored by OCI.
Capacity – Total (GB)	Usable Capacity in (GB) as reported by the storage system monitored by OCI.
Capacity – Used (GB)	Used Capacity in (GB) as reported by the storage system monitored by OCI. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Capacity ratio-Used (%)	% of Capacity that is reported as Used.
NAS Protocol	Defined as Internal Volumes.
SAN Protocol	Defined as Volumes.

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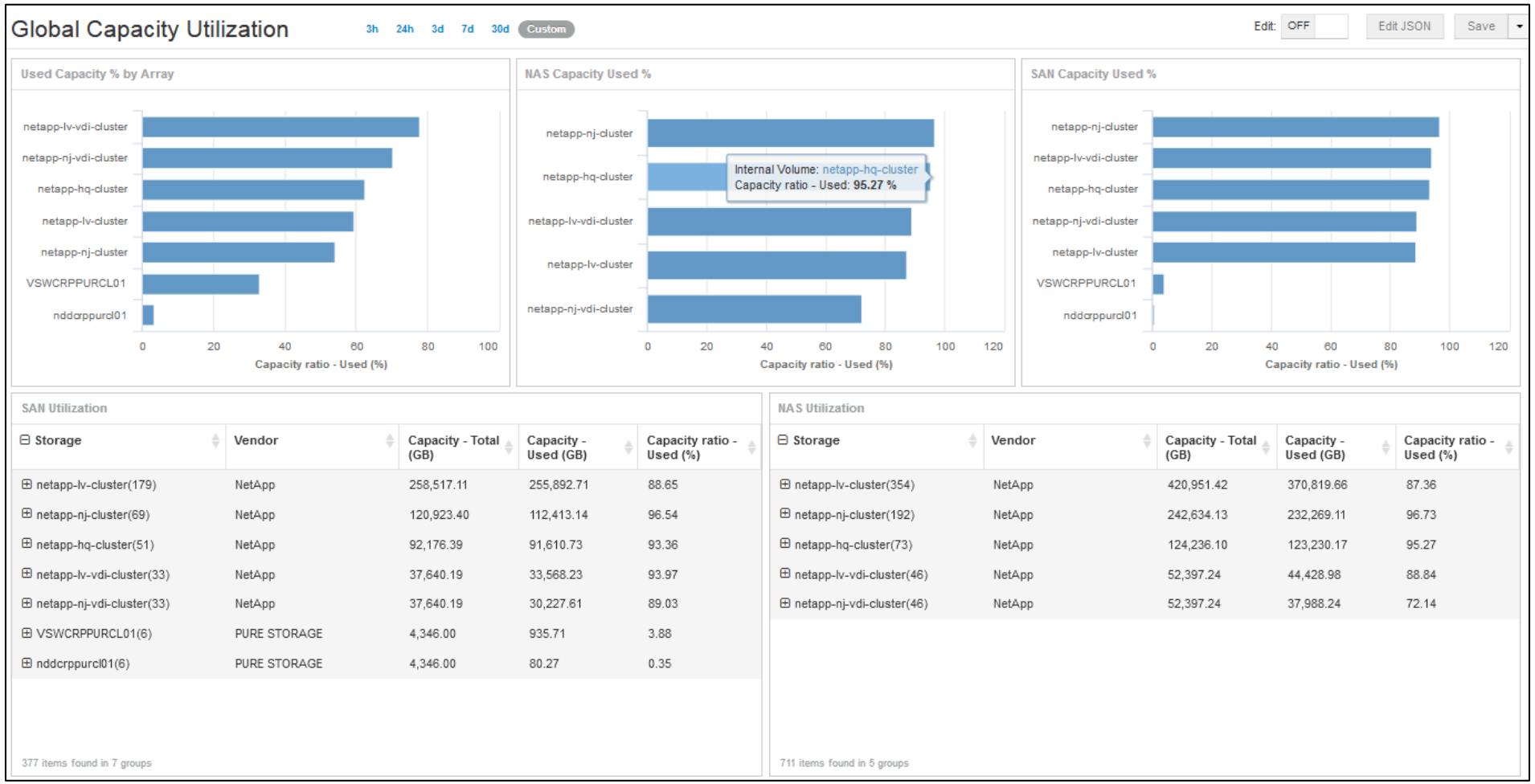
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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2.26 EMC Symmetrix Environment

Description: This EMC vendor centric dashboard created exclusively for Symmetrix Arrays shows capacity and performance metrics for all devices by default. A filter is provided to select one or more arrays known to OCI. Capacity Trends, VMAX Port Utilization, IOpS and Disk Utilization are visible using 14-day hourly performance metrics. The report is rounded out with Orphaned Capacity and Violations at the bottom.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

See next page

 Click on the report screen shot above to view an enlarged image.

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2.26 EMC Symmetrix Environment (Page 2 of 2)

Field	Description
Array	Name of the Symmetrix storage device monitored by OCI.
Violation Name	Violations e.g. Inconsistent LUNS, Missing Active Hosts Ports, Missing Redundancy, Path Outage, etc. as captured by SAN Path Policies configured in OCI.
Total Raw Capacity TB	Pre-RAID raw capacity in TB as reported by the Storage Array monitored by OCI and contained in the Storage and Storage Pool Capacity Fact table.
Total Usable Capacity TB	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Total Volume Capacity TB	Total SAN provisioned capacity in TB presented to host initiators.
Total Used Capacity TB	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
% Subscribed	Total Volume Capacity TB / Total Usable Capacity TB
Total Free Capacity	Total Usable Capacity TB – Total Used Capacity TB
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Capacity (TB)	Same as Total Usable Capacity TB.
Used (TB)	Same as Total Used Capacity TB.
Projected (TB)	Projected Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.

Data Dictionary

☐ **Select This Report**

Field	Description
Projected Used (TB)	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Avg Utilization	Average FA Port Utilization for EMC Symmetrix devices collected hourly for 14 days.
Peak Utilization	Peak FA Port Utilization for EMC Symmetrix devices collected hourly for 14 days.
Cache Hit %	Cache Hit Ratio as reported by the storage system cache collected hourly for 14 days.
Sum of Total IOpS	Sum of Total Volume IOpS (both Read and Write) averaged hourly for 14 days.
Latency (ms)	Average Volume Latency in milliseconds averaged hourly for 14 days.
Peak Latency (ms)	Peak Volume Latency in milliseconds averaged hourly for 14 days
Average Disk Utilization	Average Disk Utilization % reported by the disks that support storage pools or RAID Groups, averaged hourly for 14 days.
Peak Disk Utilization	Peak Disk Utilization % reported by the disks that support storage pools or RAID Groups, averaged hourly for 14 days.
Orphaned Capacity GB	Capacity that is allocated but not mapped or masked to host initiators. This metric is reported by the volume_history_capacity_fact table in the DWH.

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Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption

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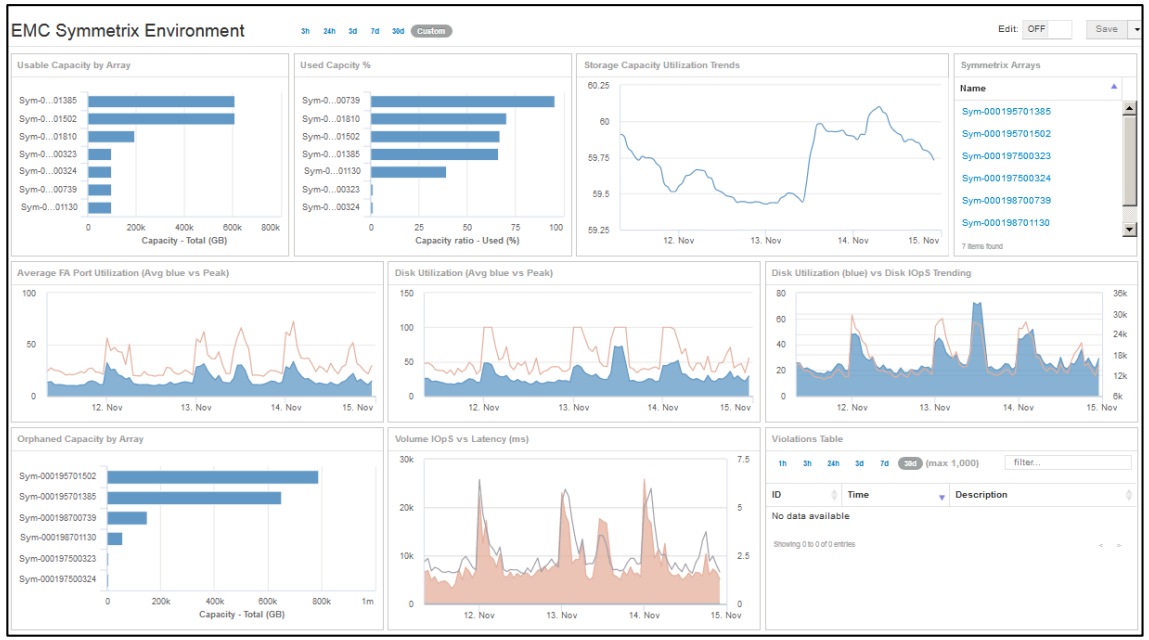
2.26 WebUI – EMC Symmetrix Environment

Description: This WebUI based dashboard shows EMC Symmetrix Capacity and Performance metrics.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Symmetrix Arrays	Name of the Symmetrix storage device monitored by OCI.
Usable Capacity by Array GB	Usable Capacity as reported by the storage array monitored by OCI.
Used Capacity %	% of Capacity Used as reported by the storage array. Thin provisioned capacity is % written. Thick provisioned capacity is 100% allocated.
Utilization Trends	The trend of Used Capacity % over the user selected time period.
Date	The date field applied to trending charts and selectable by the user.
Average FA Port Utilization	Average FA Port Utilization for EMC Symmetrix devices over the selected time period.
Disk Utilization	Average and Peak Disk Utilization % reported by the disks that support storage pools or RAID Groups over the selected time period.
Disk IOpS	Sum of Average Disk IOpS reported by the disks that support storage pools or RAID Groups over the selected time period.
Orphaned Capacity	This is capacity that is NOT flagged as mapped in OCI.
Volume IOpS	Sum of Average Volume IOpS reported by the Symmetrix Array for the selected time period.
Volume Latency	Average Latency in milliseconds reported by the Symmetrix Array for the selected time period.
Violations	Violations e.g. Inconsistent LUNS, Missing Active Hosts Ports, Missing Redundancy, Path Outage, etc. as captured by SAN Path Policies configured in OCI.

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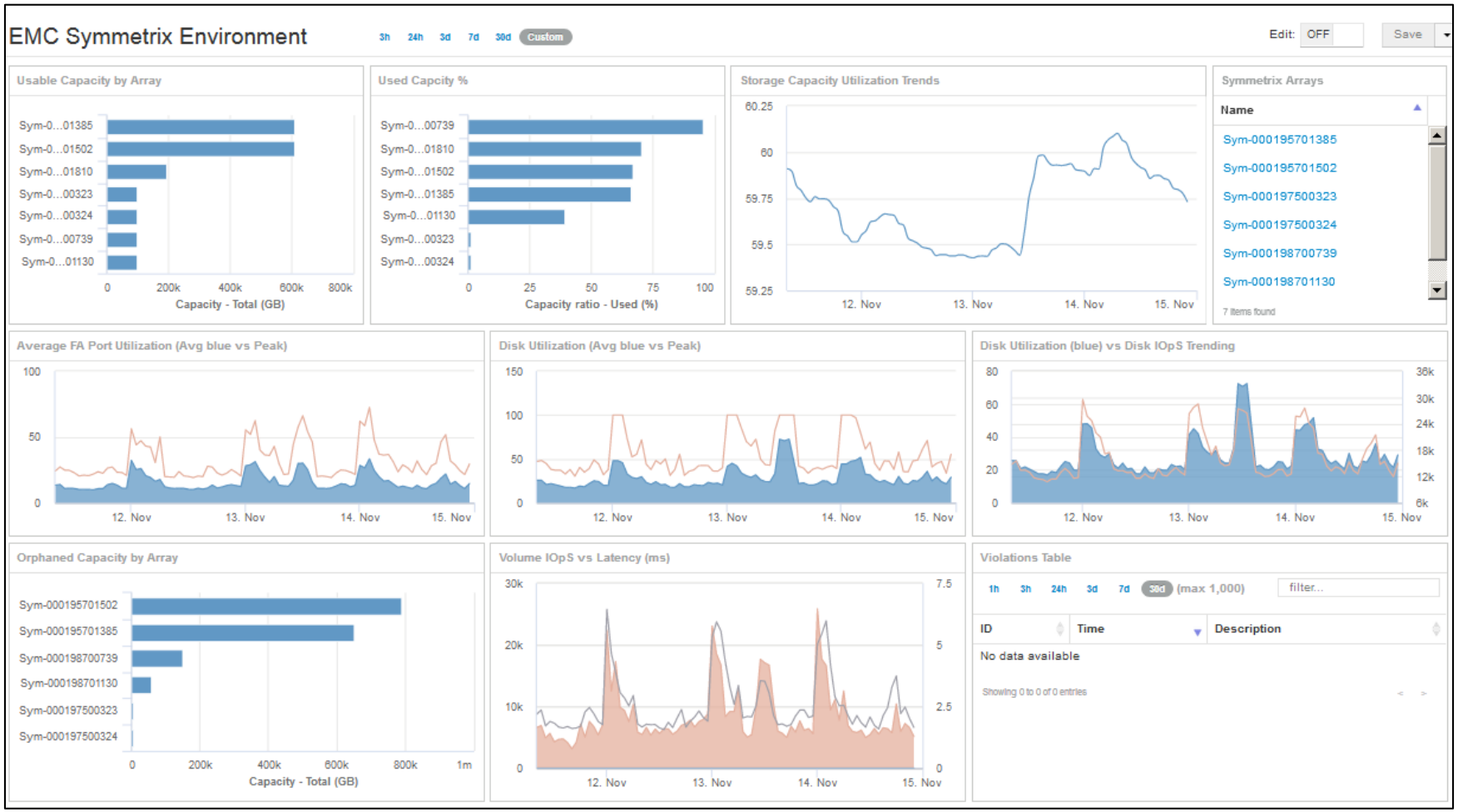
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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2.27 HDS Environment Usage

Description: This Hitachi (HDS) vendor centric dashboard created exclusively for Hitachi Arrays shows capacity and performance metrics for all devices by default. A filter is provided to select one or more arrays known to OCI. Thin and Thick Capacity metrics, Capacity Trends, IOpS, Latency, Throughput and Disk Utilization are visible using 14-day hourly performance metrics.

Prerequisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Version	The Model Name of the Hitachi Storage Array monitored by OCI.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Raw TB	Pre-RAID raw capacity in TB as reported by the Storage Array monitored by OCI and contained in the Storage and Storage Pool Capacity Fact table.
Thick Usable TB	Sum of LDEV configured capacity that is available for mapping and masking to host initiators.
Thin Usable TB	Usable capacity in TB as reported by the storage pool and contained in the Storage and Storage Pool Capacity Fact table.
Violations	Violation count for Path Outages, Single Point of Failure and Missing Redundancies as configured in OCI by SAN Path Policies.
Thick Allocated TB	LDEV capacity that is mapped and masked to host initiators.
Thick UnAllocated TB	LDEV capacity that is NOT mapped or masked to host initiators.
Thin Allocated TB	Capacity that is thin provisioned and allocated to host initiators.
Thin Used TB	Used capacity in TB that is flagged as thin provisioned as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. This is capacity that is written to the volume.
Subscription %	Thin Allocated TB / Thin Usable TB
% Used	Thin Used TB / Thin Usable TB
Latency (ms)	Average Volume Latency in milliseconds reported by the Hitachi Array for 14 days hourly.
Sum of Average/Peak MBps	Average and Peak Volume Throughput in MB/sec reported by the Hitachi Array for 14 days hourly.
Sum of Average/Peak IOpS	Average and Peak Volume IOpS reported by the Hitachi Array for 14 days hourly.
Disk Utilization%	Average and Peak Disk Utilization % reported by the disks that support storage pools or RAID Groups over the selected time period.

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Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption

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2.28 3PAR Environment Usage

Description: This dashboard depicts the overall 3PAR footprint within the global infrastructure. Starting off with basic capacity metrics, it displays how well the overall environment is performing against default thresholds that can be configured from a utilization and from a capacity perspective. This quickly describes what should be investigated and where additional storage may be required.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.

Click on the report screen shot above to view an enlarged image.

Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Version	The Model Name of the Hitachi Storage Array monitored by OCI.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Raw TB	Pre-RAID raw capacity in TB as reported by the Storage Array monitored by OCI and contained in the Storage and Storage Pool Capacity Fact table.
Thick Usable TB	Sum of Disk Capacity associated with CPG pools.
Thick Used Capacity GB	Sum of Disk Capacity – Available Capacity.
Available Capacity GB	Physical Disk Capacity associated with the FREE CHUNKLET storage pool.
Thin Usable TB	Usable capacity in TB as reported by the storage pool and contained in the Storage and Storage Pool Capacity Fact table.
Thin Used Capacity TB	Used capacity in TB as reported by the storage pool and contained in the Storage and Storage Pool Capacity Fact table. Thin Provisioned capacity is reported as written.
Thin Capacity Utilization %	Thin Used Capacity TB / Thin Usable TB
Thin Volume Allocated TB	Capacity that is thin provisioned to host initiators.
Subscription %	Thin Volume Allocated TB / Thin Usable TB
Violations	Violation count for Path Outages, Single Point of Failure and Missing Redundancies as configured in OCI by SAN Path Policies.
% Used	Thin Used TB / Thin Usable TB
Latency (ms)	Average Volume Latency in milliseconds reported by the Hitachi Array for 14 days hourly.
Sum of Average/Peak MBps	Average and Peak Volume Throughput in MB/sec reported by the Hitachi Array for 14 days hourly.
Sum of Average/Peak IOpS	Average and Peak Volume IOpS reported by the Hitachi Array for 14 days hourly.
Disk Utilization%	Average and Peak Disk Utilization % reported by the disks that support storage pools or RAID Groups over the selected time period.

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Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption

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2.29 NetApp Environment Usage

Description: This dashboard focuses on NetApp Capacity Utilization by Data Center and Tier. Usable and Capacity Trending are visible at the top of the page. Raw capacity, Usable capacity and Used capacity (as reported by the storage pool) are visible by Filer Version. Array count, aggregate count and volume count are available by Filer Version.

Prerequisites: Annotations/definitions are necessary for Data Center and Service Level/Tier. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Version	The version of the NetApp Storage Device E.g. Clustered Data ONTAP (CDOT) or 7-Mode
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Raw Capacity TB	Pre-RAID raw capacity in TB as reported by the Storage Array monitored by OCI and contained in the Storage and Storage Pool Capacity Fact table.
Usable Capacity TB	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Used Capacity TB	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Free Capacity TB	Usable Capacity TB – Used Capacity TB
Projected Used Capacity TB	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Disk Utilization	Average Disk Utilization % reported by the disks that support aggregates and averaged hourly for 14 days.
Node Utilization	Average CPU Utilization % reported by node monitored by OCI and averaged hourly for 14 days.
Volume Average IOpS	Average Internal Volume (Flexvol) IOpS reported by the storage controller monitored by OCI and averaged hourly for 14 days.
Capacity Utilization Trending	Used TB + Projected Used TB trended monthly.
Storage Pool Utilization Trending	Same as Disk Utilization.

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Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption

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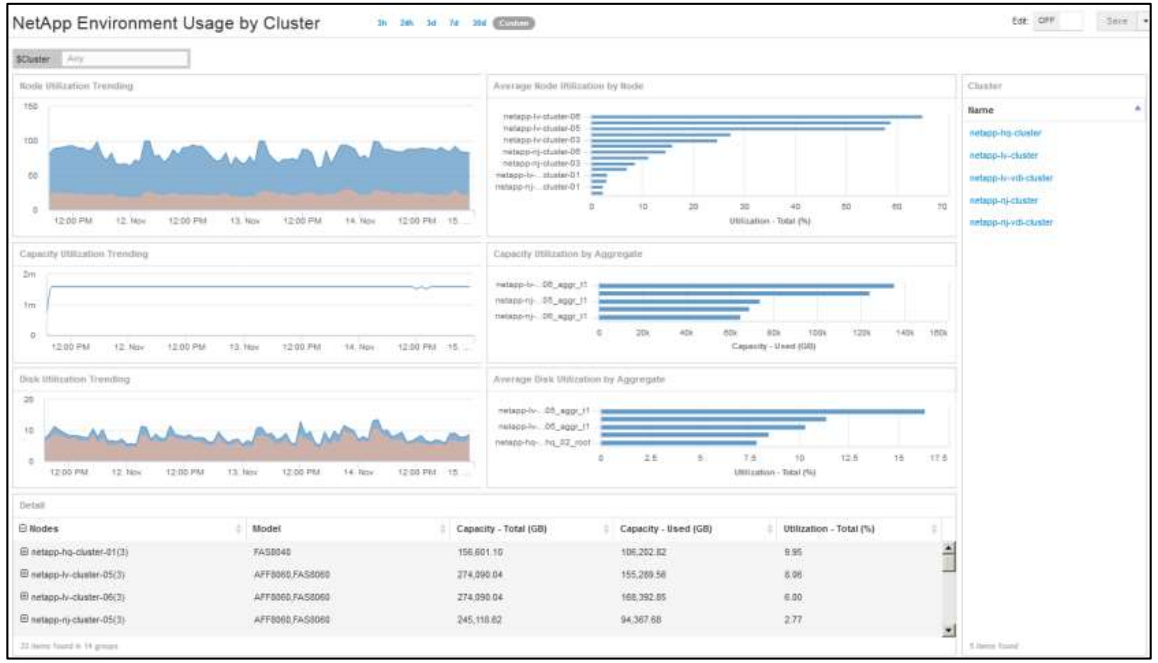
2.29 WebUI – NetApp Environment Usage by Cluster

Description: This WebUI based dashboard shows NetApp Capacity and Performance Utilization metrics.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Cluster	Name of the NetApp Cluster monitored by OCI.
Node	Name of the NetApp Node associated with the NetApp Cluster monitored by OCI.
Model	Model name of the NetApp Node.
Aggregate	Name of the Aggregate associated with the NetApp Node monitored by OCI.
Date	The date field applied to trending charts and selectable by the user.
Node Utilization	Average CPU Utilization % reported by node monitored by OCI over the selected time period.
Capacity Utilization	Capacity Utilization % reported by the node monitored by OCI over the selected time period.
Capacity – Total (GB)	Usable Capacity in GB as reported by the Aggregate associated with the NetApp Node monitored by OCI.
Capacity – Used (GB)	Used Capacity in GB as reported by the Aggregate associated with the NetApp Node monitored by OCI. Used capacity will equal data written if Space Guarantee is disabled. If Space Guarantee is enabled, then used will equal allocated.
Utilization – Total (%)	Used Capacity in %.

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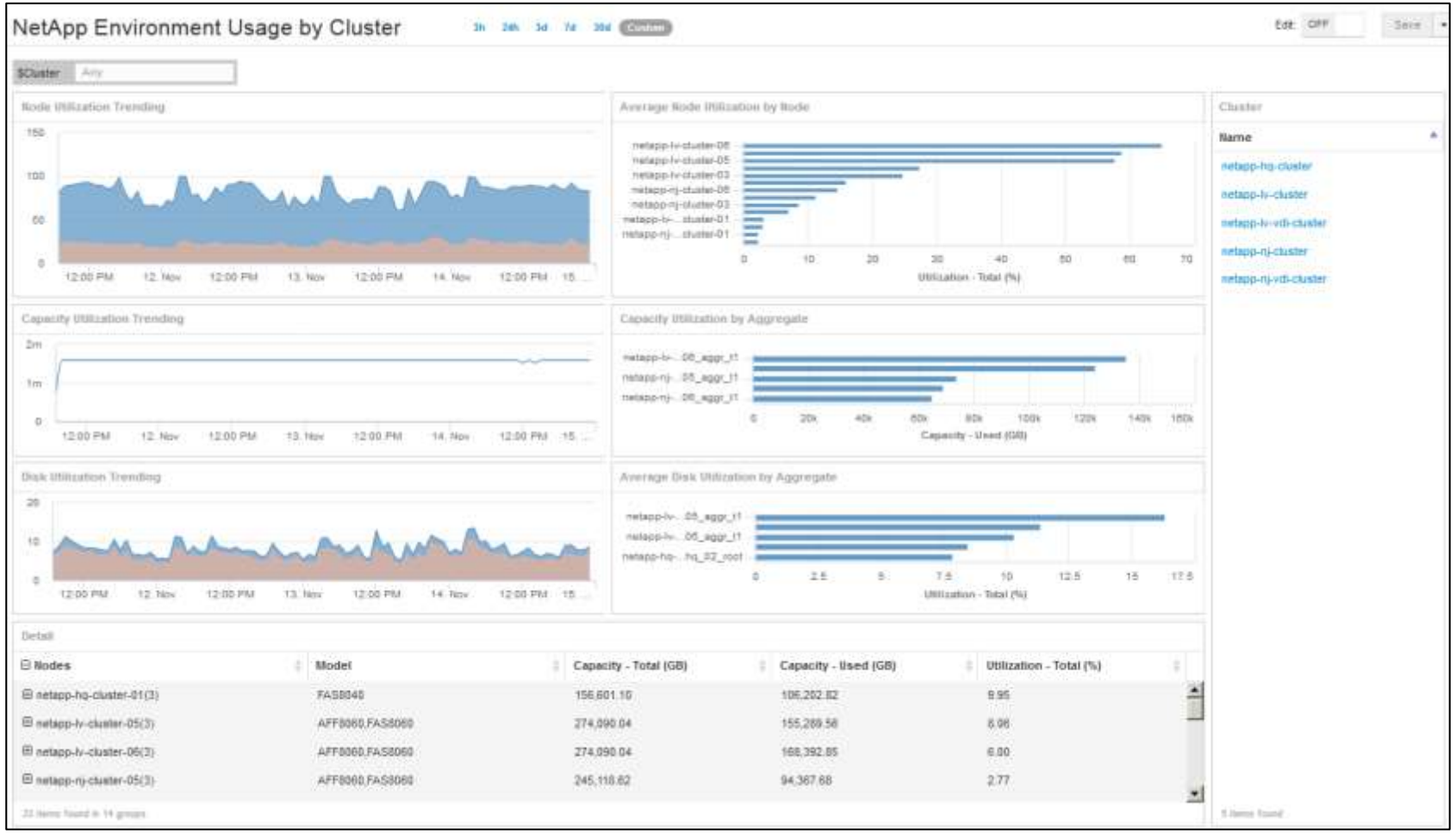
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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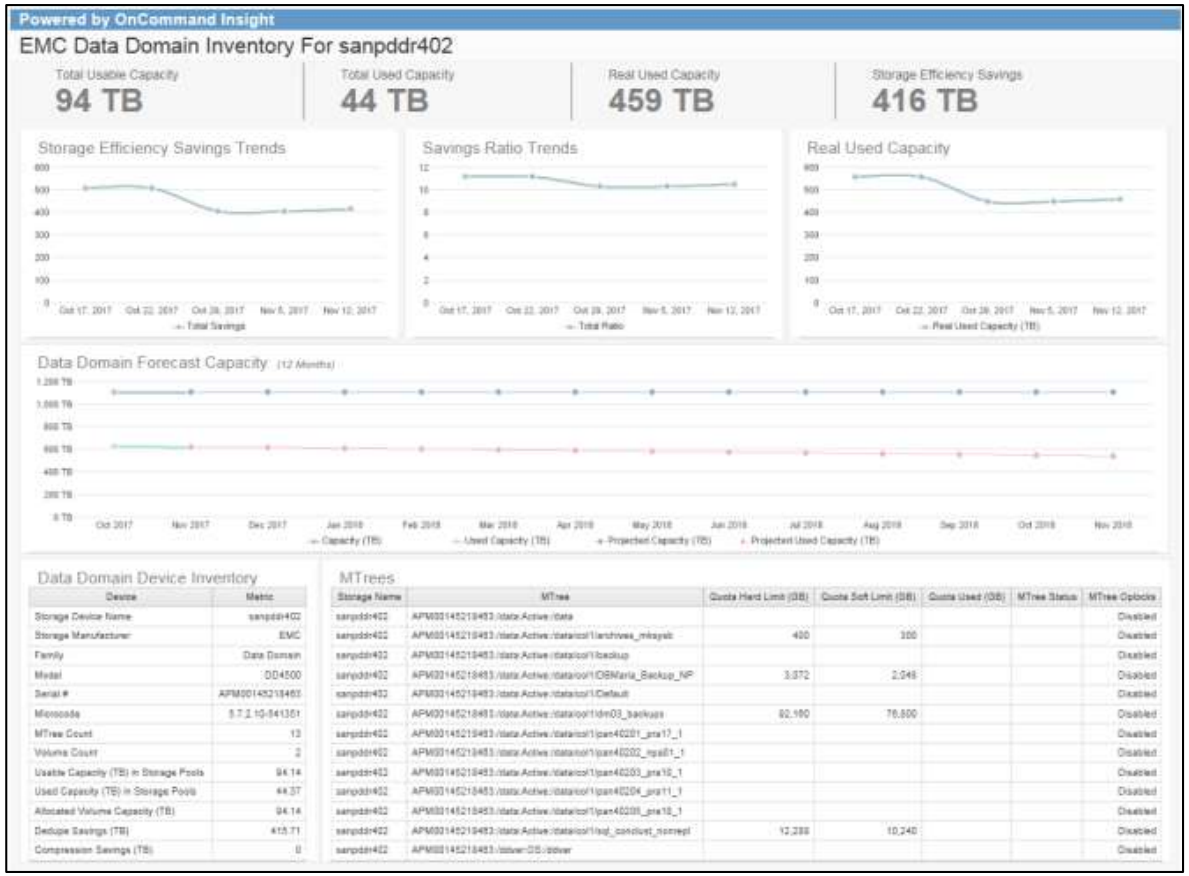
2.30 Data Domain Inventory (Page 1 of 2)

Description: This dashboard focuses on Data Domain Capacity and Inventory for each individual Data Domain device monitored by OCI. Capacity metrics summary is displayed at top. Storage Efficiency, Ratios and Real Used Capacity Trends are highlighted over a 30-day period. Forecast capacity for the next 12 months is based on linear regression formula. Device inventory with Mtrees are displayed at bottom.

Prerequisites: This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

See next page

 Click on the report screen shot above to view an enlarged image.

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2.30 Data Domain Inventory (Page 2 of 2)

Data Dictionary

☐ **Select This Report**

Field	Description
Storage Device Name	Name of the Data Domain storage device monitored by OCI.
Storage Manufacturer	Vendor name of the Data Domain storage device monitored by OCI.
Family	Family name of the Data Domain storage device monitored by OCI.
Model	Model name of the Data Domain storage device monitored by OCI.
Serial #	Serial Number of the Data Domain storage device monitored by OCI.
Microcode	Firmware or Microcode Version of the Data Domain storage device monitored by OCI.
MTree	Name of the MTree configured on the Data Domain device.
Quota Hard Limit (GB)	Quota Hard Capacity Limit in (GB) as configured on the Data Domain device.
Quota Soft Limit (GB)	Quota Soft Capacity Limit in (GB) as configured on the Data Domain device.
Quota Used (GB)	Quota Used in (GB).
MTree Status	The Status of the MTree.
MTree Oplocks	Whether or not Oplocks are enabled for this MTree.
MTree Count	Total Count of Mtrees configured for this Data Domain device.
Volume Count	Total Count of Volumes configured for this Data Domain device.
Usable Capacity (TB)	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Used Capacity (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Capacity (TB)	Same as Usable Capacity (TB).
Projected Capacity (TB)	Projected Usable Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Projected Used (TB)	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
Allocated Volume Capacity (TB)	Allocated Volume Capacity in (TB) provisioned to host initiators.

Field	Description
Dedupe Savings (TB)	The total amount of capacity savings by using Deduplication Storage Technology. The SQL Formula is: SUM(ROUND(dwh_capacity.internal_volume_capacity_fact.datausedCapacityMB * ((1-dwh_capacity.internal_volume_capacity_fact.dedupeRatio)/dwh_capacity.internal_volume_capacity_fact.dedupeRatio),2)))/1024/1024 as DedupeSavingsTB
Compression Savings (TB)	The total amount of capacity savings by using Compression Storage Technology. The SQL Formula is: SUM(ROUND(dwh_capacity.internal_volume_capacity_fact.datausedCapacityMB * ((1-dwh_capacity.internal_volume_capacity_fact.compressionRatio)/dwh_capacity.internal_volume_capacity_fact.compressionRatio),2)))/1024/1024 as DedupeSavingsTB
Total Savings	Dedupe Savings (TB) + Compression Savings (TB).
Total Ratio	The storage efficiency ratio. The SQL Formula is: ((SUM(dwh_capacity.internal_volume_capacity_fact.datausedCapacityMB) + (SUM(ROUND(dwh_capacity.internal_volume_capacity_fact.datausedCapacityMB * ((1-dwh_capacity.internal_volume_capacity_fact.dedupeRatio)/dwh_capacity.internal_volume_capacity_fact.dedupeRatio),2))) + (SUM(ROUND(dwh_capacity.internal_volume_capacity_fact.datausedCapacityMB * ((1-dwh_capacity.internal_volume_capacity_fact.compressionRatio)/dwh_capacity.internal_volume_capacity_fact.compressionRatio),2)))) / SUM(dwh_capacity.internal_volume_capacity_fact.datausedCapacityMB)) as 'Total Ratio'
Real Used Capacity (TB)	Dedupe Savings (TB) + Compression Savings (TB) + Used Capacity (TB).
Date	Fulldate field available in the DWH Date Dimension table.

See previous page

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Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption

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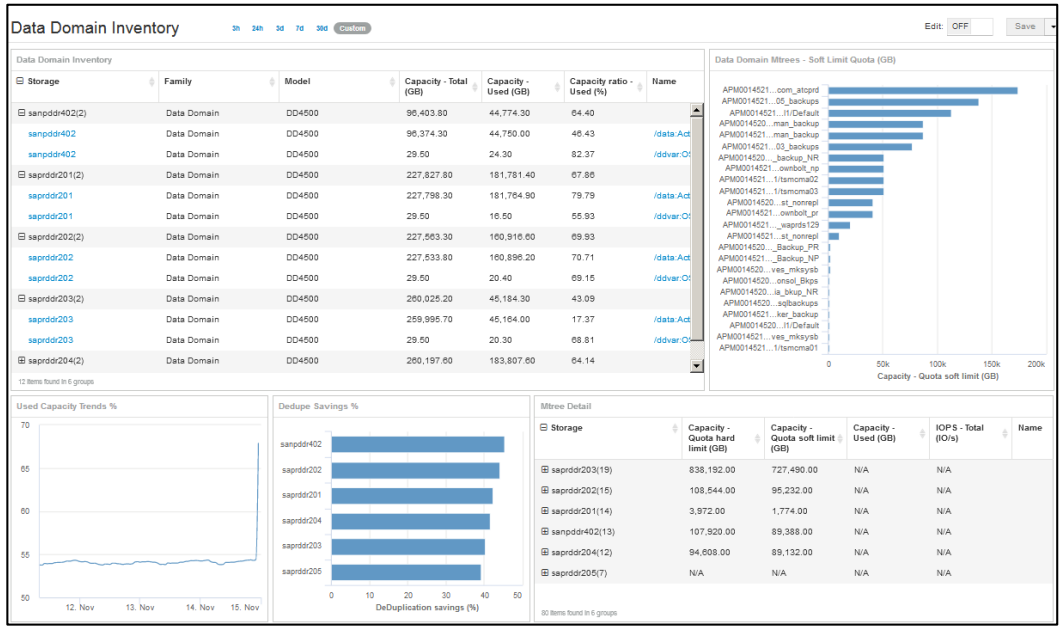
2.30 WebUI – Data Domain Inventory

Description: This WebUI based dashboard shows Data Domain Capacity and Performance Utilization metrics. Primarily, the dashboard breaks down capacity trends and storage efficiency technologies, showing top N devices for dedupe savings, MTree Soft Limits, and Mtree Detail.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage	Name of the Data Domain storage device monitored by OCI.
Family	Family name of the Data Domain storage device monitored by OCI.
Model	Model name of the Data Domain storage device monitored by OCI.
MTree	Name of the MTree configured on the Data Domain device.
Capacity – Total (GB)	Usable Capacity in (GB) as reported by the storage system monitored by OCI.
Capacity – Used (GB)	Used Capacity in (GB) as reported by the storage system monitored by OCI. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Capacity ratio – Used (%)	% of Capacity Used.
Name (Data Domain Inventory Table)	Name of the volume associated with the Data Domain device monitored by OCI.
Dedupe Savings %	The total amount of capacity in % logged as savings by using Deduplication Storage Technology.
Capacity Quota Hard Limit (GB)	Quota Hard Capacity Limit in (GB) as configured on the Data Domain device.
Capacity Quota Soft Limit (GB)	Quota Soft Capacity Limit in (GB) as configured on the Data Domain device.
Capacity Used (GB)	Quota Used in (GB).
IOpS Total (IO/s)	Sum of Volume Average IOpS reported by the Data Domain device over the user selected collection period.
Name (MTree Detail Table)	Name of the MTree associated with the Data Domain device monitored by OCI.

 Click on the report screen shot above to view an enlarged image.

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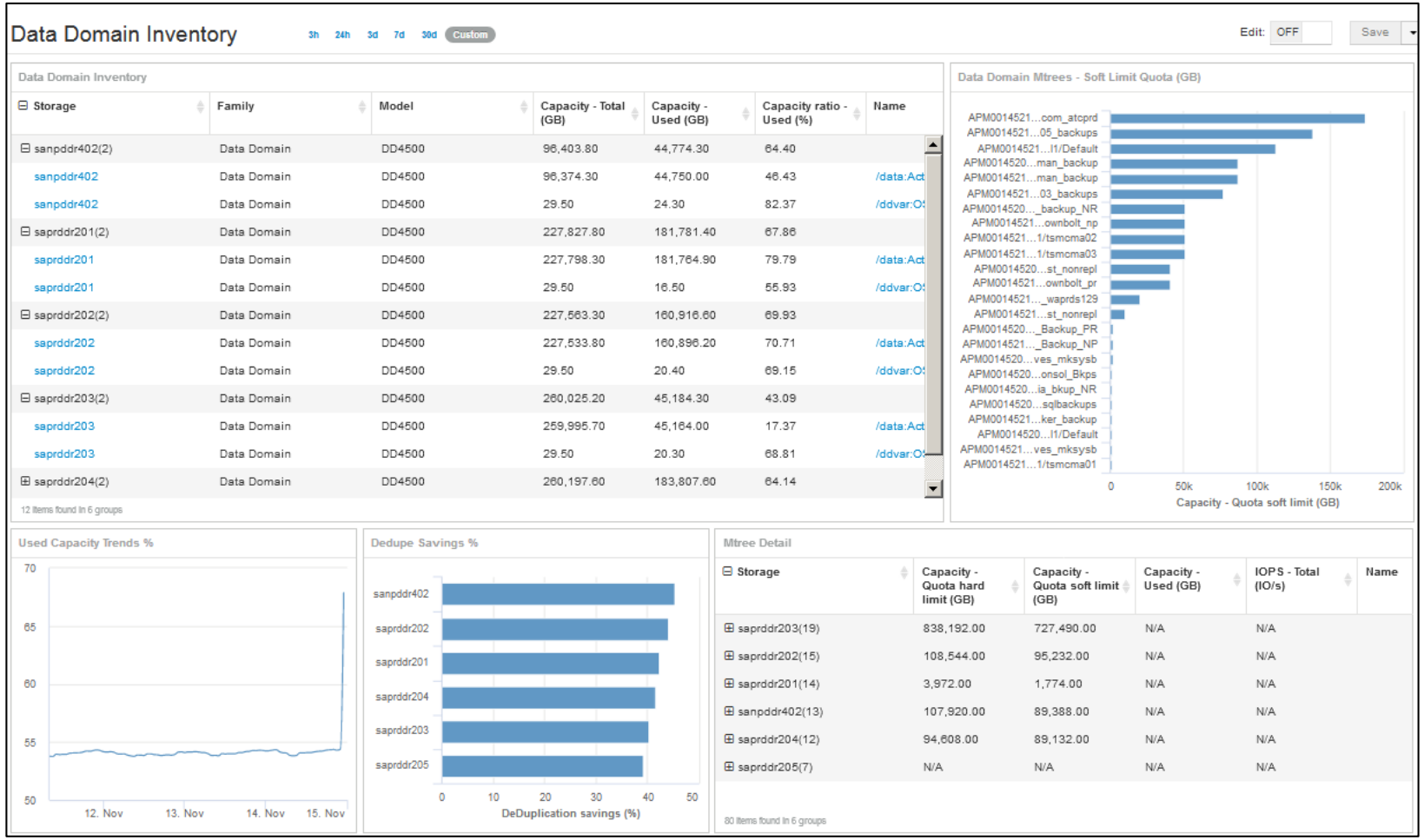

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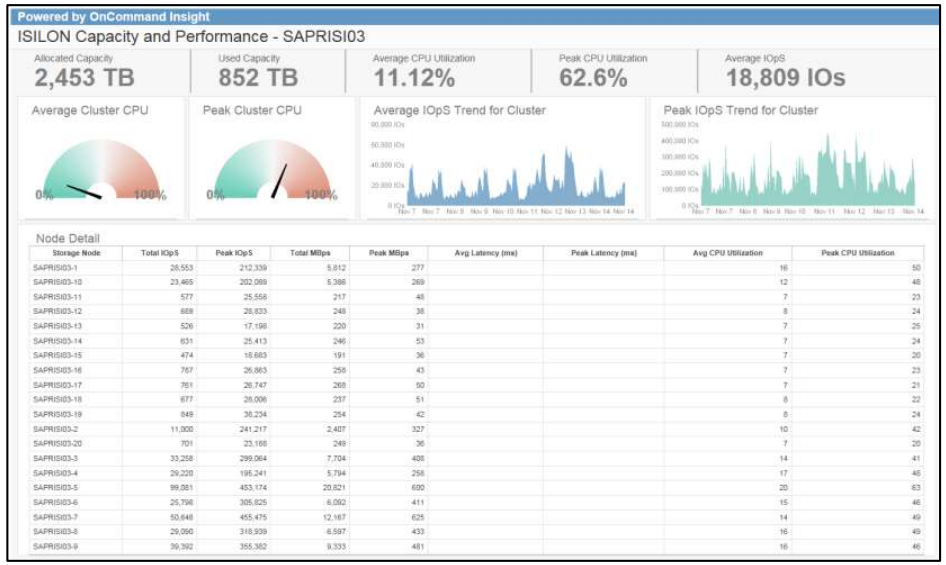
2.31 Isilon Capacity and Performance

Description: This dashboard focuses on Isilon Capacity and Performance for each individual Isilon device monitored by OCI. Capacity and Performance metrics summary are displayed at top. Gauges for Average Cluster CPU Utilization and Peak CPU Utilization are visible near top left. Trends for IOpS and Peak IOpS are available near top right and Node Detail appears at bottom. There is NO latency for Isilon devices in OCI at this time.

Prerequisites: This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Node	Name of the Isilon Node associated with the Isilon Cluster monitored by OCI.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Allocated Capacity TB	Internal Volume Allocated Capacity in TB as reported by the storage device
Used Capacity TB	Internal Volume Used Capacity in TB
Average Cluster CPU	Average CPU Utilization % reported by each Node associated with the Cluster for 14 days hourly.
Peak Cluster CPU	Peak CPU Utilization % reported by each Node associated with the Cluster for 14 days hourly.
Average Cluster IOpS	Average IOpS reported for each Node associated with the Cluster for 14 days hourly.
Peak Cluster IOpS	Peak IOpS reported for each Node associated with the Cluster for 14 days hourly.
Total IOpS	Both Read and Write IOpS reported by the Node for 14 days hourly.
Peak IOpS	Peak IOpS reported by the Node for 14 days hourly.
Total MBps	Both Read and Write Throughput in MB/sec reported by the Node for 14 days hourly .
Peak MBps	Peak Throughput in MB/sec reported by the Node for 14 days hourly.
Avg Latency (ms)	Placeholder for latency metric.
Peak Latency (ms)	Placeholder for latency metric.
Avg CPU Utilization (Node)	Average CPU Utilization % reported by the Node for 14 days hourly.
Peak CPU Utilization (Node)	Peak CPU Utilization % reported by the Node for 14 days hourly.

 Click on the report screen shot above to view an enlarged image.

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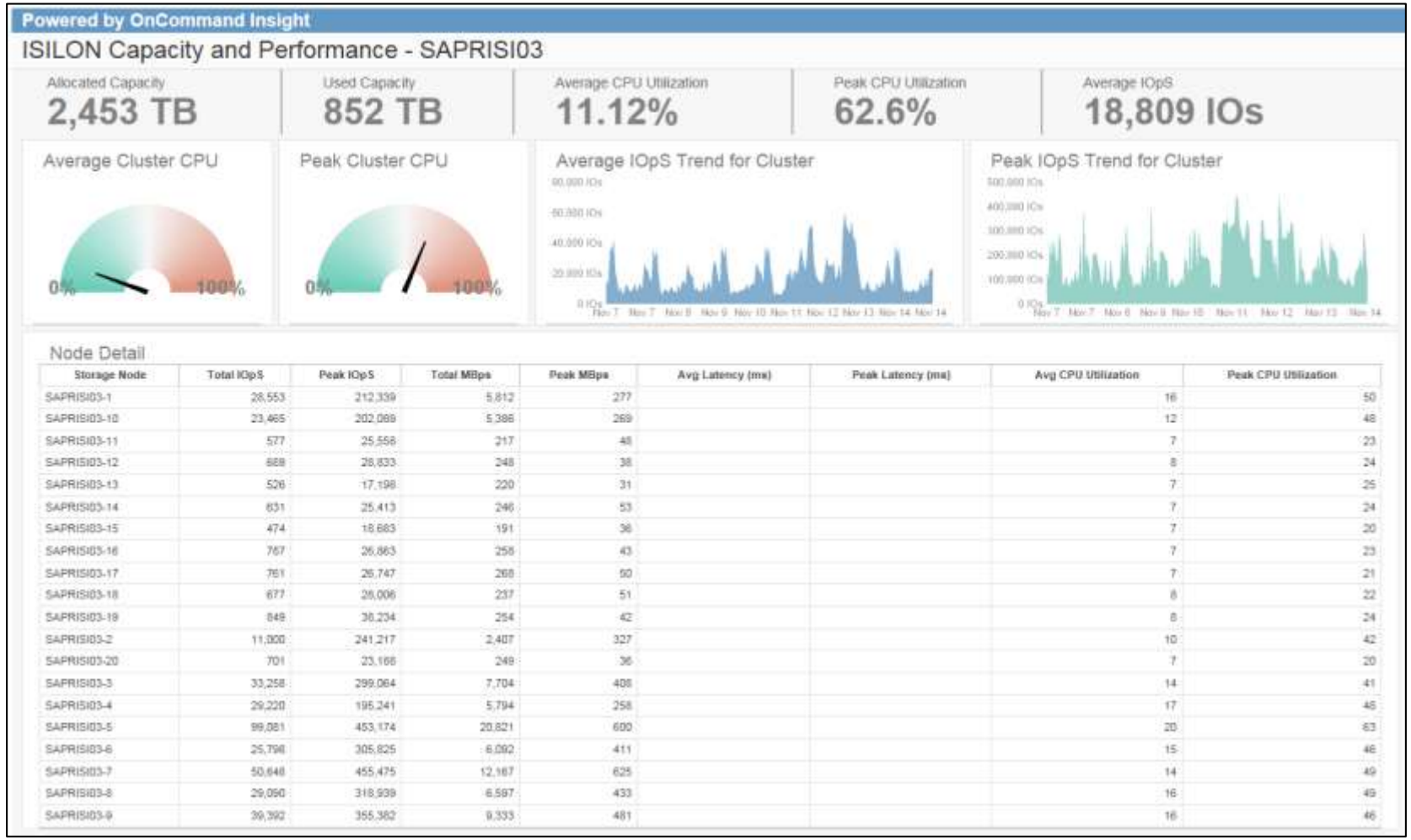

Storage Node	Total IOpS	Peak IOpS	Total MBps	Peak MBps	Avg Latency (ms)	Peak Latency (ms)	Avg CPU Utilization	Peak CPU Utilization
SAPRISI03-1	28,553	212,339	5,812	277			16	50
SAPRISI03-10	23,465	202,089	5,386	269			12	48
SAPRISI03-11	577	25,558	217	48			7	23
SAPRISI03-12	688	28,833	248	38			8	24
SAPRISI03-13	526	17,198	220	31			7	25
SAPRISI03-14	631	25,413	246	53			7	24
SAPRISI03-15	474	18,683	191	36			7	20
SAPRISI03-16	767	26,863	258	43			7	23
SAPRISI03-17	761	26,747	268	50			7	21
SAPRISI03-18	677	28,006	237	51			8	22
SAPRISI03-19	849	38,234	254	42			8	24
SAPRISI03-2	11,000	241,217	2,407	327			10	42
SAPRISI03-20	701	23,168	249	36			7	20
SAPRISI03-3	33,258	299,064	7,704	408			14	41
SAPRISI03-4	29,220	195,241	5,794	258			17	46
SAPRISI03-5	99,081	453,174	20,821	600			20	63
SAPRISI03-6	25,798	305,825	6,092	411			15	46
SAPRISI03-7	50,648	455,475	12,167	625			14	49
SAPRISI03-8	29,050	318,939	6,587	433			16	49
SAPRISI03-9	39,392	355,382	9,333	481			16	46

 Click on the screen shot above to return to the report description.

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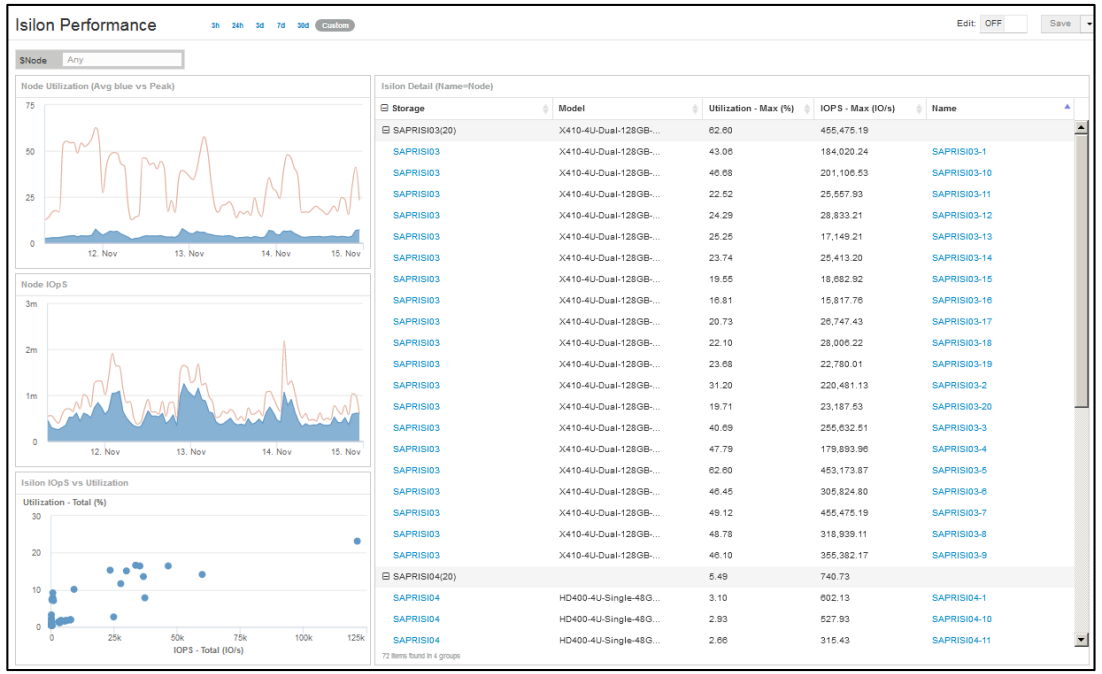
2.31 WebUI – Isilon Performance

Description: This WebUI based dashboard shows Isilon Performance Utilization metrics. Node Utilization and Node IOpS for both Average and Peak are trended over the user selected time period. IOpS vs Utilization is compared using a bubble chart and Isilon Detail is listed on the right.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage	Name of the Isilon Storage Cluster monitored by OCI.
Name	Name of the Isilon Node associated with the Isilon Cluster monitored by OCI.
Model	Model name of the Isilon Cluster.
Utilization – Max (%)	Peak Node CPU Utilization % for the user selected time period.
IOpS Max (IO/s)	Peak IOpS for the user selected time period.
Avg Node Utilization %	Average Node CPU Utilization % for the user selected time period.
Peak Node Utilization %	Same as Utilization Max.
Sum of Avg Node IOpS	Sum of Average IOpS as reported by the Isilon Controller for the user selected time period.
Sum of Peak Node IOpS	Sum of Peak IOpS as reported by the Isilon Controller for the user selected time period.

 Click on the report screen shot above to view an enlarged image.

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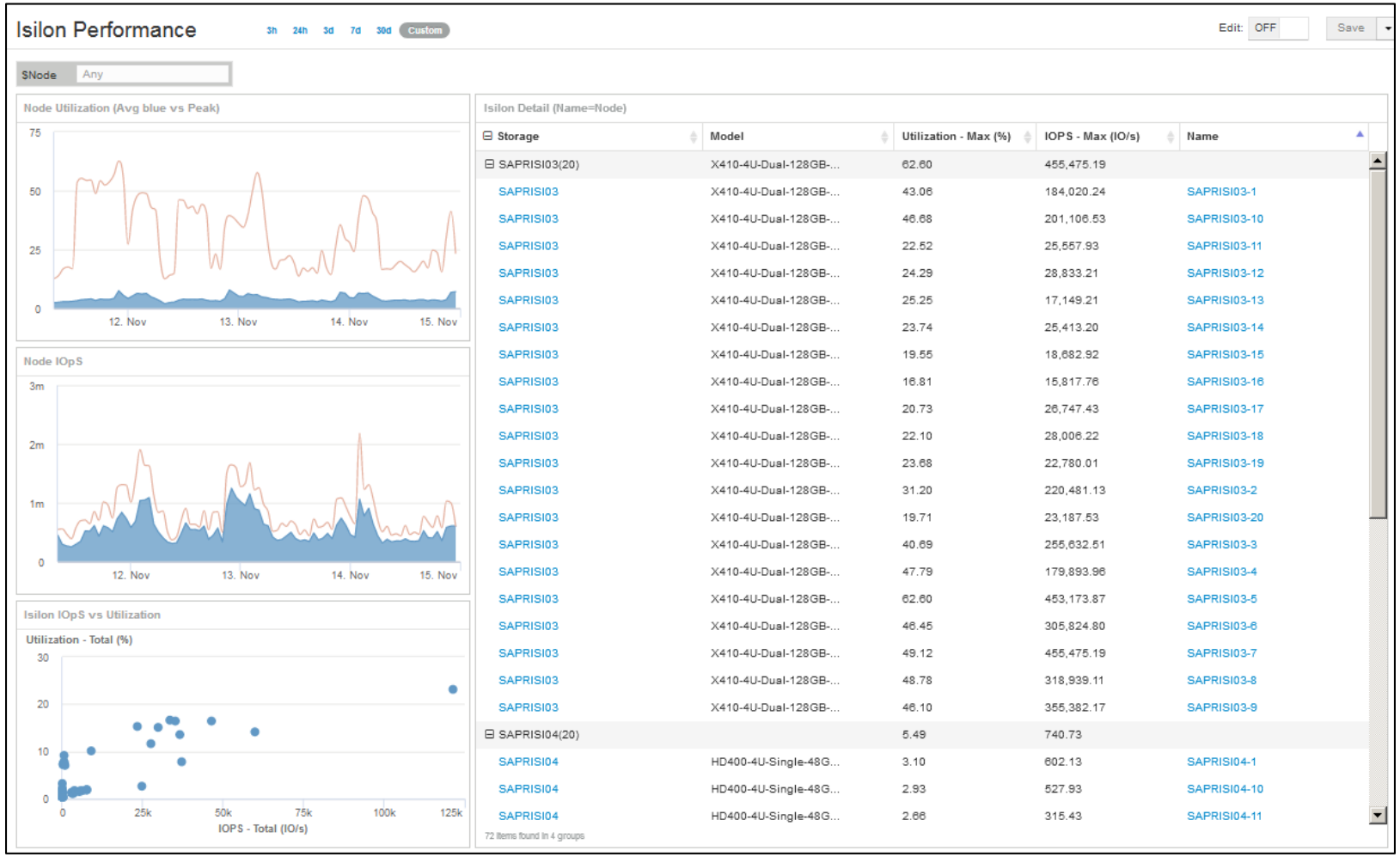

Storage	Model	Utilization - Max (%)	IOPS - Max (IO/s)	Name
SAPRISI03(20)	X410-4U-Dual-128GB-...	62.60	455,475.19	
SAPRISI03	X410-4U-Dual-128GB-...	43.06	184,020.24	SAPRISI03-1
SAPRISI03	X410-4U-Dual-128GB-...	46.68	201,106.53	SAPRISI03-10
SAPRISI03	X410-4U-Dual-128GB-...	22.52	25,557.93	SAPRISI03-11
SAPRISI03	X410-4U-Dual-128GB-...	24.29	28,833.21	SAPRISI03-12
SAPRISI03	X410-4U-Dual-128GB-...	25.25	17,149.21	SAPRISI03-13
SAPRISI03	X410-4U-Dual-128GB-...	23.74	25,413.20	SAPRISI03-14
SAPRISI03	X410-4U-Dual-128GB-...	19.55	18,682.92	SAPRISI03-15
SAPRISI03	X410-4U-Dual-128GB-...	16.81	15,817.76	SAPRISI03-16
SAPRISI03	X410-4U-Dual-128GB-...	20.73	26,747.43	SAPRISI03-17
SAPRISI03	X410-4U-Dual-128GB-...	22.10	28,006.22	SAPRISI03-18
SAPRISI03	X410-4U-Dual-128GB-...	23.68	22,780.01	SAPRISI03-19
SAPRISI03	X410-4U-Dual-128GB-...	31.20	220,481.13	SAPRISI03-2
SAPRISI03	X410-4U-Dual-128GB-...	19.71	23,187.53	SAPRISI03-20
SAPRISI03	X410-4U-Dual-128GB-...	40.69	255,632.51	SAPRISI03-3
SAPRISI03	X410-4U-Dual-128GB-...	47.79	179,893.96	SAPRISI03-4
SAPRISI03	X410-4U-Dual-128GB-...	62.60	453,173.87	SAPRISI03-5
SAPRISI03	X410-4U-Dual-128GB-...	46.45	305,824.80	SAPRISI03-6
SAPRISI03	X410-4U-Dual-128GB-...	49.12	455,475.19	SAPRISI03-7
SAPRISI03	X410-4U-Dual-128GB-...	48.78	318,939.11	SAPRISI03-8
SAPRISI03	X410-4U-Dual-128GB-...	46.10	355,382.17	SAPRISI03-9
SAPRISI04(20)		5.49	740.73	
SAPRISI04	HD400-4U-Single-48G...	3.10	602.13	SAPRISI04-1
SAPRISI04	HD400-4U-Single-48G...	2.93	527.93	SAPRISI04-10
SAPRISI04	HD400-4U-Single-48G...	2.66	315.43	SAPRISI04-11

 Click on the screen shot above to return to the report description.

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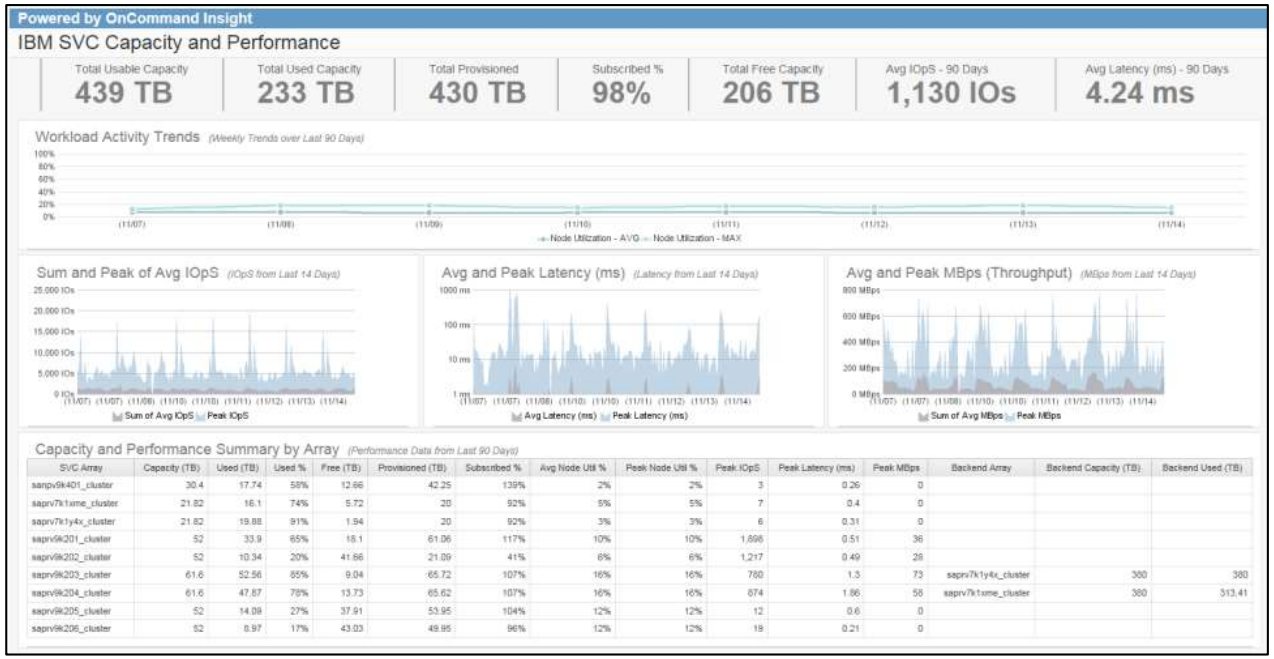
2.32 IBM SVC Capacity and Performance (Page 1 of 2)

Description: The focus of this dashboard is to present IBM SVC Capacity and Performance metrics. When the report is run, a global view of the SVC environment is shown. At the top of the page, a summary of capacity and performance is available. Workload Activity Trends as reported by the SVC shows how busy the environment is. Average and Peak performance metrics are trended hourly for 14 days and a detail summary is included at the bottom. The user has the capability of selecting individual SVC devices from the dropdown on the right side of the page.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

See next page



 Click on the report screen shot above to view an enlarged image.

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2.32 IBM SVC Capacity and Performance (Page 2 of 2)

Data Dictionary

☐ **Select This Report**

Field	Description
SVC Array	Name of the SVC Array monitored by OCI.
Total Usable Capacity TB	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Total Used Capacity TB	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Total Provisioned TB	Volume Allocated capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Subscribed %	Total Provisioned TB / Total Usable Capacity TB
Total Free Capacity TB	Total Usable Capacity TB – Total Used Capacity TB
Date	The date field applied to trending charts and selectable by the user.
Avg IOpS	Average Daily IOpS collected for a period of 90 days.
Avg Latency	Average Daily Latency in milliseconds collected for a period of 90 days.
Sum /Peak IOpS	Sum of Average and Peak IOpS collected hourly for a period of 14 days.
Avg/Peak Latency	Sum of Average and Peak Latency in milliseconds collected hourly for a period of 14 days.
Avg/Peak MBps (Throughput)	Sum of Average and Peak Throughput in MB/sec collected hourly for a period of 14 days.
Capacity (TB)	Same as Total Usable Capacity TB.

Field	Description
Used (TB)	Same as Total Used Capacity TB.
Used %	Used (TB) / Capacity (TB)
Free (TB)	Capacity (TB) – Free (TB)
Provisioned (TB)	Same as Total Provisioned TB.
Avg Node Util %	Average Daily CPU Utilization % collected for a period of 90 days.
Peak Node Util %	Peak Daily CPU Utilization % collected for a period of 90 days.
Peak IOpS	Average Daily Peak IOpS collected for a period of 90 days.
Peak Latency	Average Daily Peak Latency in milliseconds collected for a period of 90 days.
Peak MBps	Average Daily Peak Throughput in MB/sec collected for a period of 90 days.
Backend Array	Name of the Array monitored by OCI that supports the IBM SVC.
Backend Capacity (TB)	Usable capacity of the backend array that supports the IBM SVC.
Backend Used (TB)	Used capacity of the backend array that supports the IBM SVC.

See previous page

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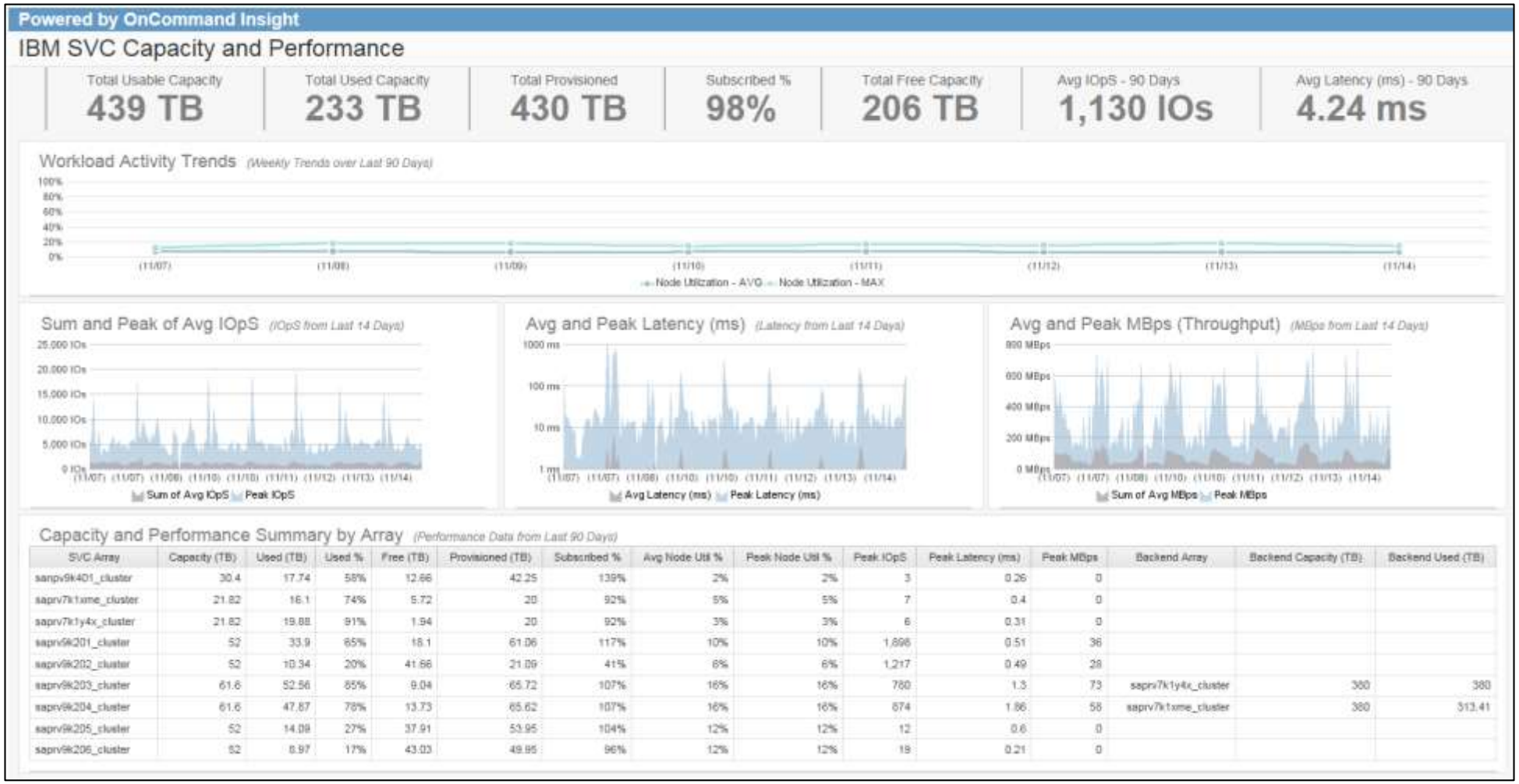

SVC Array	Capacity (TB)	Used (TB)	Used %	Free (TB)	Provisioned (TB)	Subscribed %	Avg Node Util %	Peak Node Util %	Peak IOpS	Peak Latency (ms)	Peak MBps	Backend Array	Backend Capacity (TB)	Backend Used (TB)
sanpv9k401_cluster	30.4	17.74	58%	12.66	42.25	139%	2%	2%	3	0.26	0			
saprv7k1xme_cluster	21.82	16.1	74%	5.72	20	92%	5%	5%	7	0.4	0			
saprv7k1y4x_cluster	21.82	19.88	91%	1.94	20	92%	3%	3%	6	0.31	0			
saprv9k201_cluster	52	33.9	65%	18.1	61.06	117%	10%	10%	1,898	0.51	36			
saprv9k202_cluster	52	10.34	20%	41.66	21.09	41%	6%	6%	1,217	0.49	28			
saprv9k203_cluster	61.6	52.56	85%	9.04	65.72	107%	16%	16%	780	1.3	73	saprv7k1y4x_cluster	380	380
saprv9k204_cluster	61.6	47.87	78%	13.73	65.62	107%	16%	16%	674	1.86	58	saprv7k1xme_cluster	380	313.41
saprv9k205_cluster	52	14.09	27%	37.91	53.95	104%	12%	12%	12	0.6	0			
saprv9k206_cluster	52	8.97	17%	43.03	49.95	96%	12%	12%	19	0.21	0			

 Click on the screen shot above to return to the report description.

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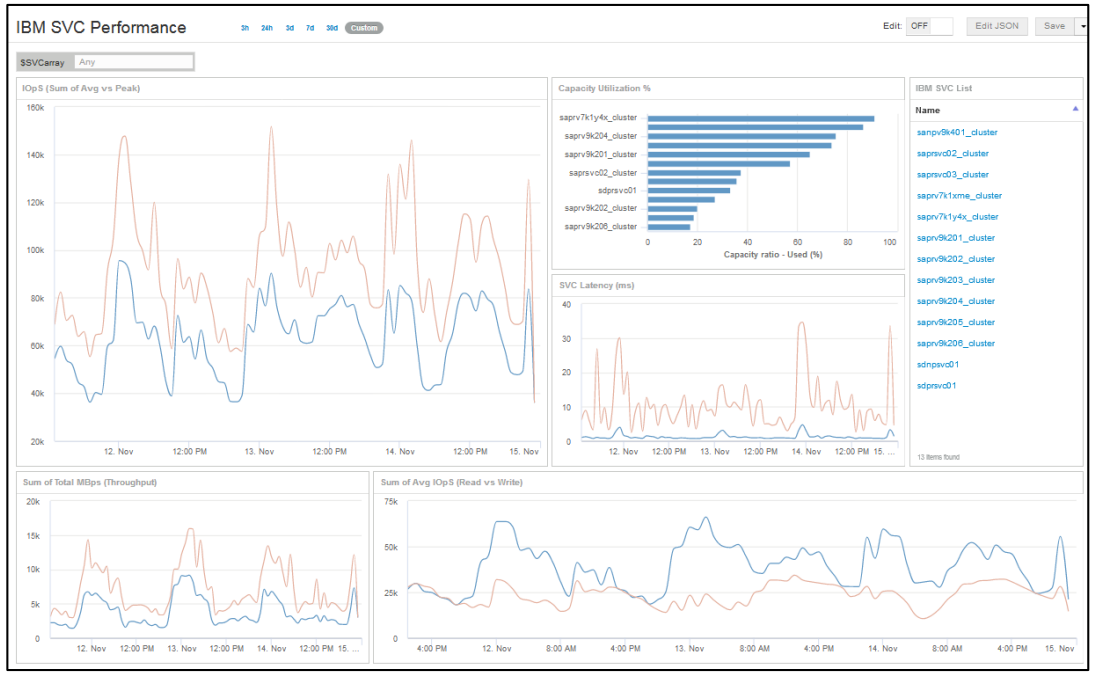
2.32 WebUI – IBM SVC Capacity and Performance

Description: This WebUI based dashboard shows IBM SVC Capacity and Performance Utilization metrics. Trends of IOpS, Latency and Throughput are analyzed. Top SVC capacity utilization is shown, and the list of IBM SVCs known to OCI are available for drill down.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
$SVCarray	Input variable used to filer the dashboard for a specific IBM SVC device monitored by OCI.
Name	Name of the IBM SVC monitored by OCI.
Sum of Average and Peak IOpS	Sum of Average and Peak IOpS collected for the user selected time period.
Avg Latency	Average Latency in milliseconds collected for the user selected time period.
Sum of Average and Peak MBps	Sum of Average and Peak Throughput in MB/sec collected for the user selected time period.
Sum of Avg IOpS Read and Write	Sum of Average Read and Write IOpS collected for the user selected time period.
Capacity Utilization %	Used capacity % as reported by the IBM SVC device monitored by OCI.
Date	The date field applied to trending charts and selectable by the user.

 Click on the report screen shot above to view an enlarged image.

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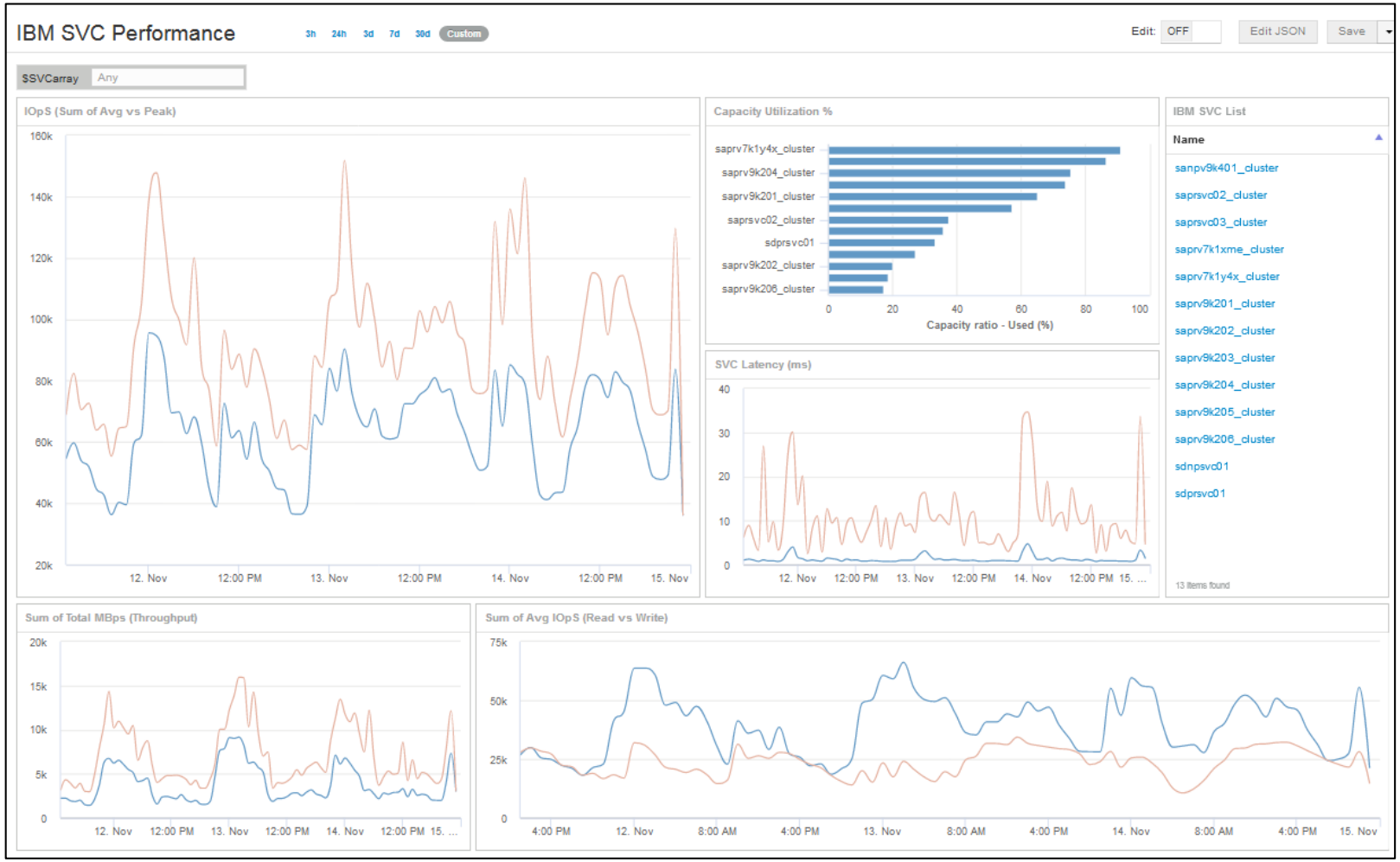
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



 Click on the screen shot above to return to the report description.

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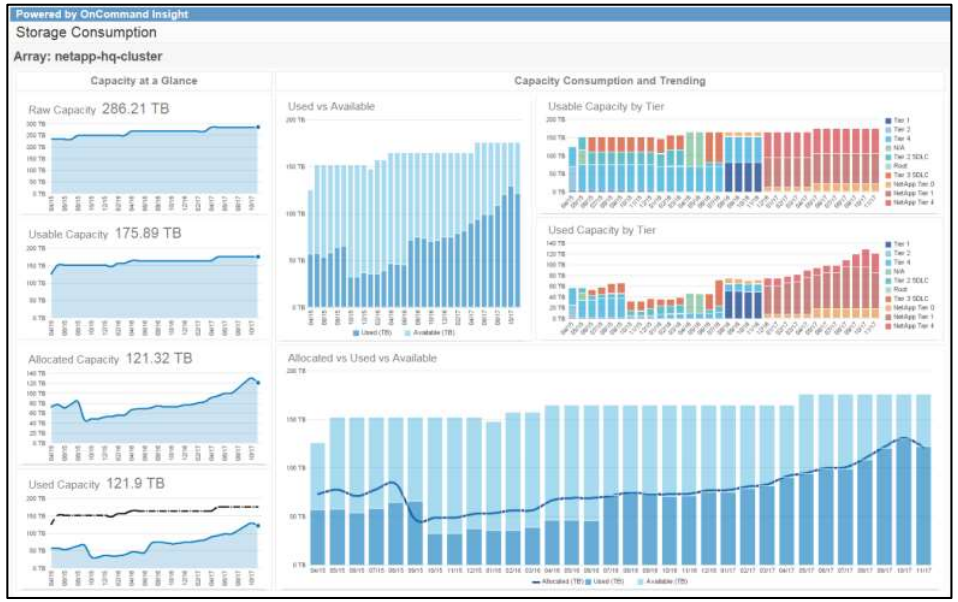
2.33 Storage Consumption – All Arrays

Description: The purpose of this report is to provide a full list of storage devices for capacity consumption. Each storage device dashboard is displayed on separate pages and is best viewed using PDF as an output type. Metrics include Raw Capacity, Usable, Allocated (provisioned to hosts) and Used capacity consumption. Metrics include Raw Capacity, Usable, Allocated (provisioned to hosts) and Used (as reported by the storage pool). Trends of the above metrics are visible as well.

Prerequisites: Annotations/definitions are necessary for Service Level/Tier. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Array	Name of the storage array monitored by OCI.
Tier	OCI configured annotation. Defines tiers of storage or Service Levels based on disk type, disk speed, or IOpS/TB.
Date	Fulldate field available in the DWH Date Dimension table.
Raw Capacity TB	Pre-RAID raw capacity in TB as reported by the Storage Array monitored by OCI and contained in the Storage and Storage Pool Capacity Fact table.
Usable Capacity TB	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Allocated Capacity TB	Volume Allocated capacity in TB as reported by the storage pool or aggregate associated with the storage device and contained in the Storage and Storage Pool Capacity Fact table.
Used Capacity TB	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Available (TB)	Usable Capacity TB – Used Capacity TB
Used (TB)	Same as Used Capacity TB
Allocated (TB)	Same as Allocated Capacity TB

 Click on the report screen shot above to view an enlarged image.

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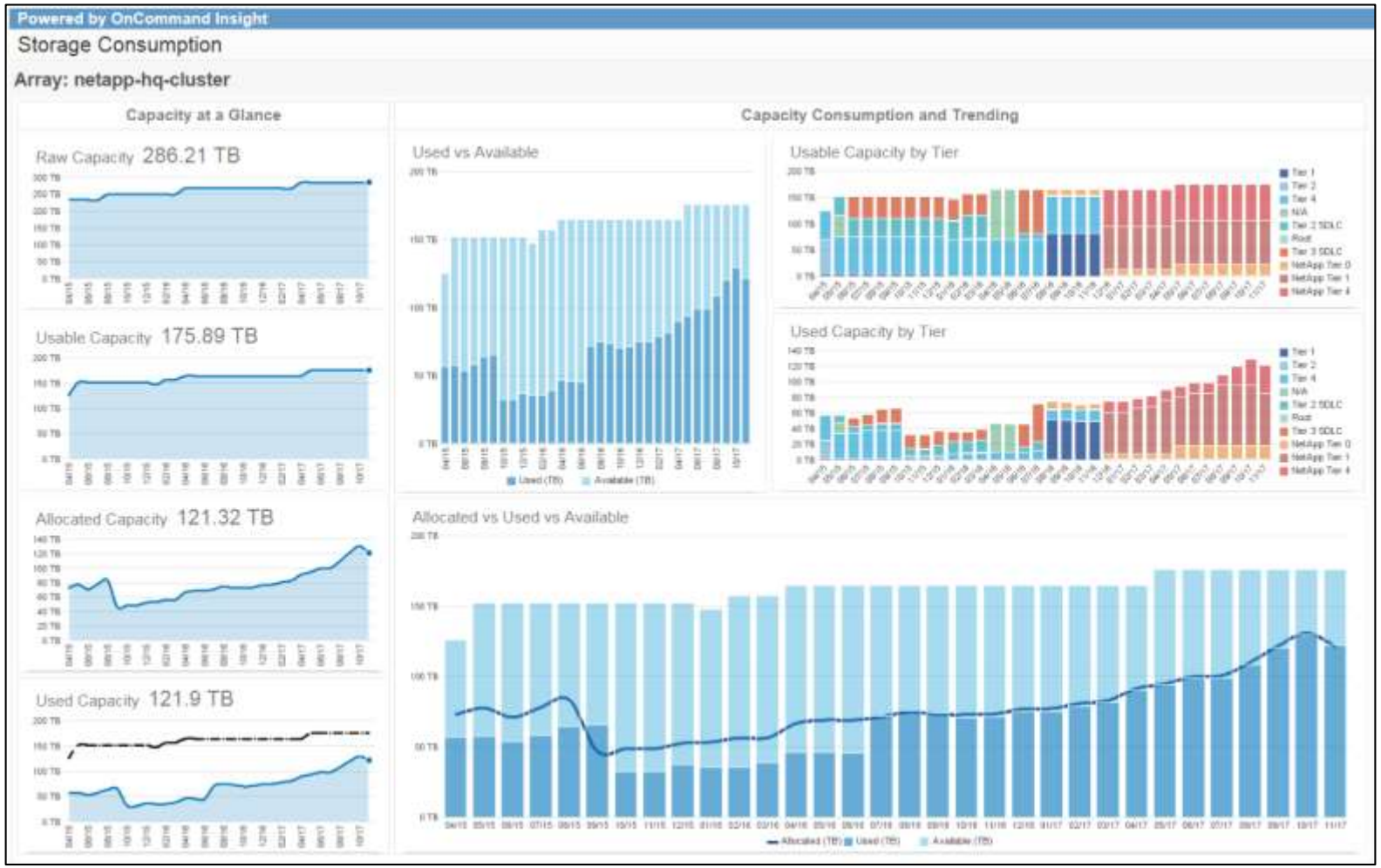
Overview	Storage Capacity Exec. Overview	Storage Infrastructure Executive Summary	On-Prem Storage Executive Summary	Capacity Forecast and Trends	NetApp Node Capacity Forecast and Trends	NA Node Capacity Forecast & Trends-All Clusters w Nodes	Storage Pool Forecast and Trends	NetApp Internal Volume Forecast	Storage Capacity Projections WHAT-IF	Storage Summary
Service Level Objectives – Capacity	WebUI – Service Level Objectives	Allocated vs Un-Allocated Capacity	Available Capacity Dashboard	Global Capacity Changes	Global Environment Changes	NetApp Capacity – Orphaned by Performance	Capacity Recovery or Cost Reduction	Reclamation, Efficiency, and Allocation Life Cycle	WebUI - Orphaned Storage Dashboard	WebUI- Orphaned Volumes – Storage at Rest
NAS Subscribed	NetApp SAN and NAS Capacity Summary	BU Summary of Capacity with Applications	WebUI – BU Summary of Capacity with Applications	Capacity Changes and Growth	Application Capacity Changes and Growth	Global Usable Capacity	WebUI – Global Capacity Utilization	EMC Symmetrix Environment	WebUI – EMC Symmetrix Environment	HDS Environment Usage
3PAR Environment Usage	NetApp Environment Usage	WebUI – NA Environment Usage by Cluster	Data Domain Inventory	WebUI – Data Domain Inventory	Isilon Capacity and Performance	WebUI – Isilon Performance	IBM SVC Capacity and Performance	WebUI – IBM SVC Capacity and Performance	Storage Consumption – All Arrays	Weekly Storage Consumption



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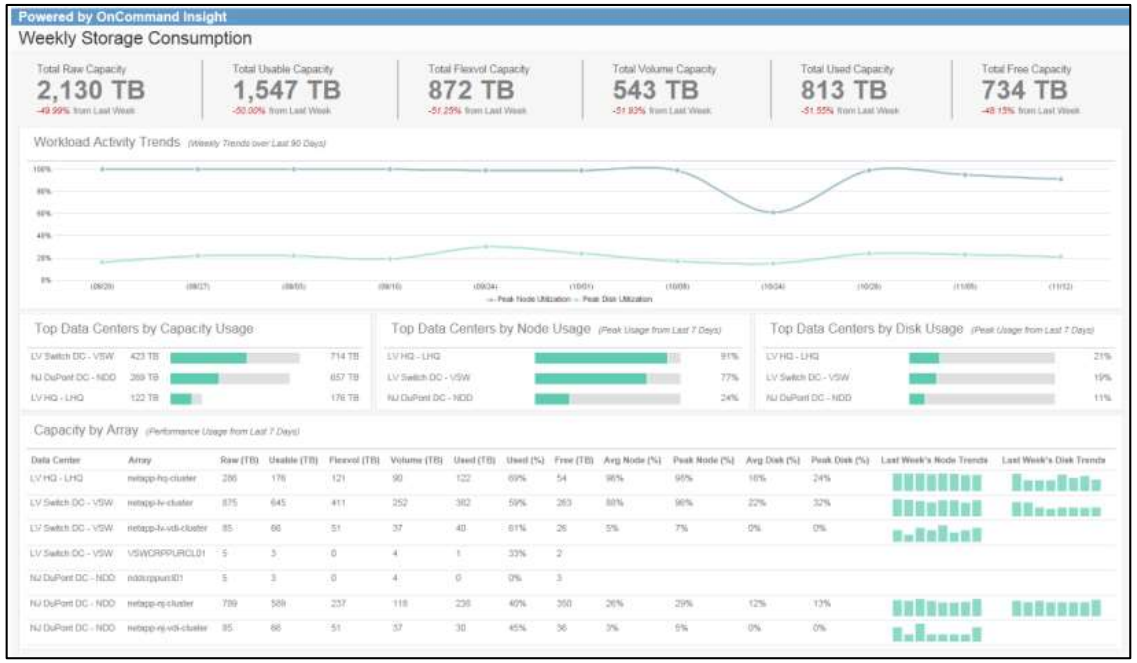
2.34 Weekly Storage Consumption

Description: NetApp Node dashboard showing high level capacity metrics for the selected location, node performance utilization and top 10 volumes identified as a 'potential resource contention' device. Maps on right show Data Center location by state/country and major city with Usable Capacity values.

Prerequisites: Requires Data Center annotation. SQL code updated with State-Country-City definitions (which are easily mapped to Data Center). Maps support all regions of the world. Requires licenses for OCI Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Node	Name of the Storage Node as reported by the NetApp Cluster discovered by OCI.
Volume	Name of the Internal Volume (FlexVol) associated with the Storage Node.
Data Center	Data Center location annotation configured in OCI and assigned to the Storage Node.
Total Capacity (TB)	Post-RAID, Total Usable Capacity in TB as reported by the Aggregate associated with the Storage Node.
Used Capacity (TB)	Used Capacity in TB, if thin provisioned, then data written, if thick provisioned with space guarantee = true, then same as Usable.
Total Allocated (TB)	Total Allocated in TB which is provisioned to Storage Initiators or NFS Shares presented to hosts via IP.
Subscription %	Total Allocated in TB / Usable Capacity in TB for thin provisioned volumes.
Avg Utilization	Average CPU Utilization as reported by the Storage Node.
Peak Utilization	Peak CPU Utilization as reported by the Storage Node.
IOpS Deviation	Using the built-in Deviation function, shows highest Total IOpS deviation from a 14 day hourly average. Identifies potential resource contention in the storage aggregate.

 Click on the report screen shot above to view an enlarged image.

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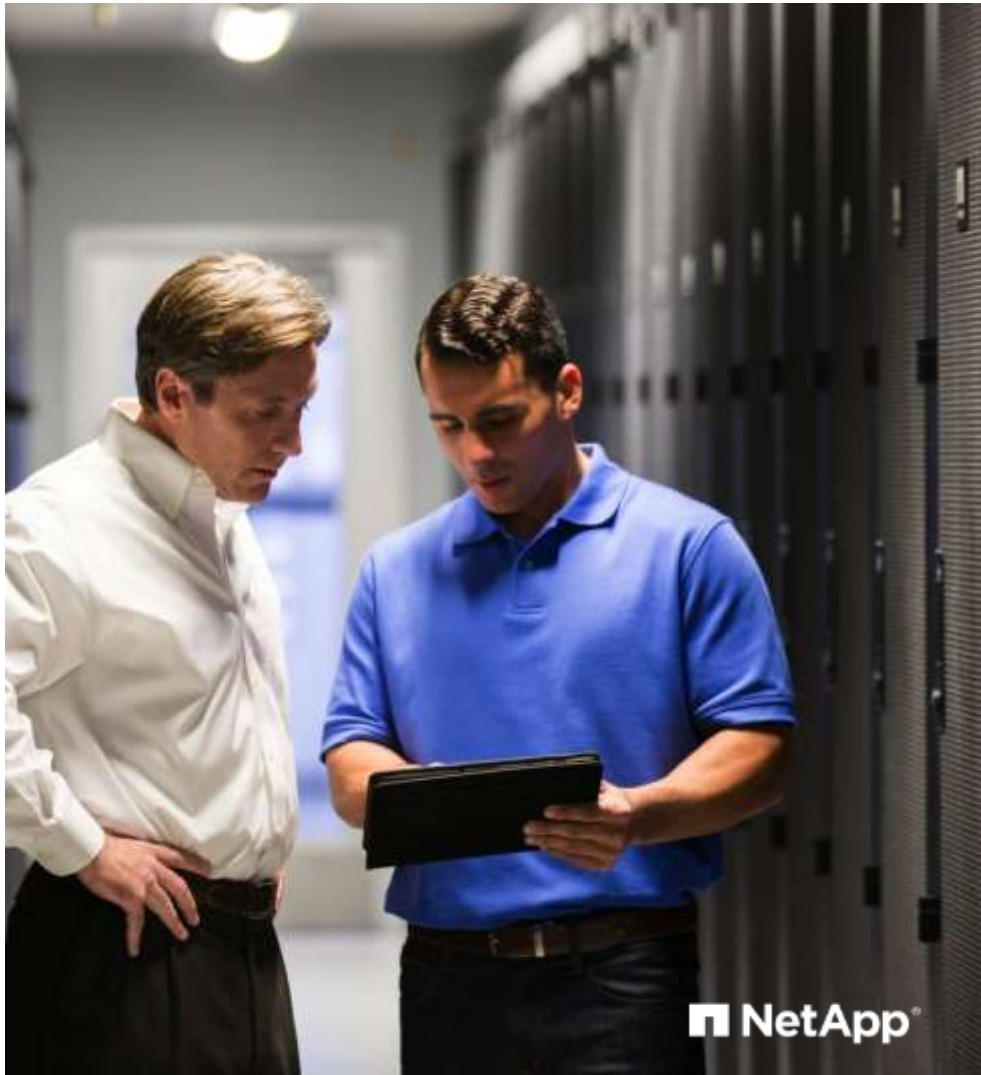
Performance Management Overview

These are some of the day-to-day and monthly performance management tasks that can be addressed by leveraging the performance based reports in this catalog. Here are some of the objectives met by this section:

- Storage performance trends
- Manage tiering with I/O density reports
- Manage storage sizing and head room
- Analyze service level objectives for performance
- Compare actual vs. planned
- Manage application load
- Manage underutilized and over utilized storage by performance
- Manage performance thresholds

* Any modifications to the Data Dictionary for the reports shown will require a custom report.



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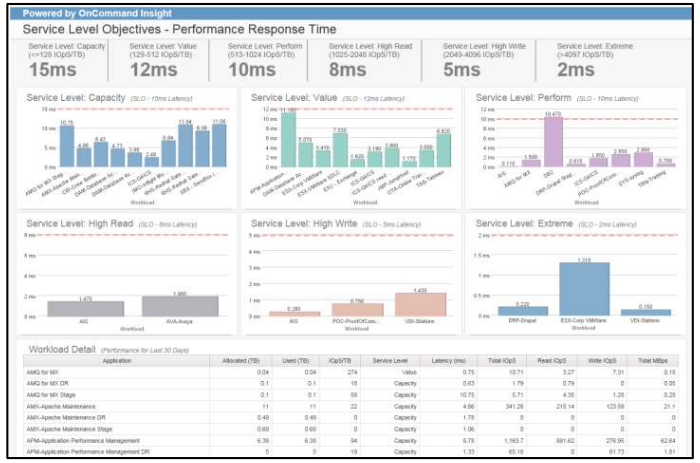
3.1 Service Level Objectives – Performance Response Time

Description: This dashboard shows Service Level Objectives for Latency / Response time metrics. The idea is to show each Service Level, as defined in OCI and based on IOpS/TB (IO Density) ranges, the latency thresholds for each IOpS range as agreed upon with storage customers. Each Service Level and latency threshold value is displayed at the top of the page. Six column charts are displayed showing each Service Level and Application/Workload average latency metrics that may or may not breach the service threshold for each range. A workload/application detail list is displayed with capacity and performance metrics. This report has been designed for Internal Volumes ONLY. It can easily be modified to include SAN volumes as well.

Prerequisites: Annotations/definitions are necessary for Application and Service Level/Tier. Requires secondary ETL script to run nightly. There is a Non-ETL version as well. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Application/Workload	OCI configured annotation. Defines the Application associated with host or internal volume capacity.
Service Level	Based on IOpS/TB –Service Level DEFAULTS are defined as follows: • Capacity = IOpS/TB < 128 • Value = IOpS/TB < 512 • Performance = IOpS/TB < 1024 • High Read = IOpS/TB < 2048 • High Write = IOpS/TB < 4096 • Extreme = IOpS/TB > 4096
Latency	Average Daily Latency in milliseconds collected for a period of 30 days.
Allocated (TB)	Internal Volume Allocated capacity in TB assigned to a workload or Application in OCI as reported by the storage device monitored by OCI. Data is contained in the Internal Volume Capacity Fact table.
Used (TB)	Internal Volume Used capacity in TB assigned to a workload or Application in OCI as reported by the storage device monitored by OCI. Data is contained in the Internal Volume Capacity Fact table.
IOpS/TB	Average Daily IOpS/TB (IO Density) collected for a period of 30 days.
Total IOpS	Average Daily IOpS (both Read and Write) collected for a period of 30 days.
Read IOpS	Average Daily Read IOpS collected for a period of 30 days.
Write IOpS	Average Daily Write IOpS collected for a period of 30 days.
Total MBps	Average Daily Throughput in MB/sec (both Read and Write) collected for a period of 30 days.

 Click on the report screen shot above to view an enlarged image.

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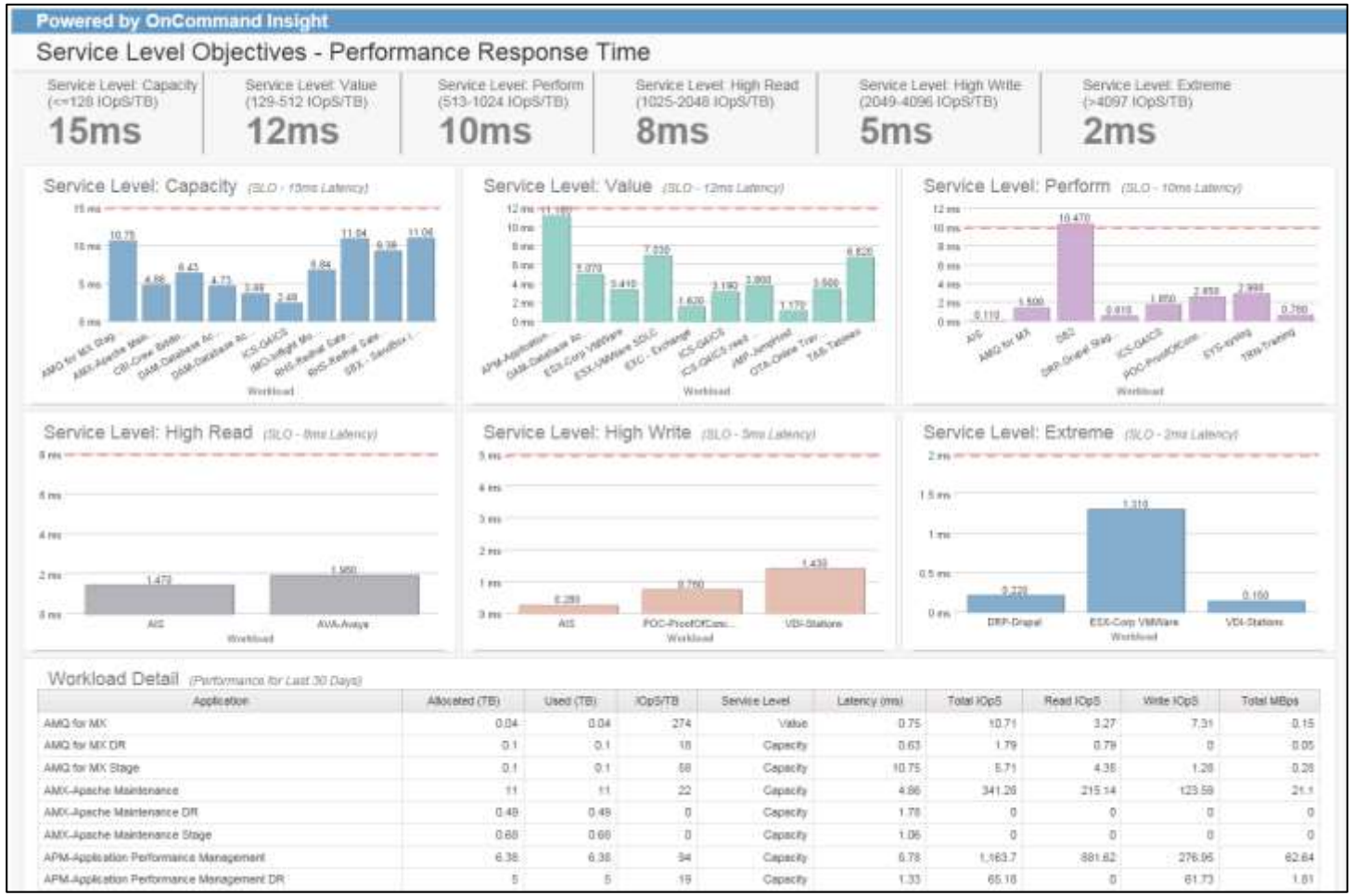
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



 Click on the screen shot above to return to the report description.

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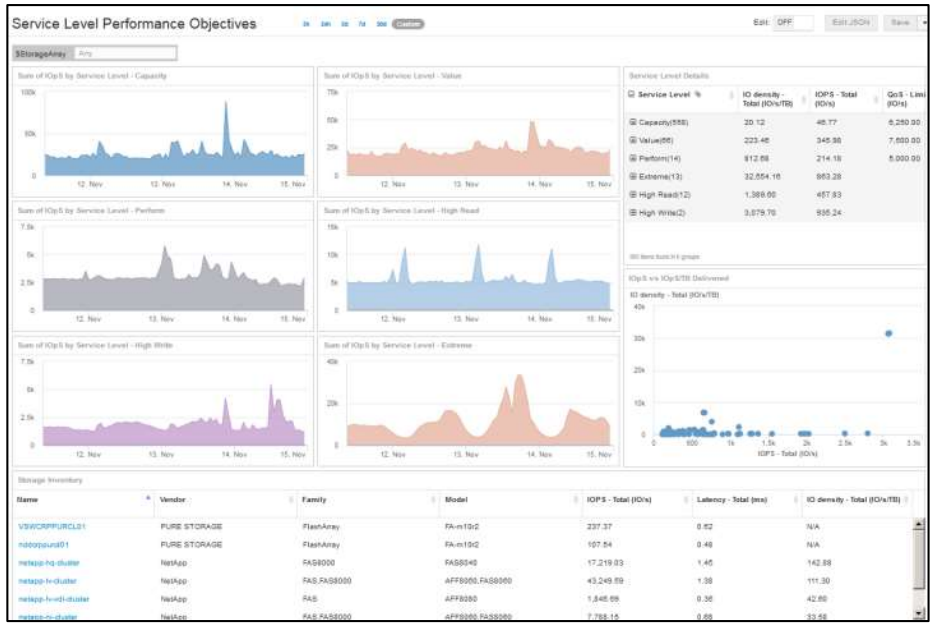
3.1 WebUI – Service Level Performance Objectives

Description: This WebUI based dashboard shows the state of Service Level Performance Objectives. Service Levels are defined in OCI and based on IOpS/TB (IO Density) ranges. The dashboard focuses on IOPS trends by Service Level, includes IOpS vs IOpS/TB delivered bubble chart, Service Level details and Storage Inventory with performance metrics.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Array/Name	Name of the storage array monitored by OCI.
Service Level	Based on IOpS/TB –Service Level DEFAULTS are defined as follows: • Capacity = IOpS/TB < 128 • Value = IOpS/TB < 512 • Performance = IOpS/TB < 1024 • High Read = IOpS/TB < 2048 • High Write = IOpS/TB < 4096 • Extreme = IOpS/TB > 4096
Vendor	Name of the Manufacturer associated with the storage array monitored by OCI.
Family	Name of the Family associated with the storage array monitored by OCI.
Model	Name of the Model associated with the storage array monitored by OCI.
Sum of Average IOpS	Sum of Average Daily IOpS collected for the user selected time period.
IOpS/TB	IOpS/TB or IO Density collected for the user selected time period.
IOpS – Total (IO/s)	Same as Sum of Average IOpS.
Latency – Total (ms)	Average Daily Latency in milliseconds collected for the user selected time period.
IO Density – Total (IOs/TB)	Same as IOpS/TB
QoS Limit (IO/s)	QoS IOpS Limit as defined for the Flexvol workload within the NetApp Controller.

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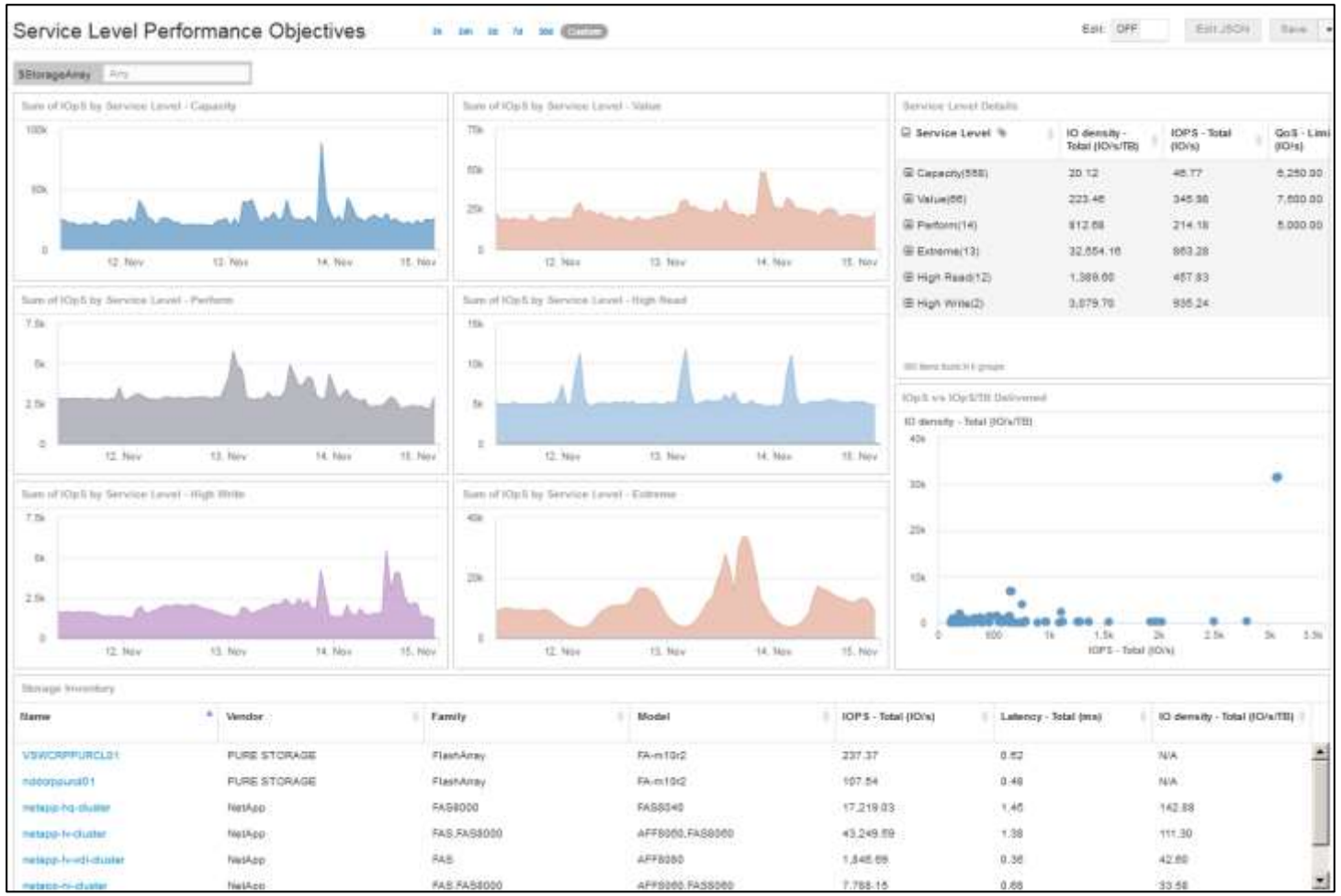
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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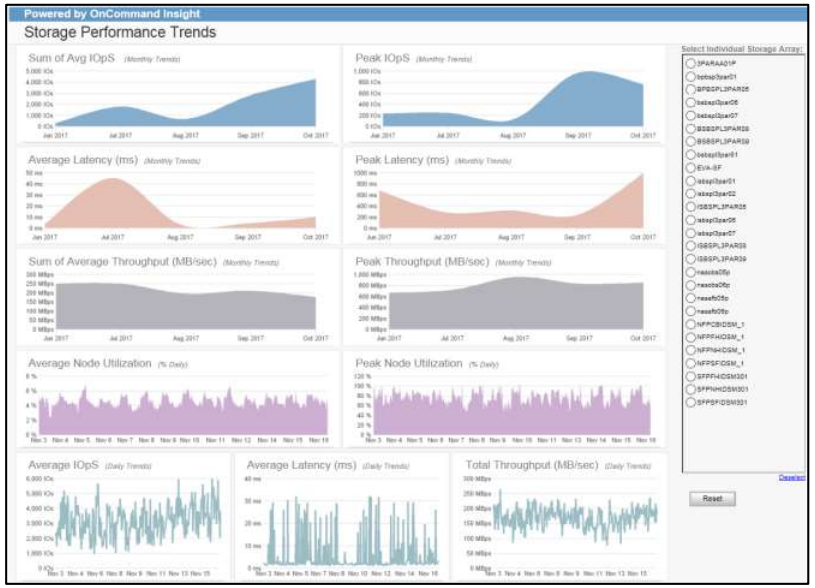
3.2 Storage Performance Trends

Description: This dashboard shows Storage Device Performance trending. A drop-down is available for interactive selection of individual storage devices. The top six (6) charts show monthly trends displaying Average and Peak IOpS with Trending, Average and Peak Latency with Trending, and Average and Peak Throughput with Trending. The remaining charts at bottom show a Daily Average and Peak including Daily CPU utilization, Daily Averages for IOpS, Daily Averages for Latency, and Daily Total Throughput.

Prerequisites: Requires secondary ETL script to run nightly. There is a Non-ETL version as well. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Array	Name of the storage array monitored by OCI.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Sum of Avg IOpS	Sum of Average Daily IOpS collected for 1 year and filtered monthly.
Peak IOpS	Peak Daily IOpS collected for 1 year and filtered monthly.
Average Latency	Average Daily Latency in milliseconds collected for 1 year and filtered monthly.
Peak Latency	Peak Latency in milliseconds collected for 1 year and filtered monthly.
Sum of Avg Throughput	Sum of Average Daily Throughput in MB/sec collected for 1 year and filtered monthly.
Peak Throughput	Peak Throughput in MB/sec collected for 1 year and filtered monthly
Average Node Utilization	Average CPU Utilization % collected hourly for a period of 14 days. For Symmetrix Arrays, this will be Average FA Port Utilization %.
Peak Node Utilization	Peak CPU Utilization % collected hourly for a period of 14 days. For Symmetrix Arrays, this will be Peak FA Port Utilization %.
Average IOpS	Sum of Average Daily IOpS collected for 14 days..
Average Latency	Average Daily Latency in milliseconds collected for 14 days..
Total Throughput	Sum of Average Daily Throughput in MBps collected for 14 days

 Click on the report screen shot above to view an enlarged image.

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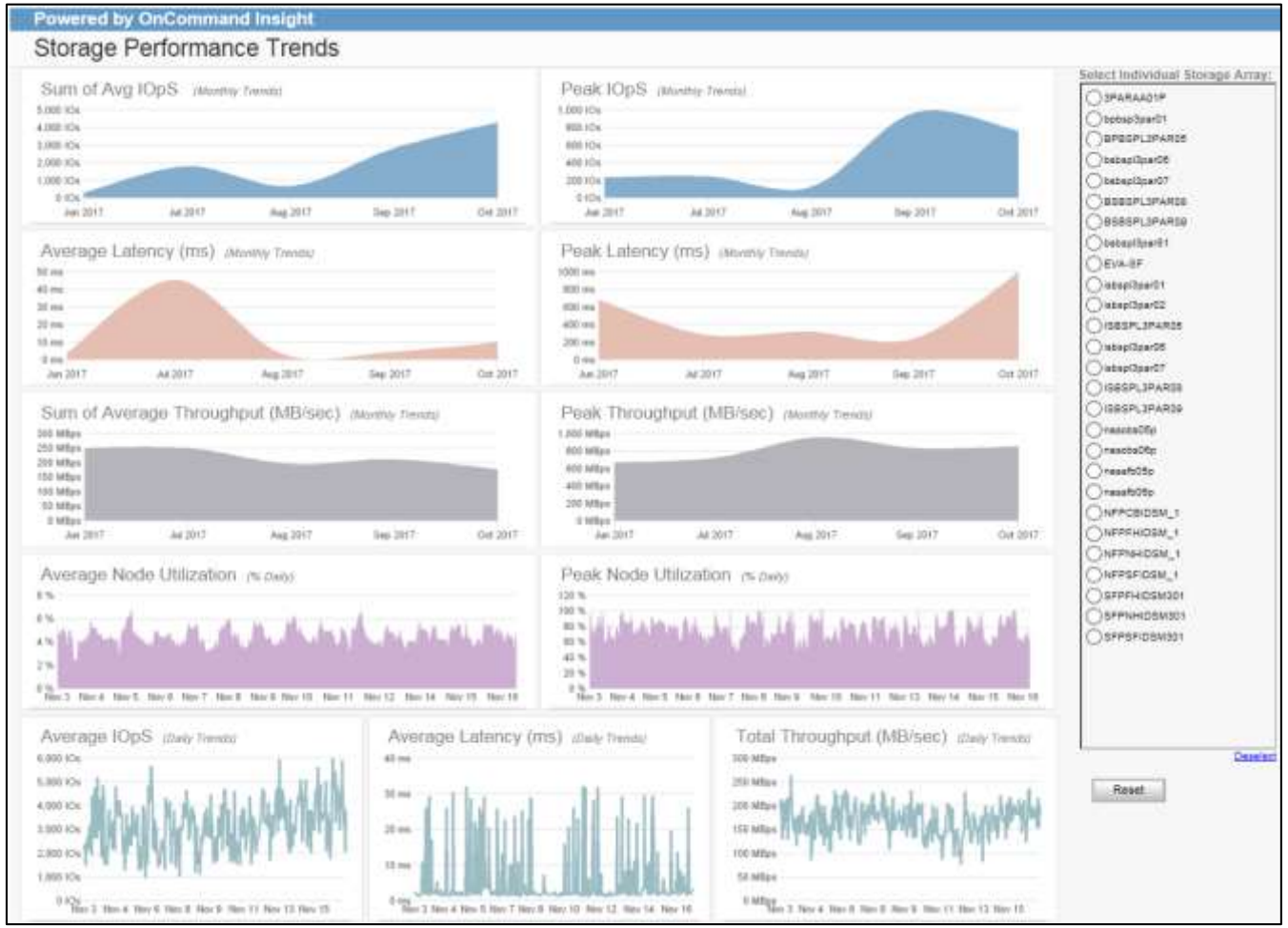
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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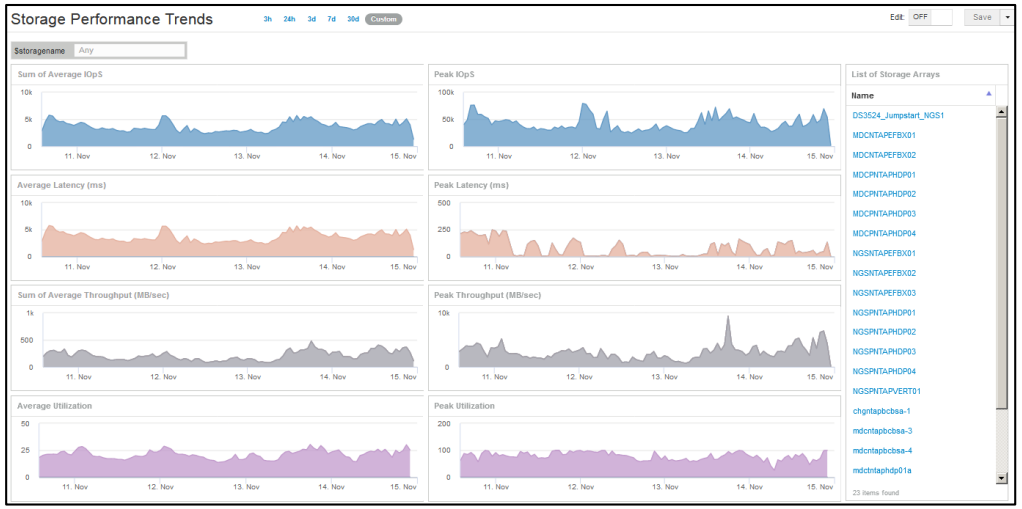
3.2 WebUI – Storage Performance Trends

Description: This WebUI based dashboard shows Storage Performance Trends over a user selected time period. Standard performance metrics trends are Sum of Average IOpS, Peak IOpS, Average Latency, Peak Latency, Sum of Average Throughput and Average and Peak Node Utilization metrics. A list of storage arrays is available on right with drill down capability. For Symmetrix Arrays, utilization will reflect Average FA Port Utilization %.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Array/Name	Name of the storage array monitored by OCI.
Date	The date field applied to trending charts and selectable by the user.
Sum of Avg IOpS	Sum of Average Daily IOpS for the user specified time period.
Peak IOpS	Peak Daily IOpS for the user specified time period.
Average Latency	Average Daily Latency in milliseconds for the user specified time period.
Peak Latency	Peak Latency in milliseconds for the user specified time period.
Sum of Avg Throughput	Sum of Average Daily Throughput in MB/sec for the user specified time period.
Peak Throughput	Peak Throughput in MB/sec for the user specified time period.
Average Utilization	Average CPU Utilization % collected hourly for a period of 14 days. For Symmetrix Arrays, this will be Average FA Port Utilization %.
Peak Utilization	Peak CPU Utilization % collected hourly for a period of 14 days. For Symmetrix Arrays, this will be Peak FA Port Utilization %.

 Click on the report screen shot above to view an enlarged image.

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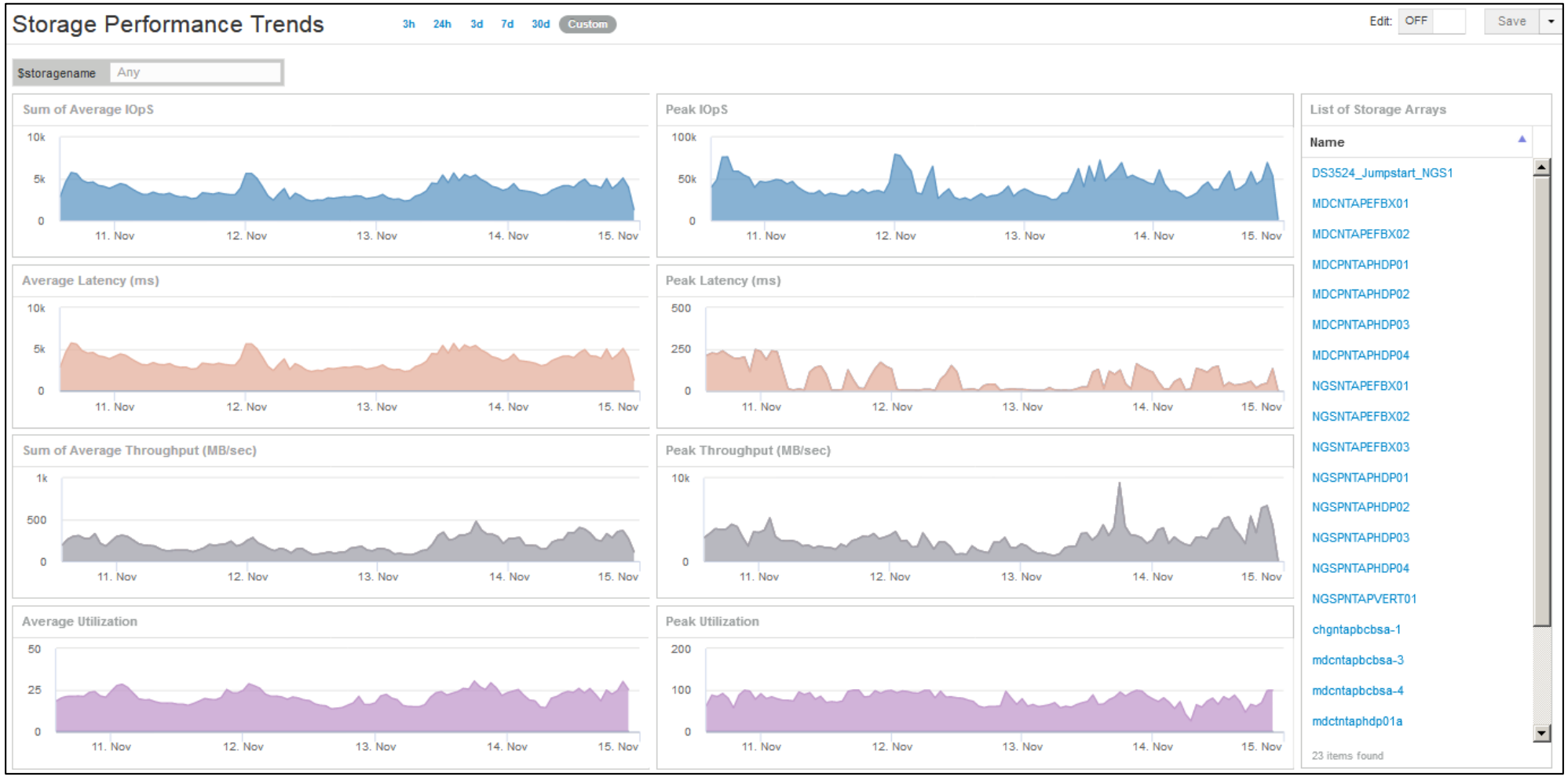

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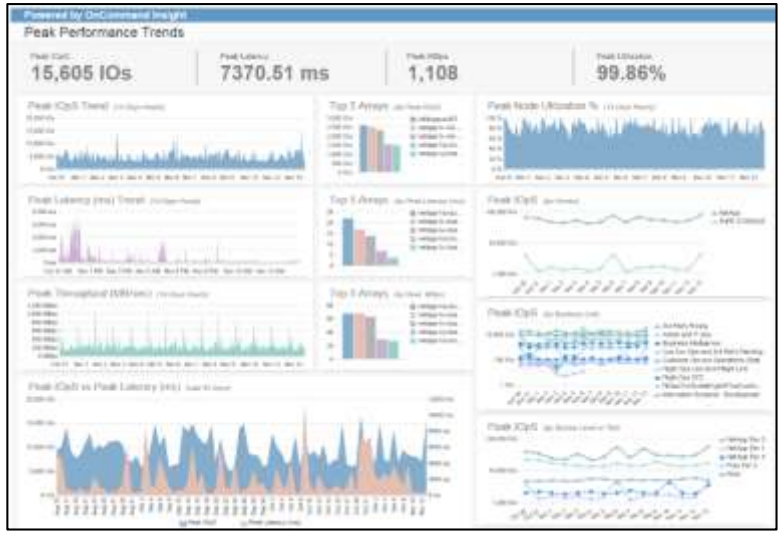
3.3 Peak Performance Trends

Description: This dashboard shows Peak Performance Trends. A drop-down (far right) is available for interactive selection of individual storage devices. From the top, peak performance metrics summary is visible. Top left shows the last 7 days for Peak IOpS with Trending, Peak Latency with Trending, and Peak Throughput with Trending. On the top right is Peak CPU Utilization for the last 7 days. The middle of the dashboard shows the Top 5 Arrays correlated to the corresponding metric on the left. On the right side, Estate Performance is shown, displaying Peak IOpS by Vendor, Business Unit, and Service Level. The bottom left chart shows Peak Performance for IOpS and Latency over the last 90 days.

Prerequisites: Annotations/definitions are necessary for Business Unit and Service Level/Tier. Requires secondary ETL script to run nightly. This is only available in OnCommand versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Business Unit	OCI configured annotation. Defines Business Unit associated with host or internal volume capacity.
Tier	OCI configured annotation. Defines tiers of storage or Service Levels based on disk type, disk speed, or IOpS/TB.
Storage Array	Name of the storage array monitored by OCI.
Vendor	Name of the Manufacturer associated with the storage array monitored by OCI.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Peak IOpS	Peak Hourly IOpS collected for 14 days (also shown at bottom collected DAILY for 90 days)
Peak Latency	Peak Hourly Response Time (Latency) in milliseconds collected for 14 days (also shown at bottom collected DAILY for 90 days).
Peak MBps	Peak Hourly Throughput in MB/sec collected for 14 days.
Peak Node Utilization	Peak CPU Utilization % collected hourly for a period of 14 days. For Symmetrix Arrays, this will be Peak FA Port Utilization %.

 Click on the report screen shot above to view an enlarged image.

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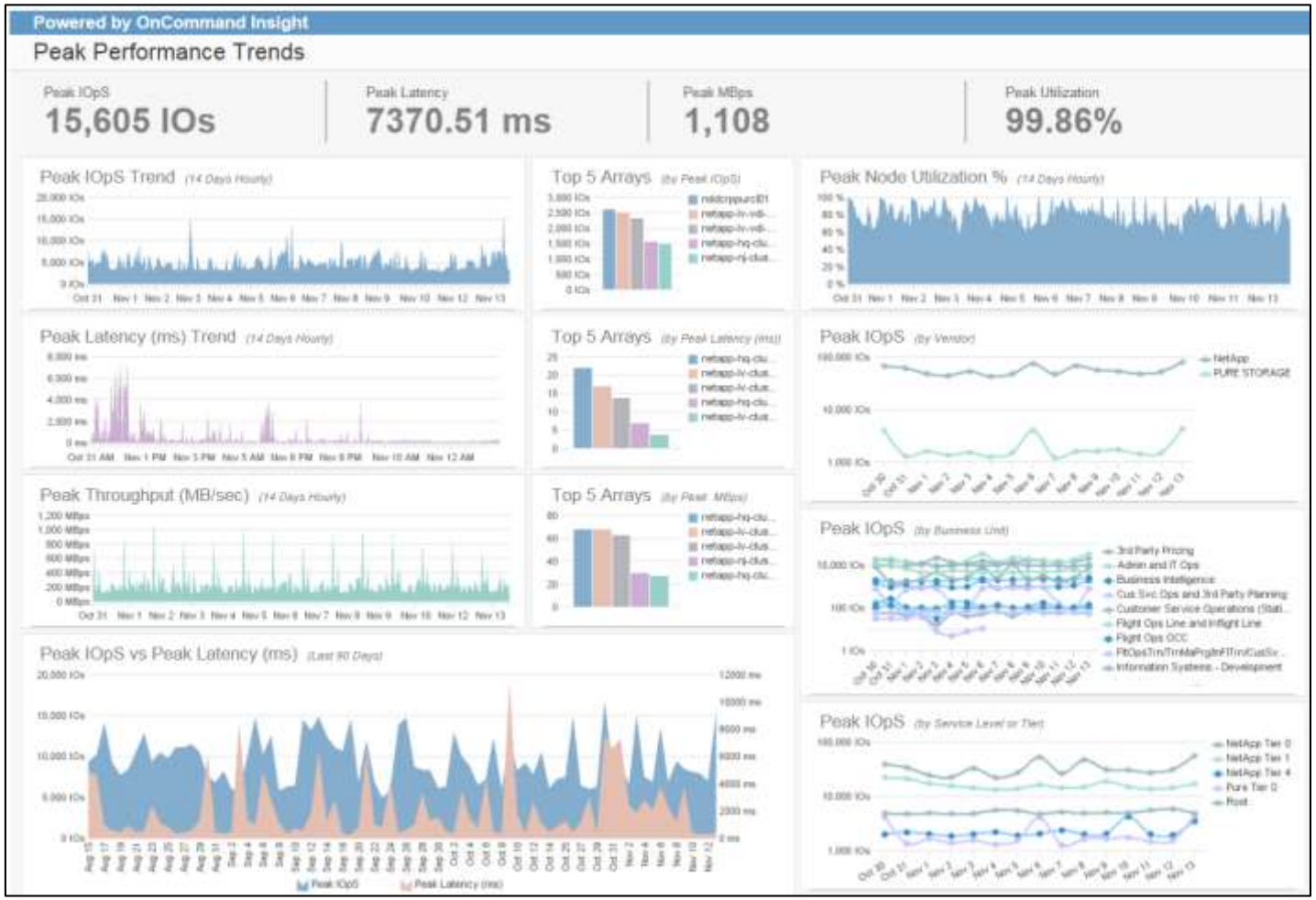
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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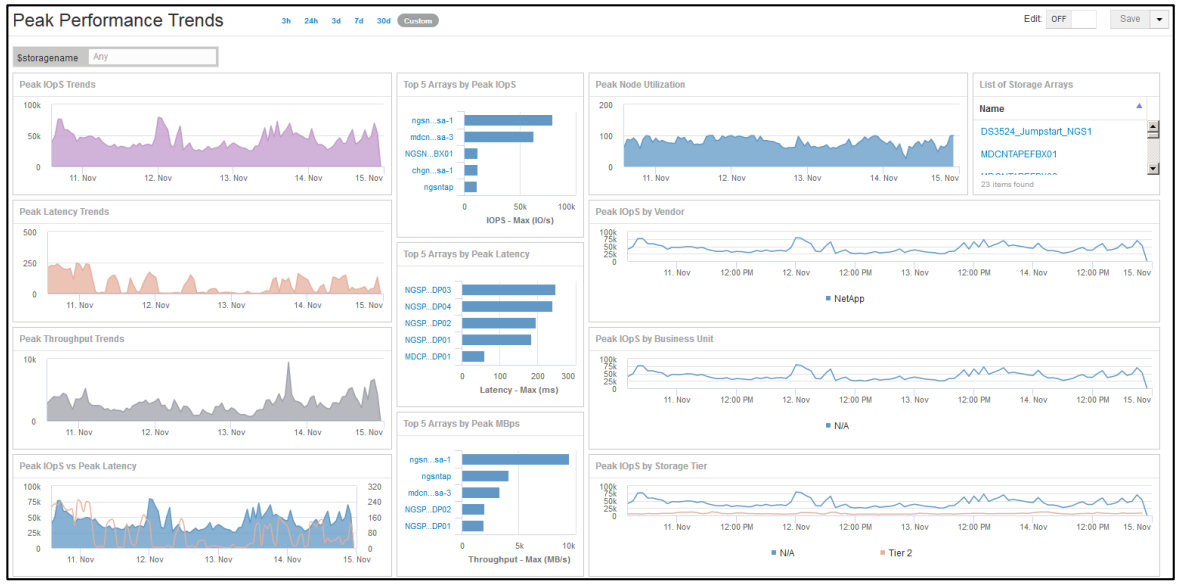
3.3 WebUI – Peak Performance Trends

Description: This WebUI based dashboard shows Peak Storage Performance Trends over a user selected time period. Peak performance metrics trends include Peak IOpS, Peak Latency, Peak Throughput and Node Utilization. A list of storage arrays is available on top right with drill down capability. For Symmetrix Arrays, utilization will reflect Average FA Port Utilization %.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Business Unit	OCI configured annotation. Defines Business Unit associated with host or internal volume capacity.
Tier	OCI configured annotation. Defines tiers of storage or Service Levels based on disk type, disk speed, or IOpS/TB.
Storage Array	Name of the storage array monitored by OCI.
$storagename	Dashboard Variable used to filter for select storage devices.
Vendor	Name of the Manufacturer associated with the storage array monitored by OCI.
Date	The date field applied to trending charts and selectable by the user.
Peak IOpS	Peak Hourly IOpS collected for the user specified time period.
Peak Latency	Peak Hourly Response Time (Latency) in milliseconds for the user specified time period.
Peak MBps	Peak Hourly Throughput in MB/sec for the user specified time period.
Peak Node Utilization	Peak CPU Utilization % for the user specified time period. For Symmetrix Arrays, this will be Peak FA Port Utilization %.

 Click on the report screen shot above to view an enlarged image.

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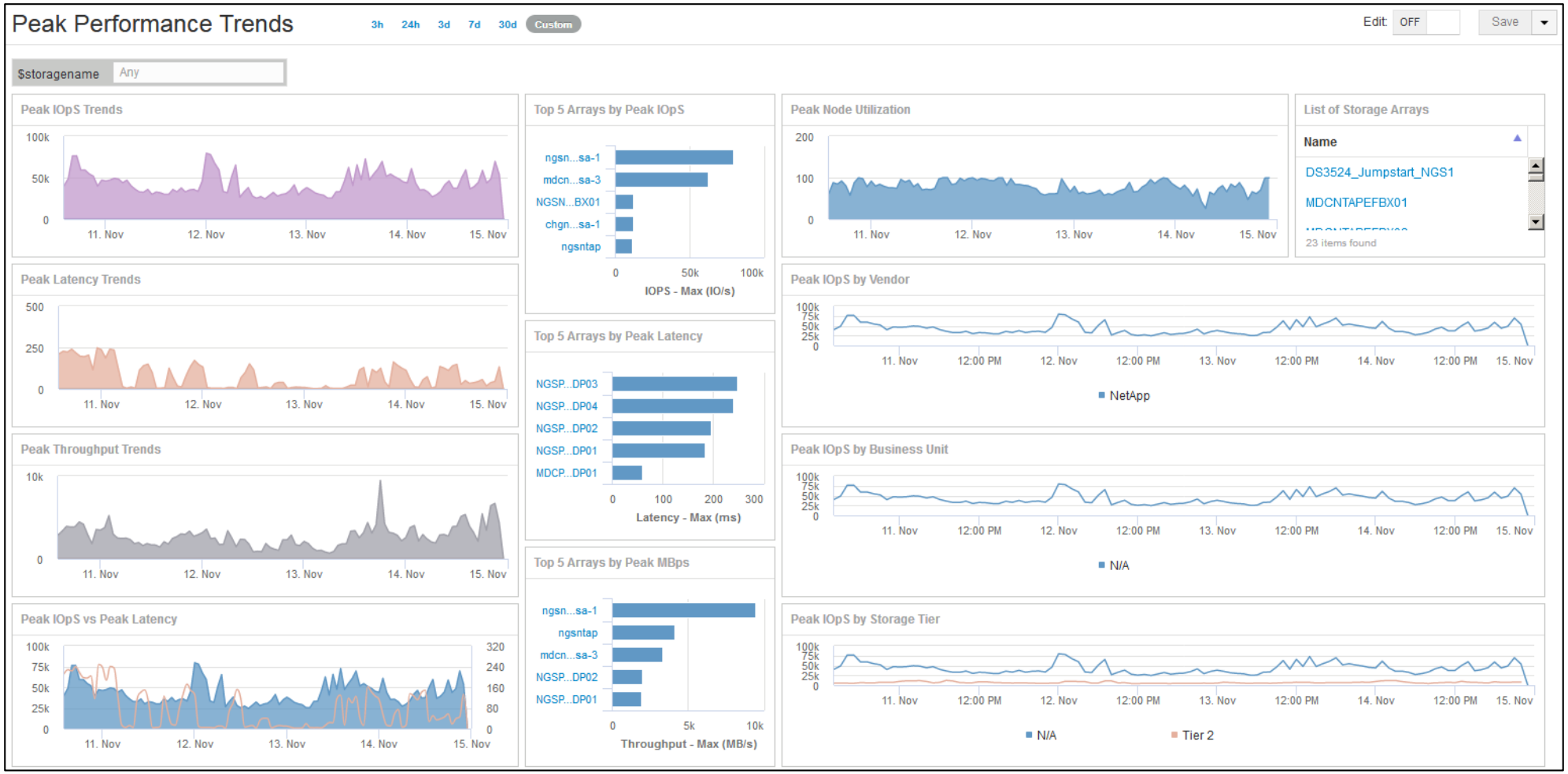
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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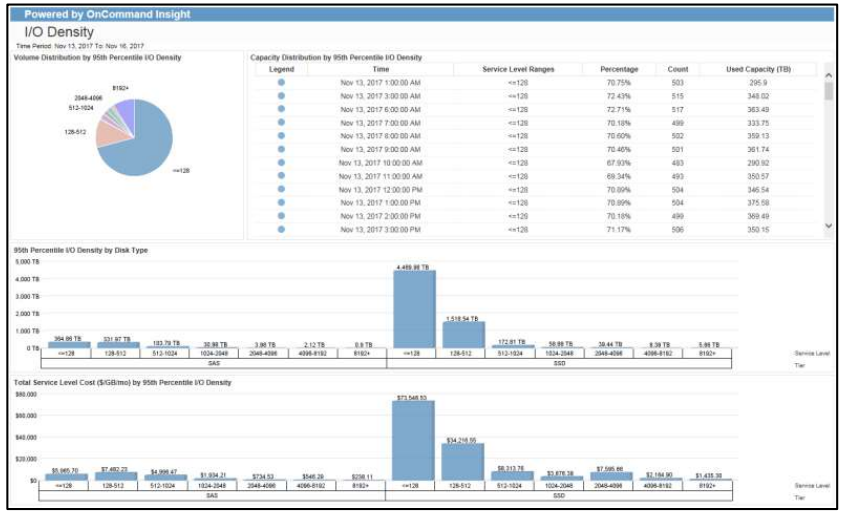
3.5 IO Density with Date and Time Prompts

Description: This dashboard depicts I/O Density or IOpS/TB. I/O Density (commonly accepted calculation as I/O's divided by Gigabytes or Terabytes) helps identify Performance per Gigabyte or Terabyte across Volumes or Storage Pools to determine the appropriate Tier of storage (Disk Type) to be used for Applications and Workloads in order to achieve optimal performance. The report enables the user to EXCLUDE certain hours of the day or to choose a particular Date Range.

Prerequisites: Annotations/definitions are necessary for Service Level/Tier. This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Tier	OCI configured annotation. Defines tiers of storage based on disk type, disk speed, etc.
Service Level	Based on IOpS/TB –Service Level DEFAULTS are defined as follows: • Capacity = IOpS/TB < 128 • Value = IOpS/TB < 512 • Performance = IOpS/TB < 1024 • High Read = IOpS/TB < 2048 • High Write = IOpS/TB < 4096 • Extreme = IOpS/TB > 4096
IO Density	95th percentile of Max Total IOpS (both read and write) / Used Capacity (GB)
IO Density Ranges	For IO Density value, <=128, between 128 and 256, between 256 and 1024, and 6144+
Cost	NOT an OCI configured annotation. For this report, static values for disk type and embedded into the report directly. E.g. SATA=.022, FC or SAS= .061, SSD=.248
Disk Type	The type of disk, e.g. SAS, SSD, SATA, FC
Percentage	Volume Capacity distribution based on 95th percentile of IO Density
Count	Volume count
Used Capacity (GB)	Capacity used in an internal volume as reported by the storage array in GB. Includes capacity used for snapshots.
Service Level Cost	For this report, IO Density <=128 then cost=.016, IO Density <=512 cost=.022, IO Density <=1024 cost=.047, IO Density <=2048 cost=.061, IO Density <=4096 cost=.187, IO Density <=8192 cost=.248
Total Service Level Cost	Same as above * Used Capacity (GB)
Storage Tier Cost	Same as Cost.
Realigned Tier Cost	For this report, IO Density <=512, realigned cost = .016, IO Density <=4096, realigned cost = .047, all other realigned cost = .187
Total Realigned Tier Cost	Same as above * Used Capacity (GB)
Total Tier Cost	Used Capacity (GB) * Cost
Total Realigned Service Level Cost	Used Capacity (GB) * (IO Density <=512, .016, IO Density <=4096, .047, IO Density <=8192, .187)
Total Realignment Savings	Total Tier Cost – Total Realigned Service Level Cost
Peak IOPS 95th Percentile by Volume	Extraction of Peak IOPs metric by using 95/100 * COUNT(*)+1 within a substring_index function in SQL.

 Click on the report screen shot above to view an enlarged image.

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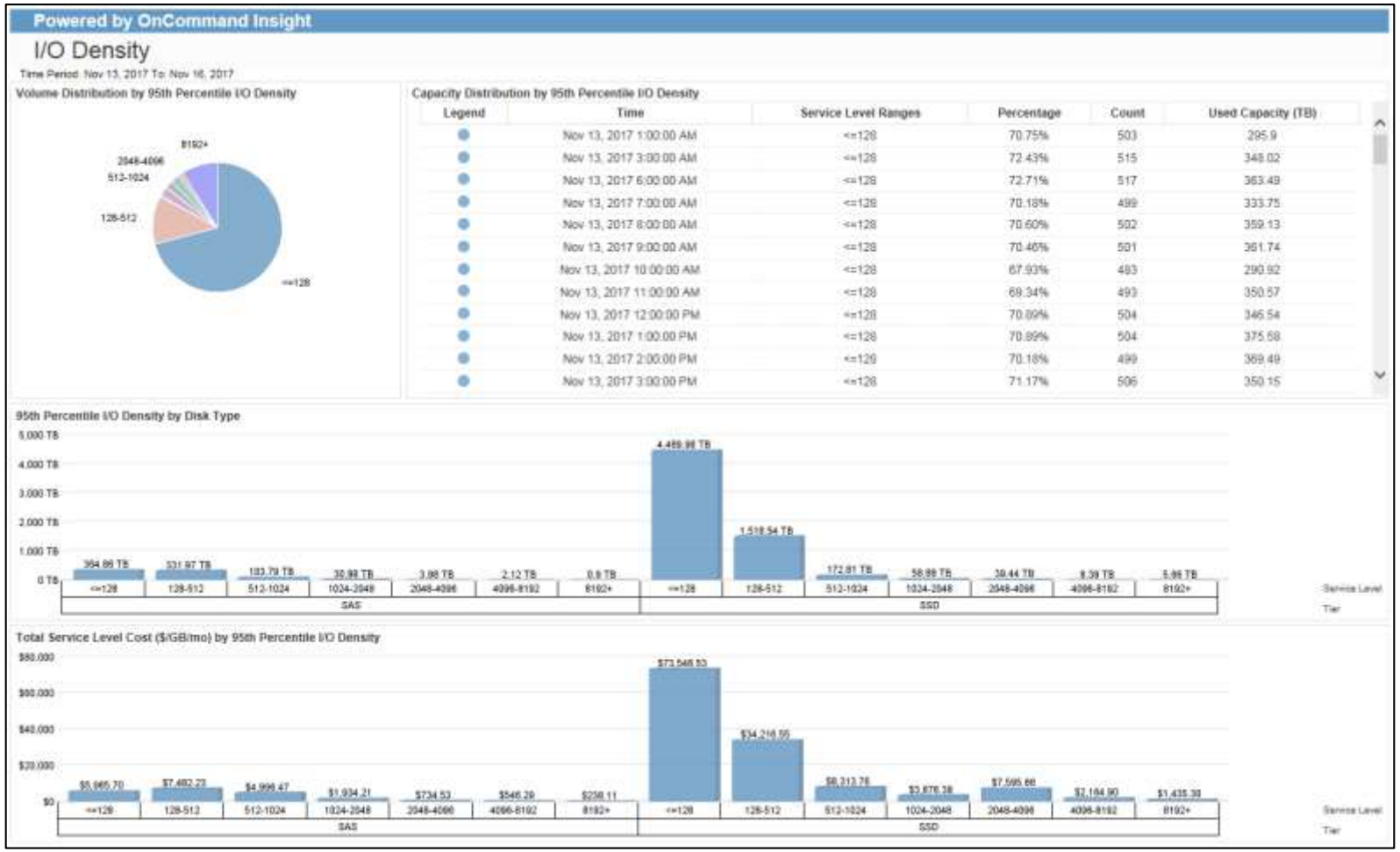
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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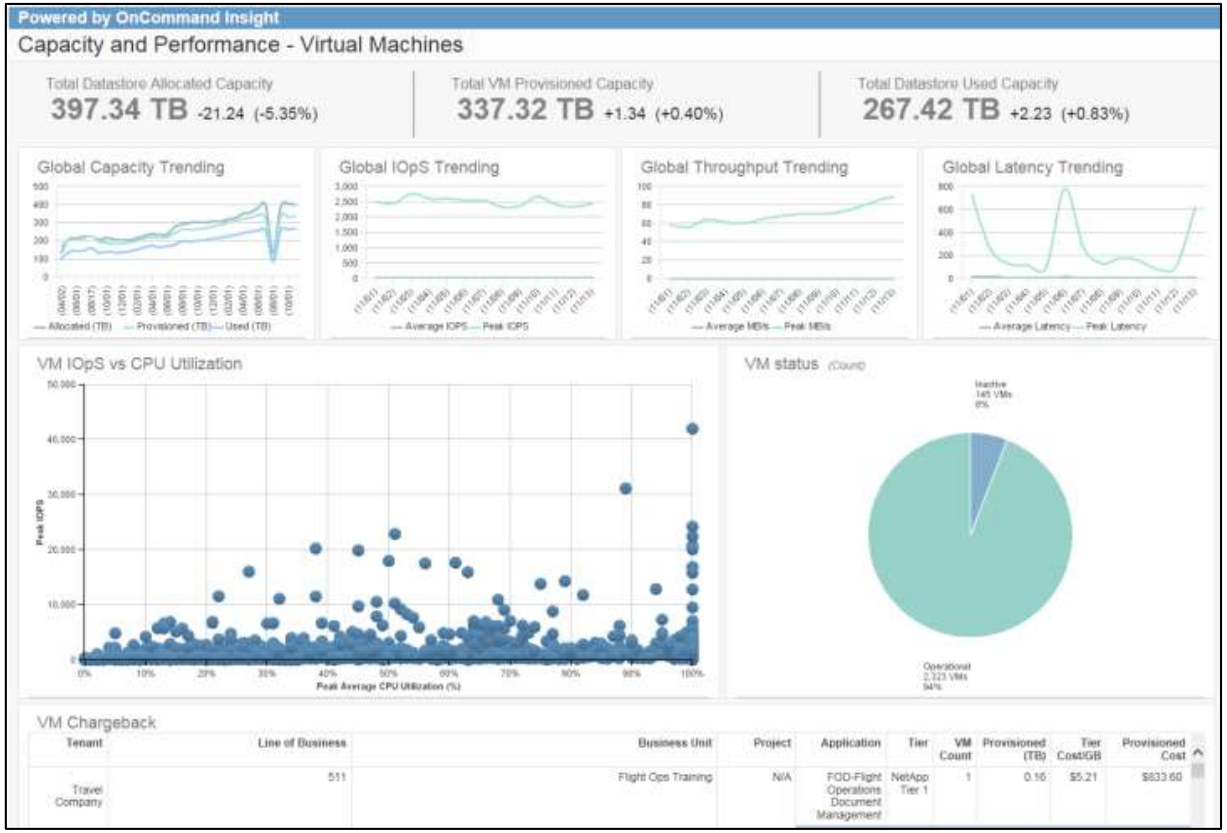
3.6 Capacity and Performance – Virtual Machines (Page 1 of 2)

Description: This dashboard shows Capacity and Performance relative to Virtual Machines (VM's). The shows Total Datastore Allocated Capacity; Total VM Capacity Provisioned; and Total Datastore Used Capacity. The middle section shows VM IOpS vs CPU Utilization (each blue dot is a VM) and to the right overall VM Status (Operational; Idle; Inactive). The bottom displays VM Chargeback by Application; Tier; VM Count; Provisioned; Tier Costs/GB; and overall Provisioned Cost.

Prerequisites: Annotations/definitions are necessary for Costs, Application, Tenant, Line of Business, Business Unit, Project and Service Level/Tier. This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

See next page

 Click on the report screen shot above to view an enlarged image.

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3.6 Capacity and Performance – Virtual Machines (Page 2 of 2)

Data Dictionary

☐ **Select This Report**

Field	Description
Tier	OCI configured annotation. Defines tiers of storage based on disk type, disk speed, storage array or pool, etc.
Tenant	OCI configured annotation. Defines the tenant associated with host or internal volume capacity.
Business Unit	OCI configured annotation. Defines the business unit associated with host or internal volume capacity.
Line of Business	OCI configured annotation. Defines the line of business associated with host or internal volume capacity.
Project	OCI configured annotation. Defines the line of project with host or internal volume capacity.
Application	OCI configured annotation. Defines the application with host or internal volume capacity.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
VM	Name of the Virtual Machine monitored by OCI. This field is shown when clicking on indivdiual bubbles on the bubble chart.
VM Count	Number of virtual machines as reported by the Vcenter discovered by OCI.
VM State	The state of the virtual machine. E.g. running, not-running, etc.
Total Datastore Allocated Capacity (TB)	Total capacity in (TB) allocated to the datastore.
Total VM Provisioned Capacity (TB)	Total capacity in (TB) provisioned to virtual machines.
Total Datastore Used (TB)	Total datastore used in (TB) by virtual machines.
Change in Allocated (TB)	Difference in Total Datastore Allocated between current and previous month.

Field	Description
Change in Allocated (%)	Latest datastore allocated – previous month datastore allocated / latest datastore allocated.
Change in Provisioned (TB)	Difference in VM provisioned capacity between current and previous month.
Change in Provisioned (%)	Latest provisioned – previous month provisioned / latest provisioned.
Change in Datastore Used (TB)	Difference in datastore used capacity between current and previous month.
Change in Datastore (%)	Latest datastore used – previous month datastore used / latest datastore used.
Average IOpS	Total IOpS (both read and write) averaged daily for 14 days.
Peak IOpS	Maximum Total IOpS daily for 14 days.
Average MB/s	Total Throughput in MB/second (both read and write) averaged daily for 14 days.
Peak MB/s	Maximum Total Throughput in MB/second (both read and write) daily for 14 days.
Peak Average CPU Utilization %	Maximum CPU Utilization % for the Virtual Machine averaged daily for 14 days.
Provisioned (TB)	Capacity in TB provisioned to Virtual Machines.
Tier Cost/GB	OCI configured annotation. Defines the cost per GB associated with the storage tier.
Provisioned Cost	(Provisioned (TB)*1024) * Tier Cost/GB

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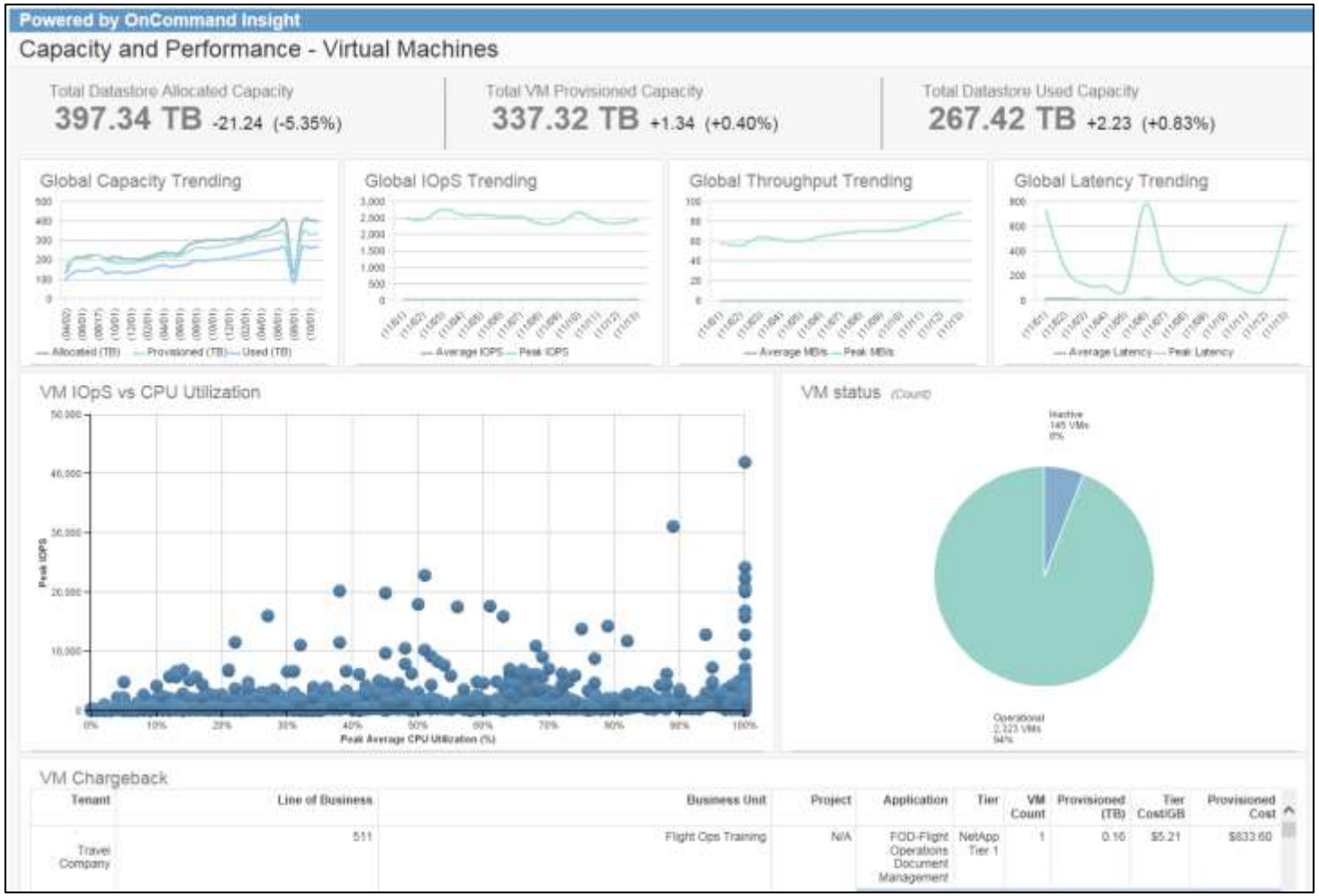
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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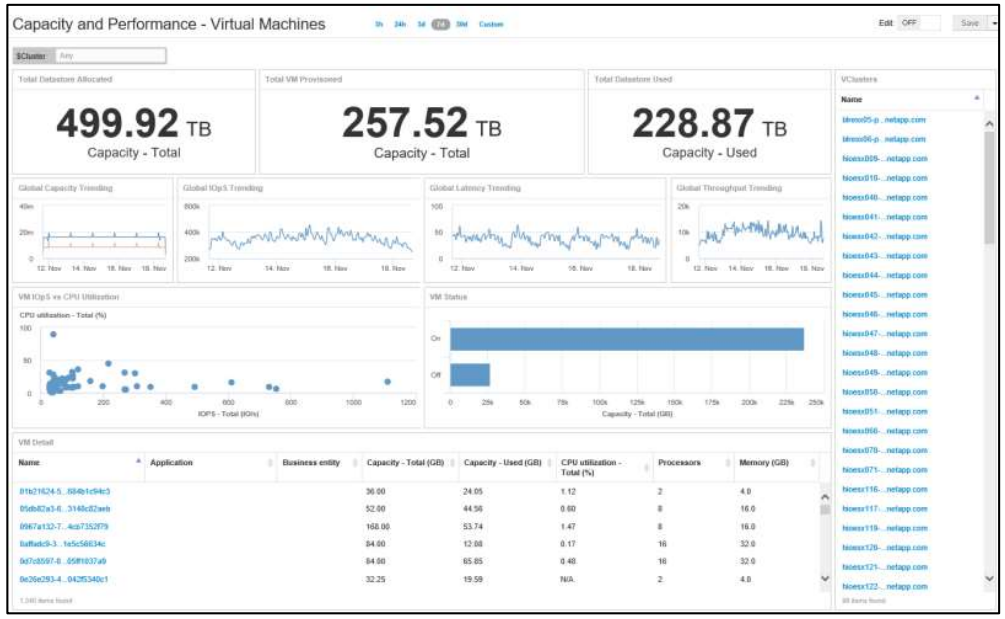
3.6 WebUI – Capacity and Performance – Virtual Machines

Description: This WebUI based dashboard shows Capacity and Performance for Virtual Machines over a user selected time period. Standard performance metrics trends are Sum of Average IOpS, Latency, Sum of Average Throughput and CPU Utilization metrics. A list of vClusters is available on right with drill down capability.

Prerequisites: Requires access to the OCI WebUI. Annotations/definitions are necessary for Application, Business Entities like Tenant, Line of Business, Business Unit, or Project. This is only available in OnCommand Insight versions 7.3.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
vCluster	Name of the vCluster monitored by OCI and containing Virtual Machines.
$Cluster	OCI dashboard variable enabled the user to select and filter on individual vClusters.
VM Guest / Name	Name of the Virtual Machine associated with the vCluster monitored by OCI.
Application	OCI configured annotation. Defines the application with host or internal volume capacity.
Business Entity	OCI configured annotation. Business Entity can be any of the following: Tenant, Line of Business, Business Unit or Project.
Date	The date field applied to trending charts and selectable by the user.
Total Datastore Allocated TB	Total capacity in (TB) allocated to the datastore.
Total VM Provisioned TB	Total capacity in (TB) provisioned to virtual machines from a datastore.
Total Datastore Used TB	Total datastore used in (TB) by virtual machines.
Capacity – Total (GB)	Virtual Machine provisioned capacity in GB from a datastore.
Capacity – Used (GB)	Virtual Machine used capacity in GB. If capacity is thin provisioned, then this will be capacity that is written to the VMDK. If capacity is thick provisioned then used will equal allocated or Capacity – Total (GB).
CPU Utilization – Total (%)	Average CPU Utilization as reported by the VM Guest for the user selected time period.
Processors	Number of processors allocated to the Virtual Machine from the vCluster.
Memory (GB)	Amount of RAM allocated to the Virtual Machine from the vCluster.

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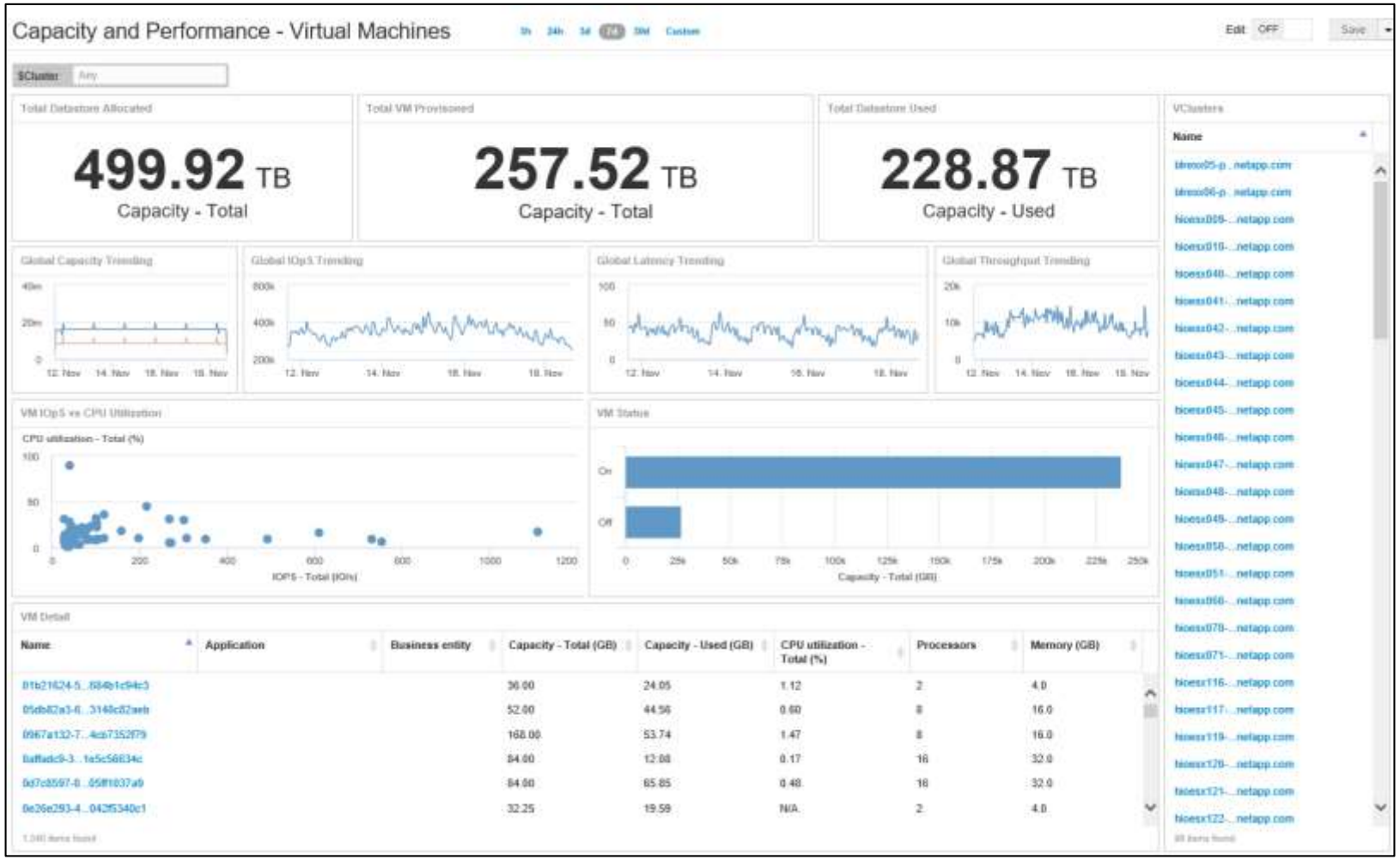
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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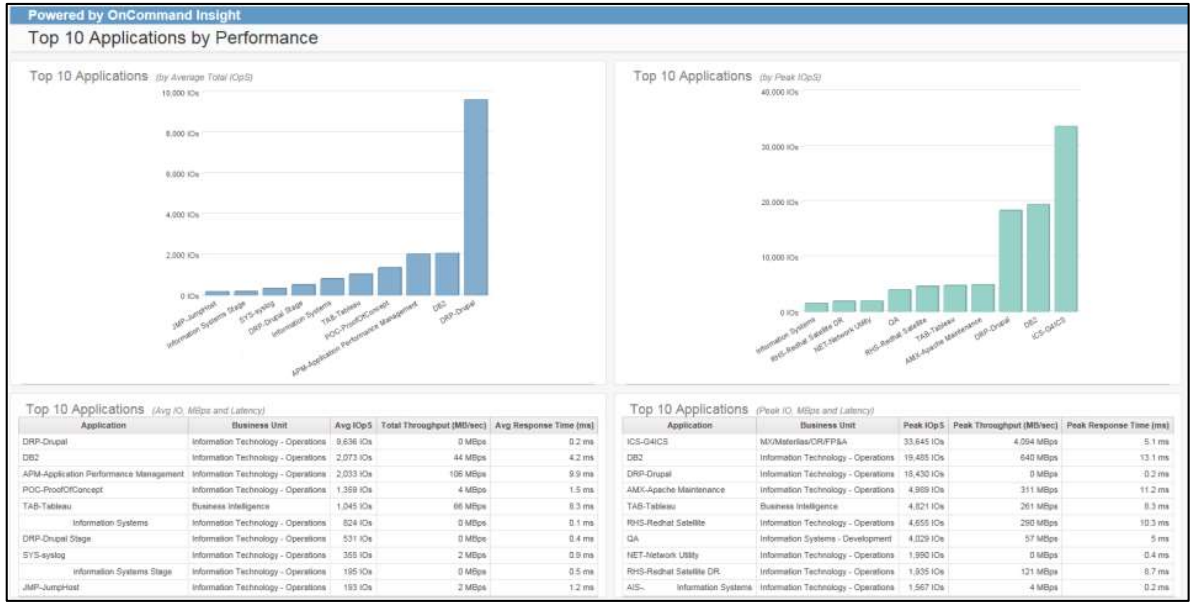
3.7 Top 10 and Bottom 10 Applications by Performance

Description: This dashboard shows Top 10 and Bottom 10 Applications based on Average and Peak Performance. On the top is shown Top 10 Application Performance displayed by Average IOpS and Peak IOpS. In the first chart across the bottom Applications are listed by Name; Business Unit; Avg IOpS; Total Throughput; and Average Response Time. The chart to the right shows Applications listed by Name; Business Unit; Peak IOpS; PeakThroughput; and Peak Response Time.

Prerequisites: Annotations/definitions are necessary for Application, and Business Unit. This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Application	OCI configured annotation. Defines the application with host or internal volume capacity.
Business Unit	OCI configured annotation. Defines the business unit associated with host or internal volume capacity.
Avg IOpS	Total IOpS (both read and write) averaged daily for 14 days.
Peak IOpS	Max Total IOpS (both read and write) daily for 14 days.
Total Throughput (MB/sec)	Total Throughput in MB/second (both read and write) averaged daily for 14 days.
Avg Response Time (ms)	Total Response Time (latency) in milliseconds (both read and write) averaged daily for 14 days.

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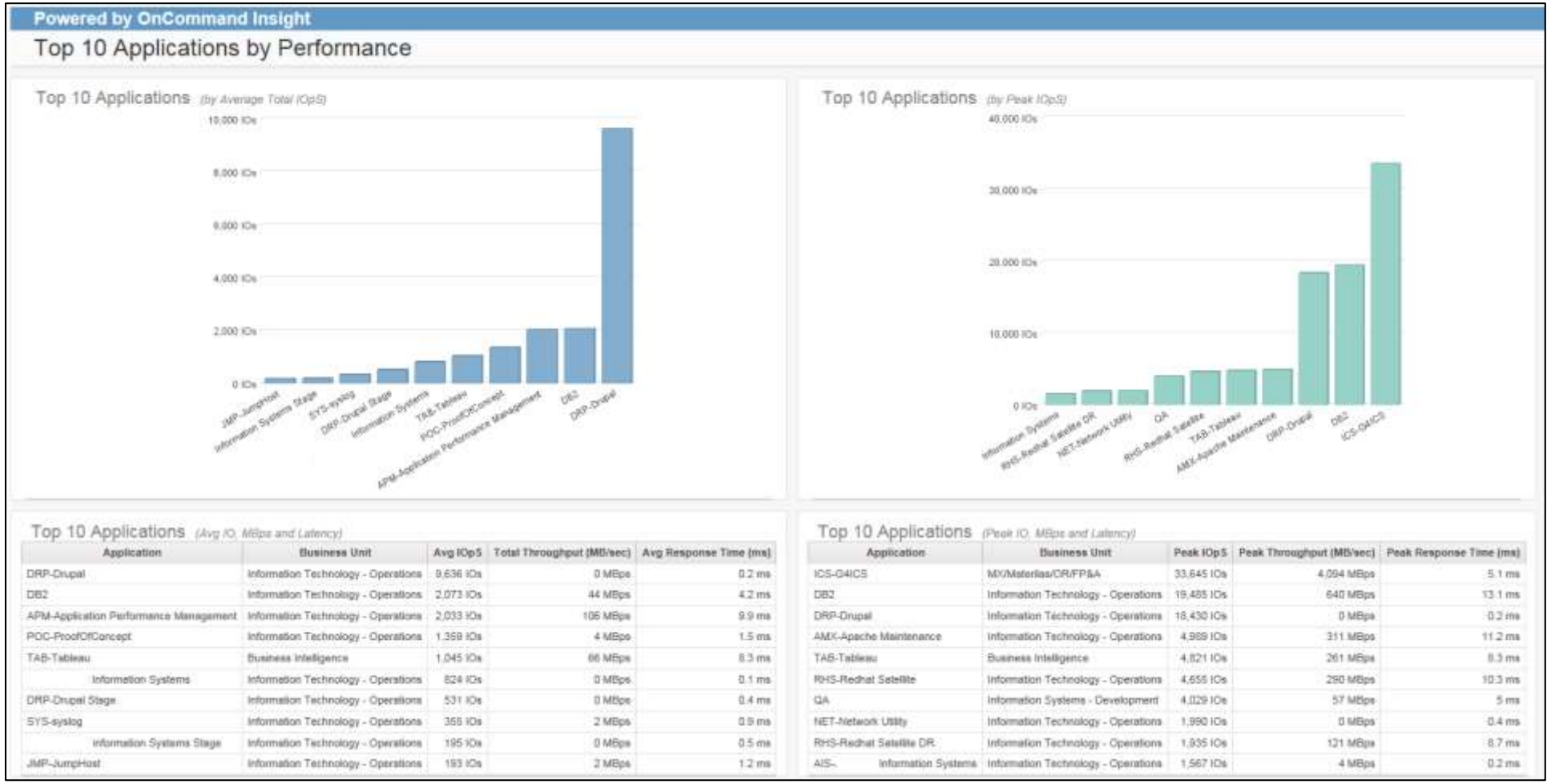
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



Application	Business Unit	Avg IOpS	Total Throughput (MB/sec)	Avg Response Time (ms)
DRP-Drupal	Information Technology - Operations	9,636 IOs	0 MBps	0.2 ms
DB2	Information Technology - Operations	2,073 IOs	44 MBps	4.2 ms
APM-Application Performance Management	Information Technology - Operations	2,033 IOs	106 MBps	9.9 ms
POC-ProofOfConcept	Information Technology - Operations	1,369 IOs	4 MBps	1.5 ms
TAB-Tableau	Business Intelligence	1,045 IOs	66 MBps	8.3 ms
Information Systems	Information Technology - Operations	824 IOs	0 MBps	0.1 ms
DRP-Drupal Stage	Information Technology - Operations	531 IOs	0 MBps	0.4 ms
SYS-syslog	Information Technology - Operations	355 IOs	2 MBps	0.9 ms
Information Systems Stage	Information Technology - Operations	195 IOs	0 MBps	0.5 ms
JMP-JumpHost	Information Technology - Operations	193 IOs	2 MBps	1.2 ms

Application	Business Unit	Peak IOpS	Peak Throughput (MB/sec)	Peak Response Time (ms)
ICS-G4ICS	MX/Materias/CR/FP&A	33,645 IOs	4,094 MBps	5.1 ms
DB2	Information Technology - Operations	19,485 IOs	640 MBps	13.1 ms
DRP-Drupal	Information Technology - Operations	18,430 IOs	0 MBps	0.2 ms
AMX-Apache Maintenance	Information Technology - Operations	4,989 IOs	311 MBps	11.2 ms
TAB-Tableau	Business Intelligence	4,821 IOs	261 MBps	8.3 ms
RHS-Redhat Satellite	Information Technology - Operations	4,655 IOs	290 MBps	10.3 ms
QA	Information Systems - Development	4,029 IOs	57 MBps	5 ms
NET-Network Utility	Information Technology - Operations	1,990 IOs	0 MBps	0.4 ms
RHS-Redhat Satellite DR	Information Technology - Operations	1,935 IOs	121 MBps	8.7 ms
AIS-. Information Systems	Information Technology - Operations	1,567 IOs	4 MBps	0.2 ms

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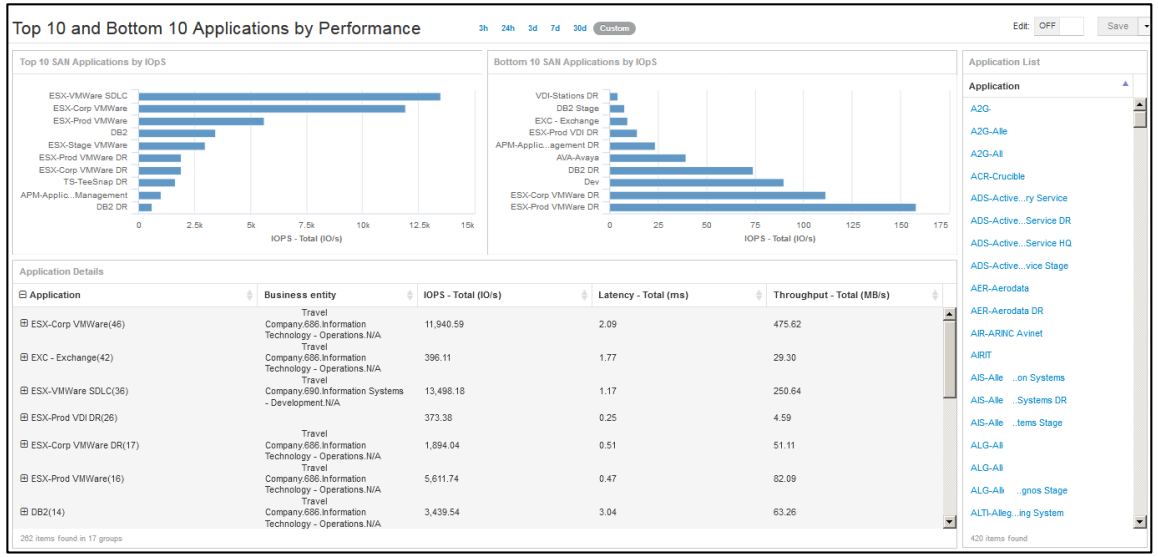
3.7 WebUI – Top 10 and Bottom 10 Applications by Performance

Description: This WebUI based dashboard shows Top 10 and Bottom 10 Applications over a user-selected time period. Standard performance metrics trends are Sum of Average IOpS, Latency, and Sum of Average Throughput. A list of Applications is available on the right with drill down capability.

Prerequisites: Requires access to the OCI WebUI. Annotations/definitions are necessary for Application, Business Entities like Tenant, Line of Business, Business Unit, or Project. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Application	OCI configured annotation. Defines the application with host or internal volume capacity.
Business Entity	OCI configured annotation. Business Entity can be any of the following: Tenant, Line of Business, Business Unit or Project.
Date	The date field applied to trending charts and selectable by the user.
IOpS – Total (IO/s)	Sum of Total Average IOpS (both read and write) averaged daily for the user selected time period.
Latency – Total (ms)	Total Average Latency in milliseconds (both read and write) averaged daily for the user selected time period.
Throughput – Total (MB/s)	Sum of Total Throughput in MB/second (both read and write) averaged daily for the user selected time period.

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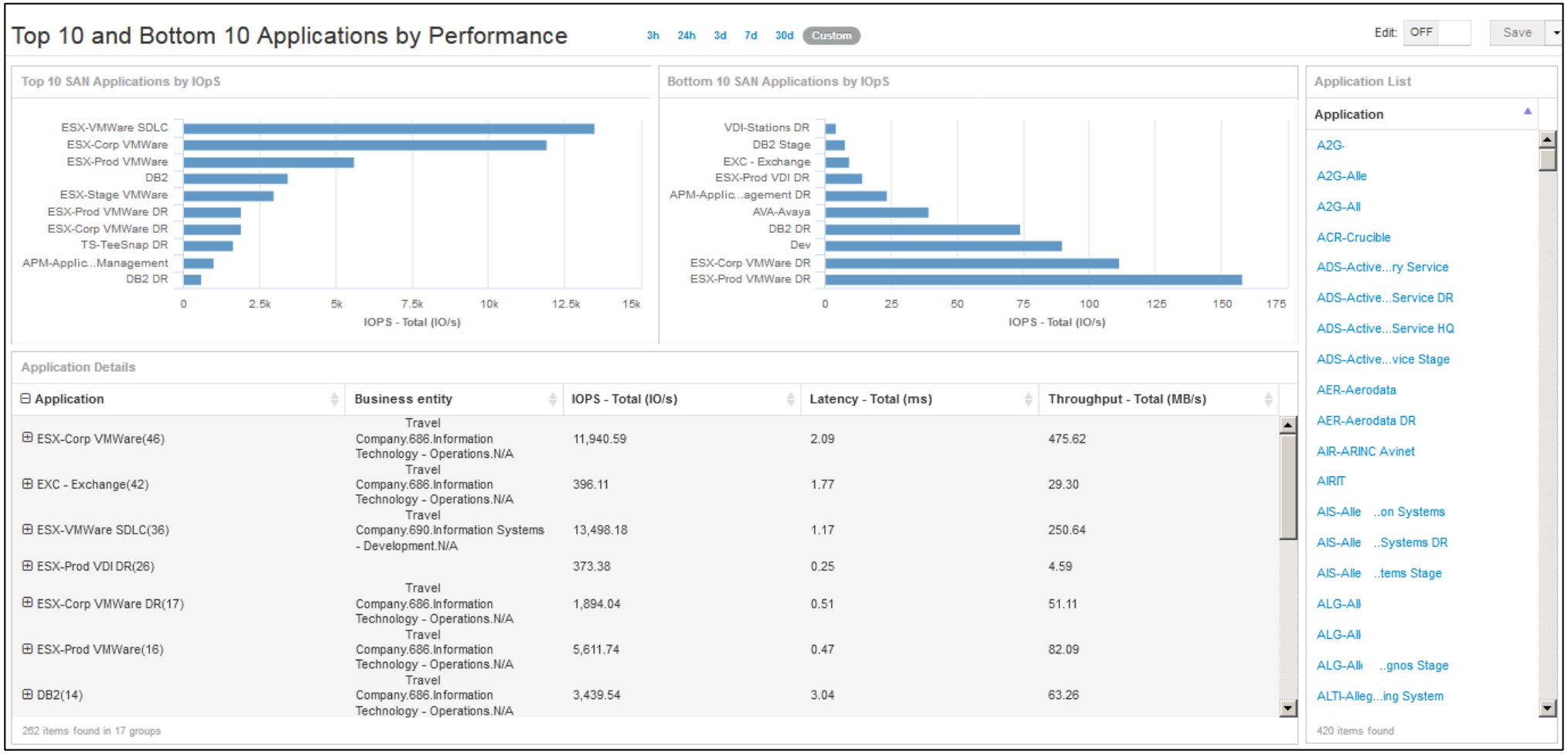

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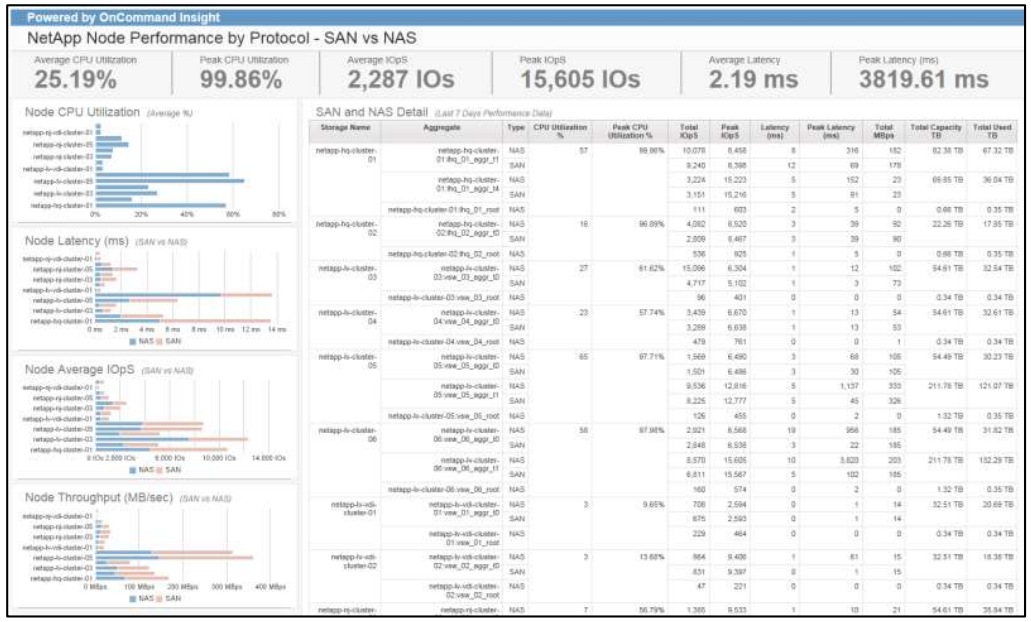
3.9 NetApp Node Performance by Protocol (SAN and NAS)

Description: This report lists NetApp Node Performance by Protocol – SAN vs NAS. On the top is a summary of global performance metrics. On the left are charts showing Node CPU Utilization percent (by array); Node Latency – SAN compared to NAS; Node Average IOpS – SAN compared to NAS; and Node Peak IOpS – SAN compared to NAS. The bottom section provides a list by Storage Name; Aggregate; Type (of Protocol); Node CPU Utilization percent; Total IOpS; Max Total IOpS; Latency; Max Latency; Total Capacity (of the Aggregate) and Total Used.

Prerequisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the storage array (or filer) discovered by OCI.
Aggregate	Name of the storage pool or aggregate associated with the storage array (or filer) discovered by OCI.
Type	Protocol used by the aggregate to deliver capacity. E.g. NAS or SAN
CPU Utilization %	CPU performance utilization as reported by the storage array (or filer).
Total IOpS	Total IOpS (both read and write) averaged daily for 7 days.
Max Total IOpS	Max Total IOpS (both read and write) daily for 7 days.
Latency (ms)	Total Response Time (latency) in milliseconds (both read and write) averaged daily for 7 days.
Max Latency (ms)	Max Response Time (latency) in milliseconds (both read and write) daily for 7 days.
Total Capacity GB	Capacity allocated for a storage-pool as reported by the storage-array in GB. Does not include capacity allocated for storage-pool level snapshots.
Total Used GB	Capacity used in a storage-pool as reported by the storage-array in GB. Does not include capacity used for storage-pool level snapshots.

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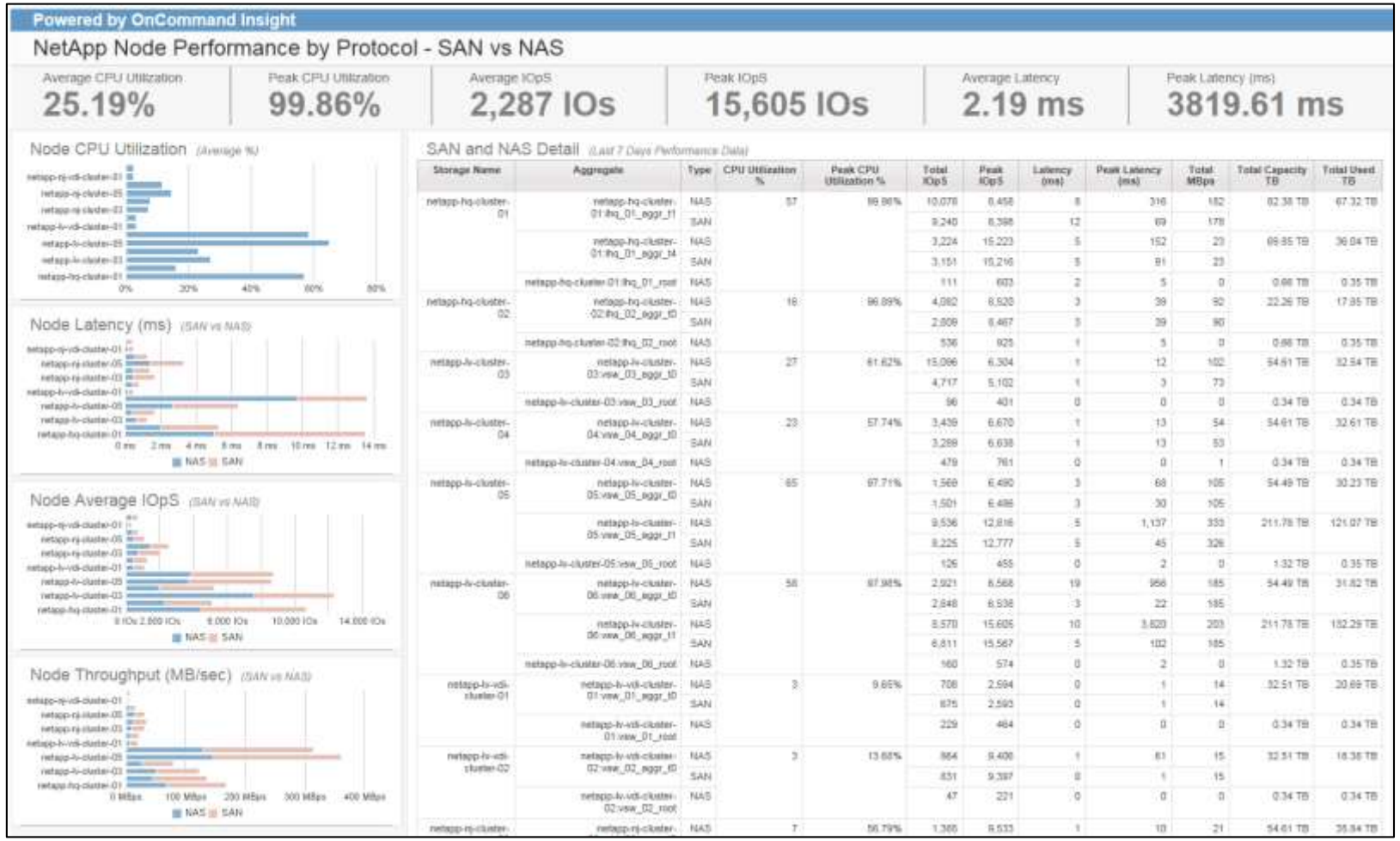
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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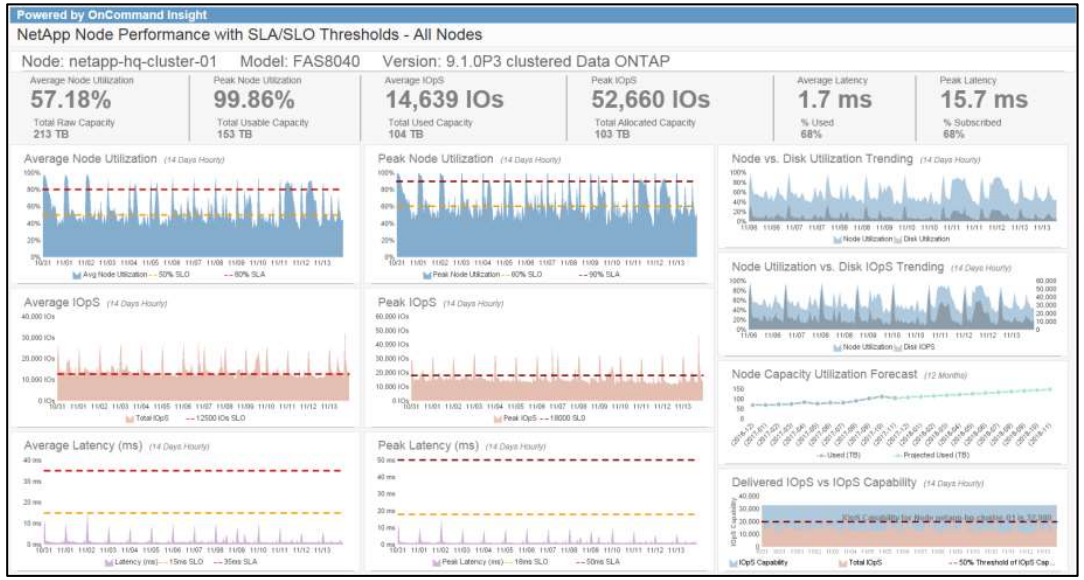
3.10 NetApp Node Performance with SLA-SLO Thresholds

Description: This report shows storage performance and capacity trending metrics by NetApp Node. A summary of performance metrics is displayed at top. SLA (Service Level Agreement) and SLO (Service Level Objective) default thresholds are based on defacto standards. IOpS Capability is derived from the disk manufacturer (e.g. SAS 15K disk has a capability of 200 IOpS).

Prerequisites: Perform, Plan and Discover Licenses. Application annotations are required. A valid cost model applied to Performance Service Levels are required. Requires secondary ETL script to run nightly.



Data Dictionary

☐ **Select This Report**

Field	Description
NetApp Node Name	Name of the NetApp Node associated with the NetApp Cluster monitored by OCI.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Average Node Utilization	Average CPU Utilization % collected hourly for a period of 14 days.
Peak Node Utilization	Peak CPU Utilization % collected hourly for a period of 14 days.
Average IOpS	Sum of Average Protocol IOpS (e.g. NFS, CIFS, FC, iSCSCI) as reported by the NetApp Node collected hourly for 14 days.
Peak IOpS	Sum of Peak Protocol IOpS collected hourly for a period of 14 days.
Average Latency	Average Latency in milliseconds collected hourly for a period of 14 days.
Peak Latency	Peak Latency in milliseconds collected hourly for a period of 14 days.
Disk Utilization	Average Disk Utilization % reported by the disks that support the aggregate, averaged hourly for 14 days.
Disk IOpS	Sum of Average Disk IOpS reported by the disks that support the aggregate, averaged hourly for 14 days.
Used (TB)	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned, then Used = Allocated.
Projected Used (TB)	Projected Used Capacity (TB) for future 12-month period. Based on standard linear regression formula embedded in the DWH ETL and contained in the Storage and Storage Pools Capacity Fact table.
IOpS Capability	IOpS Capability of the Storage Pool as published by the drive manufacturer. Example: a 15K SAS drive supports 200 IOpS.
Total IOpS	Same as Average IOpS.

 Click on the report screen shot above to view an enlarged image.

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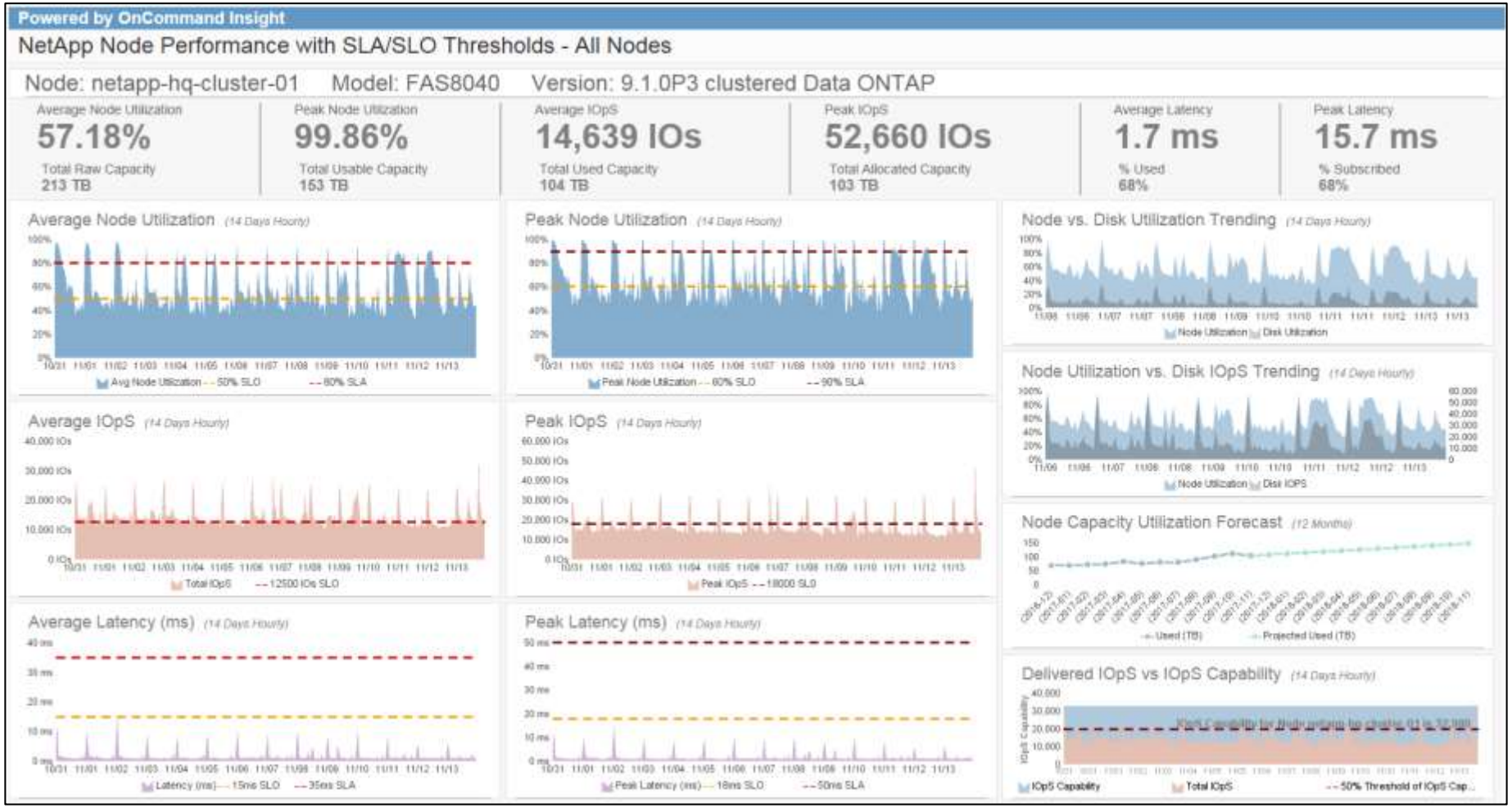
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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3.10 WebUI – Performance by Node

Description: This WebUI based dashboard shows NetApp Node Performance over a user selected time period. Standard performance metrics trends are Sum of Average IOpS, Peak IOpS, Disk IOpS, Node CPU Utilization and Disk Utilization. A list of Nodes is available on the right with drill down capability.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Node / Name	Name of the NetApp Node associated with the NetApp Cluster monitored by OCI.
Family	Name of the Family associated with the storage array monitored by OCI.
Model	Name of the Model associated with the storage array monitored by OCI.
Volume	Name of the Volume associated with the NetApp Node/Cluster monitored by OCI.
Date	The date field applied to trending charts and selectable by the user.
Volume Capacity Utilization	Capacity Utilization % as reported by the NetApp Internal Volumes associated with the Node monitored by OCI.
Capacity – Total (GB)	Total Usable Capacity as reported by the NetApp Internal Volumes.
Node Utilization	Average CPU Utilization % as reported by the NetApp Node for the user selected time period.
Disk Utilization	Average Disk Utilization % reported by the disks that support the aggregate for the user selected time period.
Volume IOpS	Average Volume IOpS for the user selected time period.
Disk IOpS	Disk IOpS for the user selected time period.
Peak IOpS	Peak Volume IOpS for the user selected time period.

 Click on the report screen shot above to view an enlarged image.

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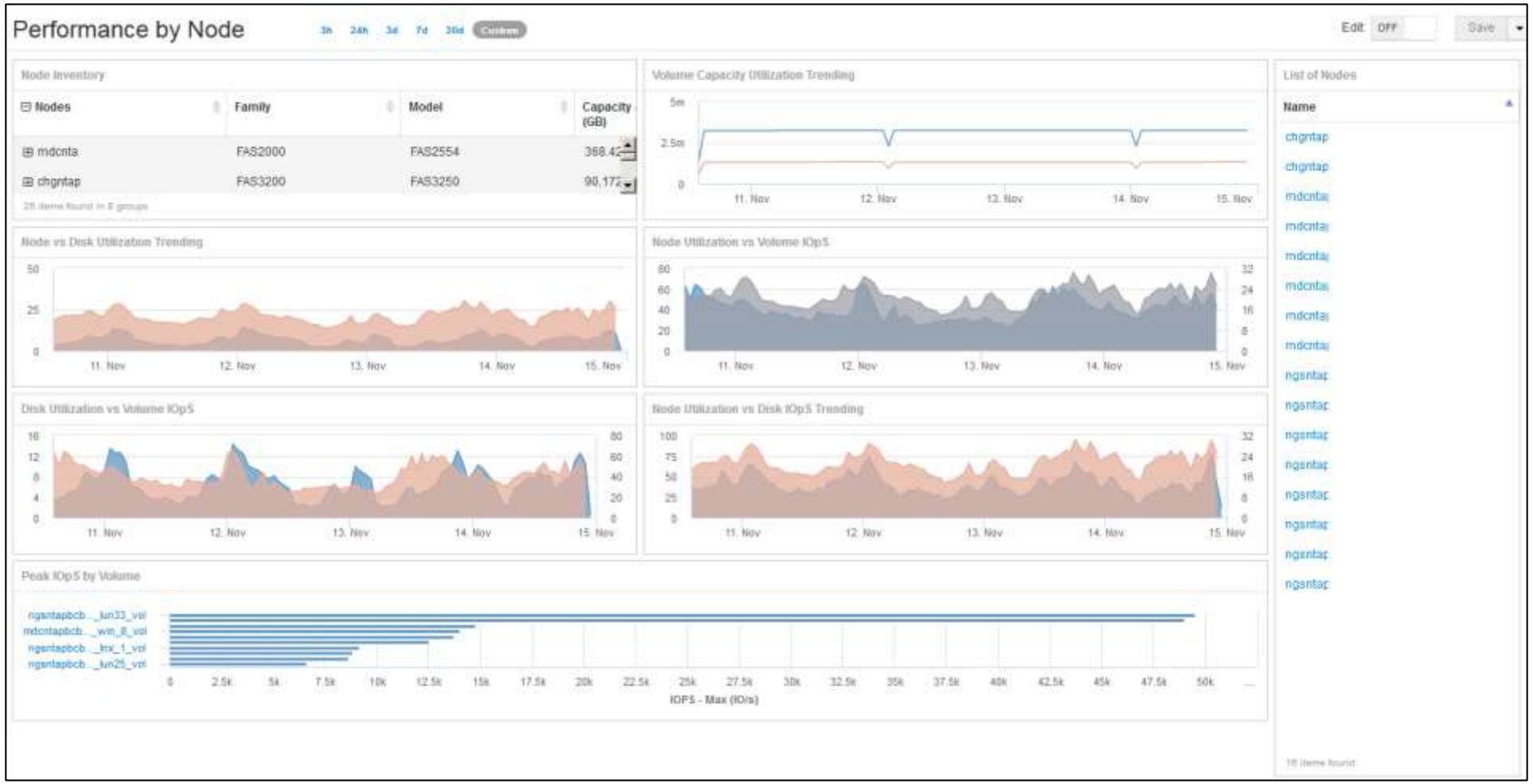
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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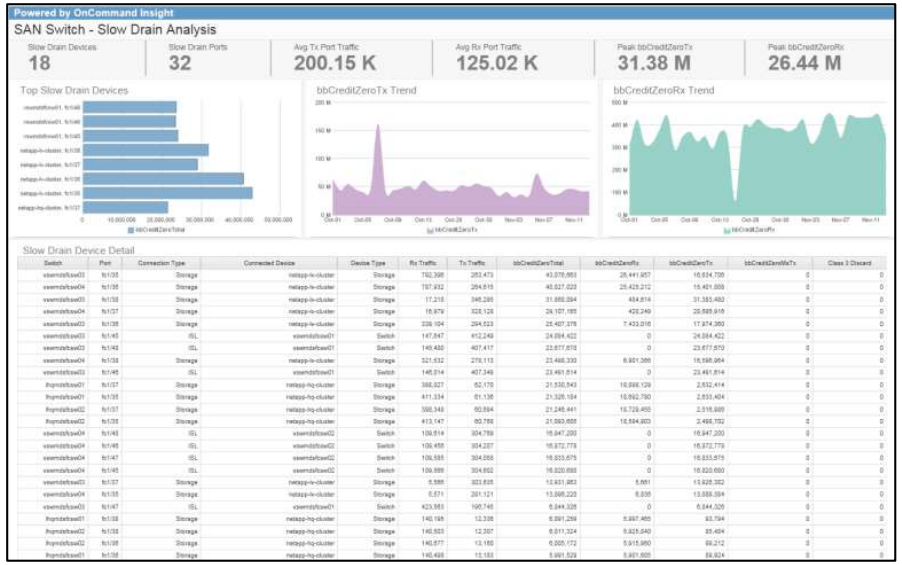
3.11 SAN Switch – Slow Drain Analysis

Description: This dashboard shows SAN switch slow drain status. Slow drain is derived from the bbCreditZero metric along with port latency or bbCreditZeroMsTx. For devices to qualify for slow drain, bbCreditZeroRx and Tx must be greater than 1,000,000 and bbCreditZeroMsTx must be >=1. A summary is displayed at the top of the page showing the number of devices that qualify for slow drain, the number of ports, traffic in MB and bbCreditZero values. There are three charts that show top slow drain devices and bbCreditZero trends. A detailed summary of connectivity is listed at bottom.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Switch	Name of the SAN switch monitored by OCI.
Port	Name of the switch port associated with the switch monitored by OCI.
Connection Type	Type of device the switch port is connected to…e.g. Host, Storage, ISL, Tape, or Generic Device (a device not resolved to an IP in OCI).
Connected Device	Name of the device (e.g. Host, Storage, etc.) that is connected to the switch port.
Device Type	Type of the device (e.g., Host, Storage, etc.) that is connected to the switch port.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Rx Traffic	Average traffic received in MB/sec collected hourly for 14 days.
Tx Traffic	Average traffic transmitted in MB/sec collected hourly for 14 days.
BB Credits	Buffer-to-Buffer credits (BBC) are a flow control method by Fibre Channel technology and represent the number of frames a port can store.
bbCreditZeroTotal	bbCreditZeroRx + bbCreditZeroTx
bbCreditZeroRx	Each time a port receives a frame that port's BB Credit is decremented by one; for each R_RDY received, that port's BB Credit is incremented by one. If the BB Credit is zero the corresponding node cannot transmit until an R_RDY is received back.
bbCreditZeroTx	Same as above only for transmitted frames.
bbCreditZeroMsTx	Port latency detected in milliseconds and used to support the reason for a slow drain condition.
Class 3 Discard	Class-3 is essentially a datagram service based on frame switching. They main advantage comes from not giving an acknowledgement that a frame has been rejected or busied by a destination device or Fabric.

 Click on the report screen shot above to view an enlarged image.

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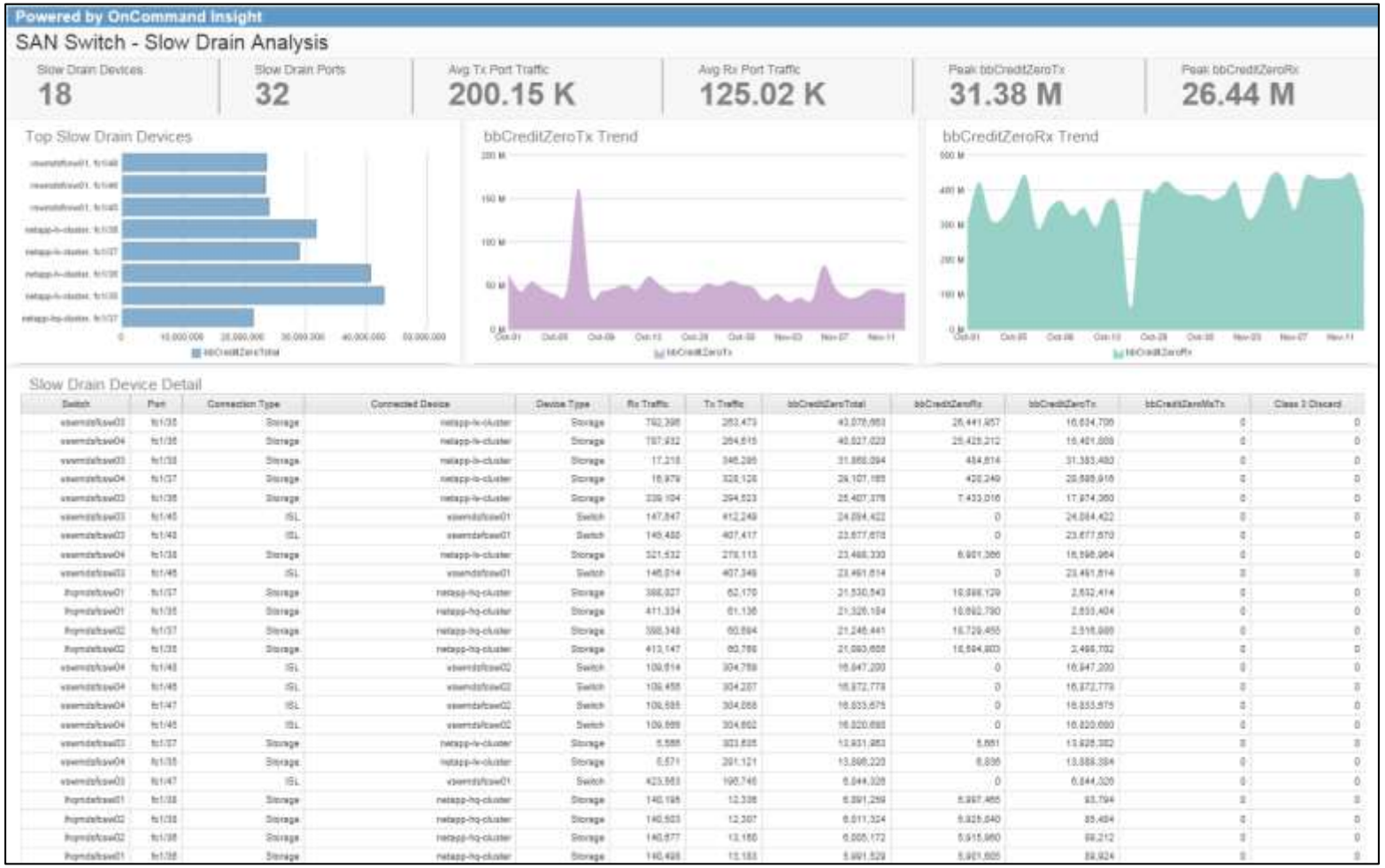
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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3.11 WebUI – Slow Drain Devices

Description: This WebUI based dashboard identifies potential slow drain devices over a user selected time period. Slow drain is derived from the bbCreditZero metric along with port latency or bbCreditZeroMsTx. For devices to qualify for slow drain, bbCreditZeroRx and Tx must be greater than 1,000,000 and bbCreditZeroMsTx must be >=1. On the far right, a selectable list of switches is available with drill down capability.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Switch Devices	Name of the SAN switch monitored by OCI.
Device	Same as Switch Devices.
Date	The date field applied to trending charts and selectable by the user.
BB Credit Zero – Total	Each time a port receives or transmits a frame that port's BB Credit is decremented by one; for each R_RDY received, that port's BB Credit is incremented by one. If the BB Credit is zero, the corresponding node cannot transmit until an R_RDY is received back.
Traffic – Total (MB/s)	Average traffic transmitted + received in MB/sec for the user selected time period.
Class 3 Discards	Class-3 is essentially a datagram service based on frame switching. They main advantage comes from not giving an acknowledgement that a frame has been rejected or busied by a destination device or Fabric.
Connected Device	Name of the device (e.g. Host, Storage, etc.) that is connected to the switch port.
Connected Device Type	Type of device the switch port is connected to…e.g. Host, Storage, ISL, Tape, or Generic Device (a device not resolved to an IP in OCI).
Violation Severity	Violation severity as configured in OCI (e.g. Warning, Critical).

 Click on the report screen shot above to view an enlarged image.

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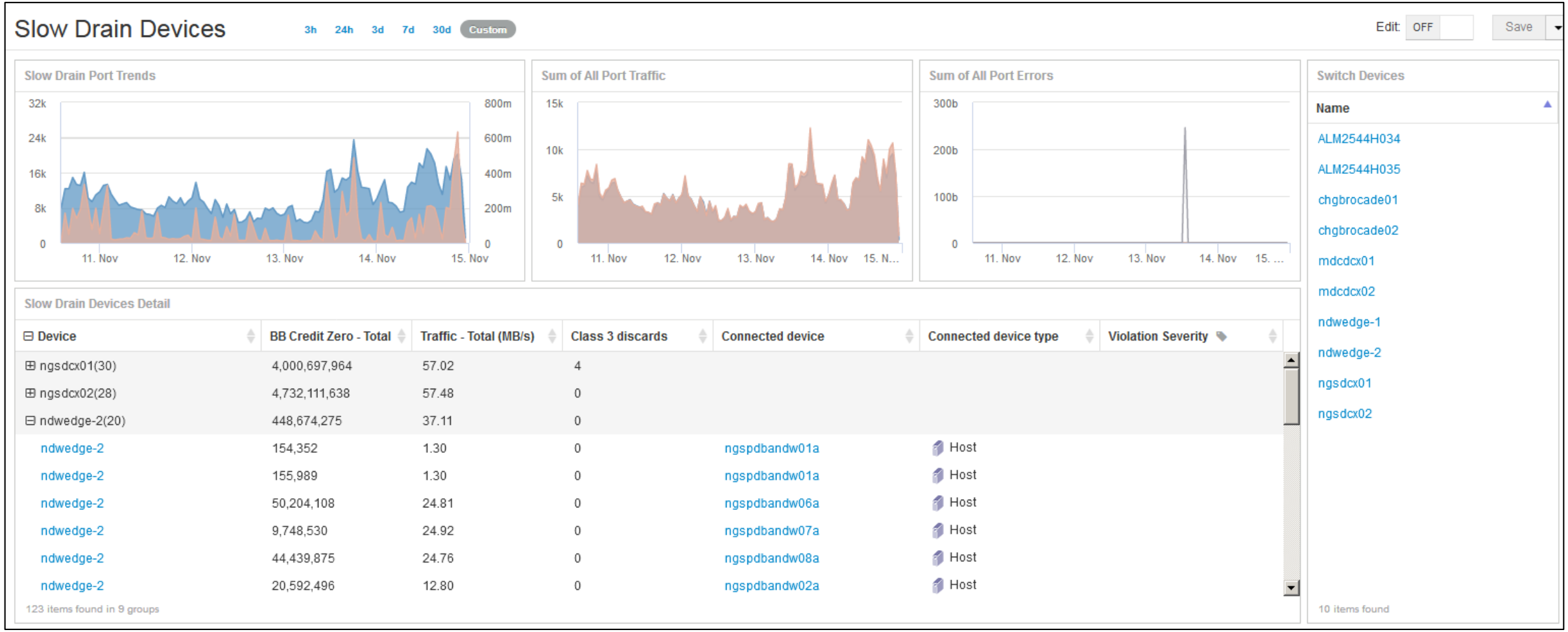

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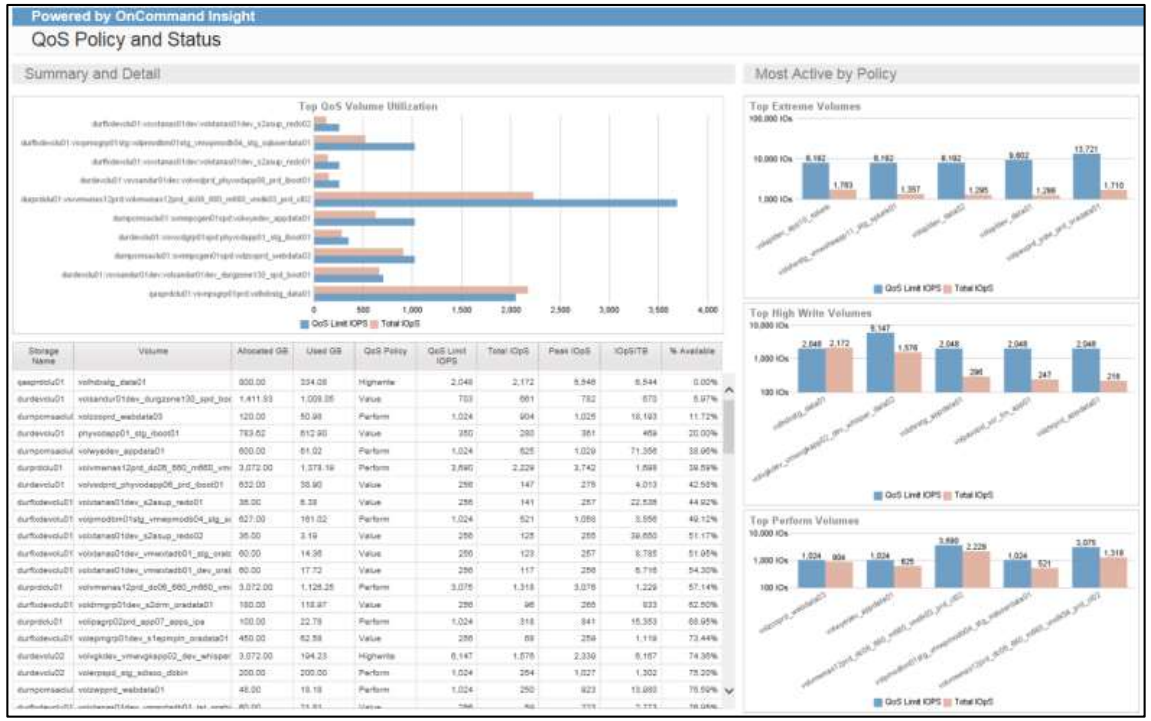
3.12 QoS Policy and Status

Description: This dashboard shows the status of QoS policies configured for NetApp Controllers.

Prerequisites: This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the NetApp Controller monitored by OCI.
Volume	Internal Volume or Flexvol associated with the NetApp Controller.
Allocated GB	Internal Volume Allocated Capacity in GB as contained in the Internal Volume Capacity Fact in the OCI DWH.
Used GB	Internal Volume Used Capacity in GB as reported by the Internal Volume Capacity Fact in the OCI DWH. If Space Guarantee is ENABLED then Used will equal Allocated.
QoS Policy	The QoS Policy configured for the workloads/flexvols within the NetApp Controller.
QoS Limit IOPS	The QoS IOpS Limit as configured as a part of the QoS Policy.
Total IOpS	Average Internal Volume IOpS collected hourly over a period of 14 days.
Peak IOpS	Peak Internal Volume IOpS collected hourly over a period of 14 days.
IOpS/TB	Also known as IO Density, this is the amount of IOpS delivered per TB of storage capacity.
% Available	TotalIOpS / QoS LimitI OPS

Click on the report screen shot above to view an enlarged image.

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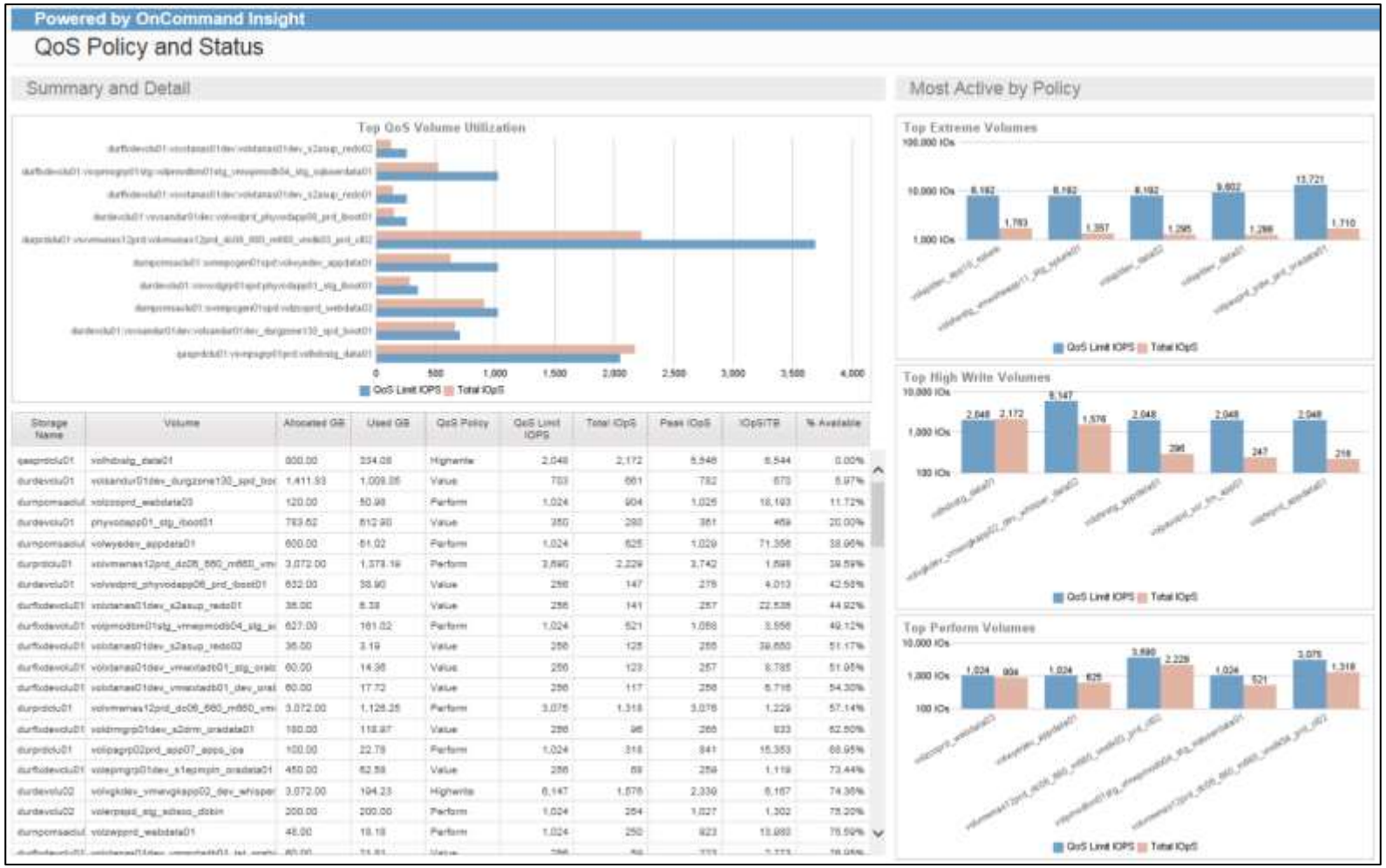
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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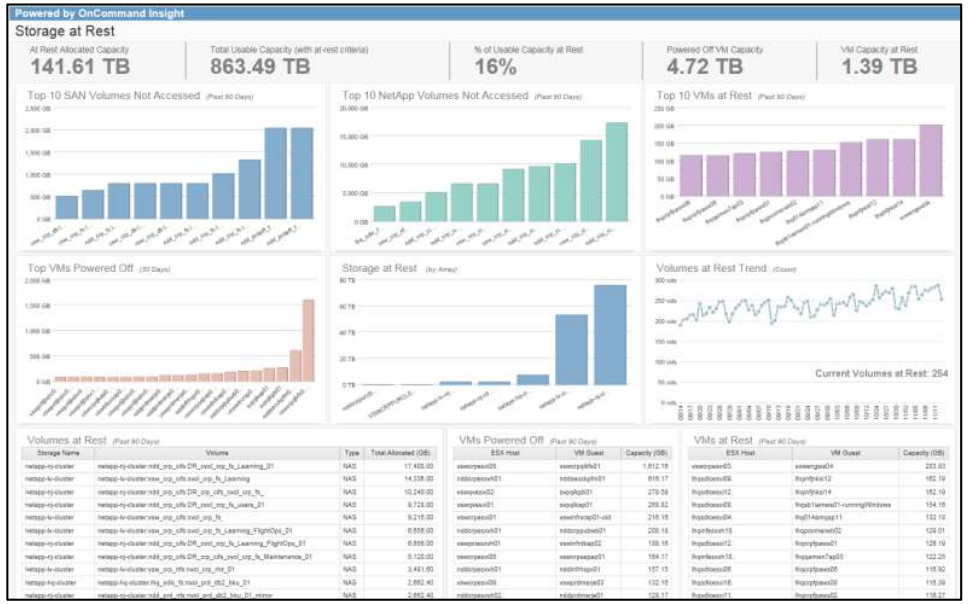
3.13 Storage at Rest

Description: This report shows SAN Volume, NetApp Volume, and VMs at rest. Top N VMs, VMs powered off, Storage Arrays at Rest Capacity and Top N SAN/NAS volumes at rest. 'At Rest' is defined as devices with 0 IOpS.

Prerequisites: Requires secondary ETL script to run nightly. There is a Non-ETL version as well. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the storage array monitored by OCI.
Volume	SAN Volume or Internal Volume (Flexvol) associated with the storage array monitored by OCI.
ESX Host	Name of the VMWare Hypervisor monitored by OCI.
VM Guest	Name of the VM Guest (Virtual Machine) associated with the VMWare Hypervisor monitored by OCI.
Date	Fulldate field derived from the Date Dimension table in the DWH.
At Rest Allocated Capacity TB	At Rest Allocated Capacity in TB as reported by each SAN Volume and/or Internal Volume (Flexvol) as contained the dwh_inventory.volume table or dwh_inventory.internal_volume table. This capacity metric is combined with associated performance tables where Total IOpS = 0 for a 90-day period.
Total Usable Capacity TB	Usable Capacity in TB as reported by the storage pool and contained in the dwh_inventory.storage_pool table. This capacity metric is combined with associated performance tables where Total IOpS = 0 for a 90-day period.
% of Usable Capacity at Rest	At Rest Allocated Capacity TB / Total Usable Capacity TB.
Powered Off VM Capacity	Count of virtual machines and sum of provisioned capacity that are powered-off.
VM Capacity at Rest	Sum of provisioned capacity that is combined with associated performance tables where Total IOpS = 0 for a 90-day period.
Type	SAN or NAS.
Total Allocated (GB)	Same as At Rest Allocated but in (GB).
Capacity (GB)	Provisioned Virtual Machine Capacity in GB.

Click on the report screen shot above to view an enlarged image.

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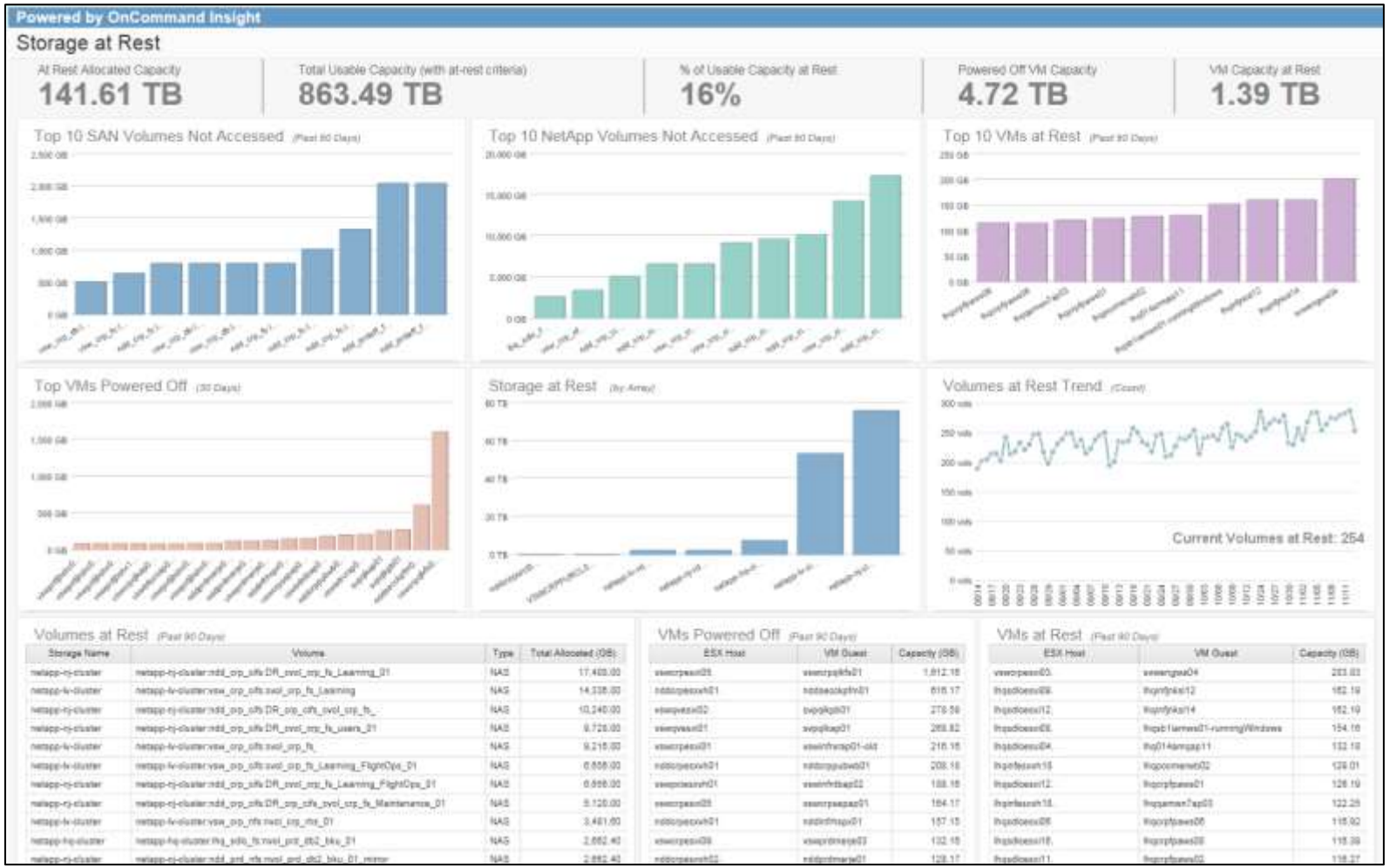
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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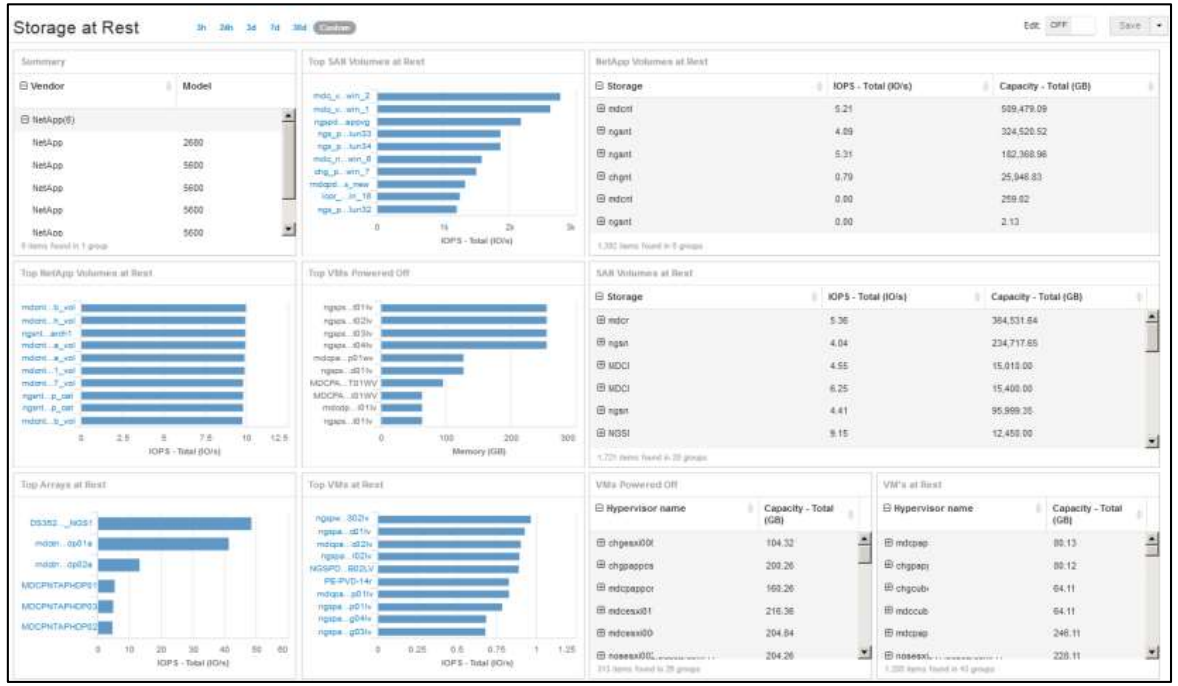
3.13 WebUI – Storage at Rest

Description: This WebUI based dashboard identifies volumes or virtual machines that have zero (0) IOpS for a period of x days. The user must specify the time period using custom. The recommended criteria for storage devices at rest is zero (0) IOpS for ninety (90) days.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage	Name of the storage array monitored by OCI.
Vendor	Name of the Manufacturer associated with the storage array monitored by OCI.
Model	Name of the Model associated with the storage array monitored by OCI.
NetApp Volumes	Internal Volume Name (Flexvol) associated with the NetApp Storage Device monitored by OCI
San Volumes	SAN Volume Name associated with the storage device monitored by OCI.
Hypervisor Name	Name of the ESX host/server/vCluster that contains the virtual machine environment.
VM Name	Name of the virtual machine associated with the ESX host.
Date	The date field applied to trending charts and selectable by the user.
Capacity – Total (GB)	Usable Capacity in (GB) as reported by the storage device monitored by OCI.
IOPS – Total (IO/s)	Average IOpS (both Read and Write) for the user selected time period.

Click on the report screen shot above to view an enlarged image.

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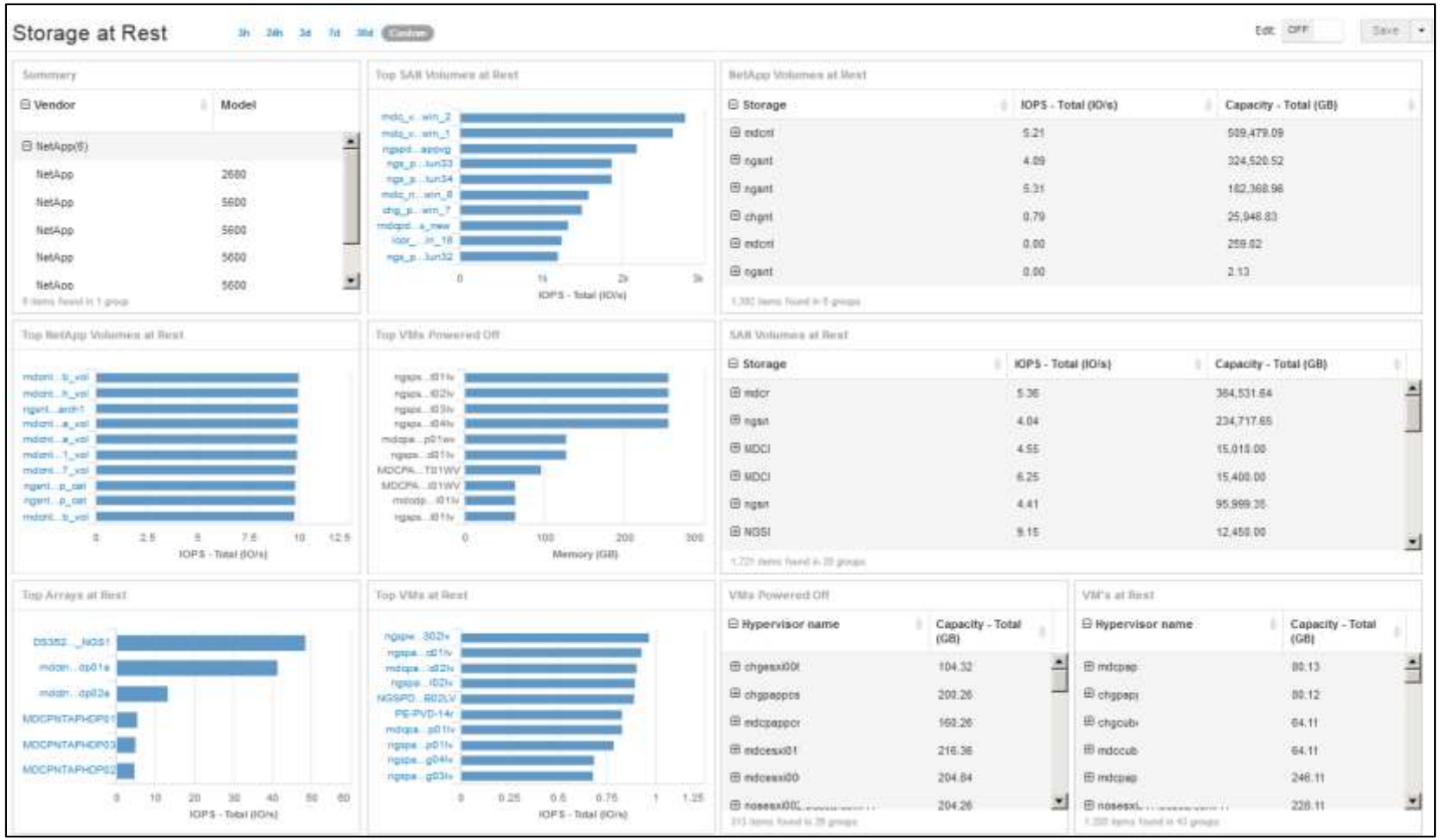
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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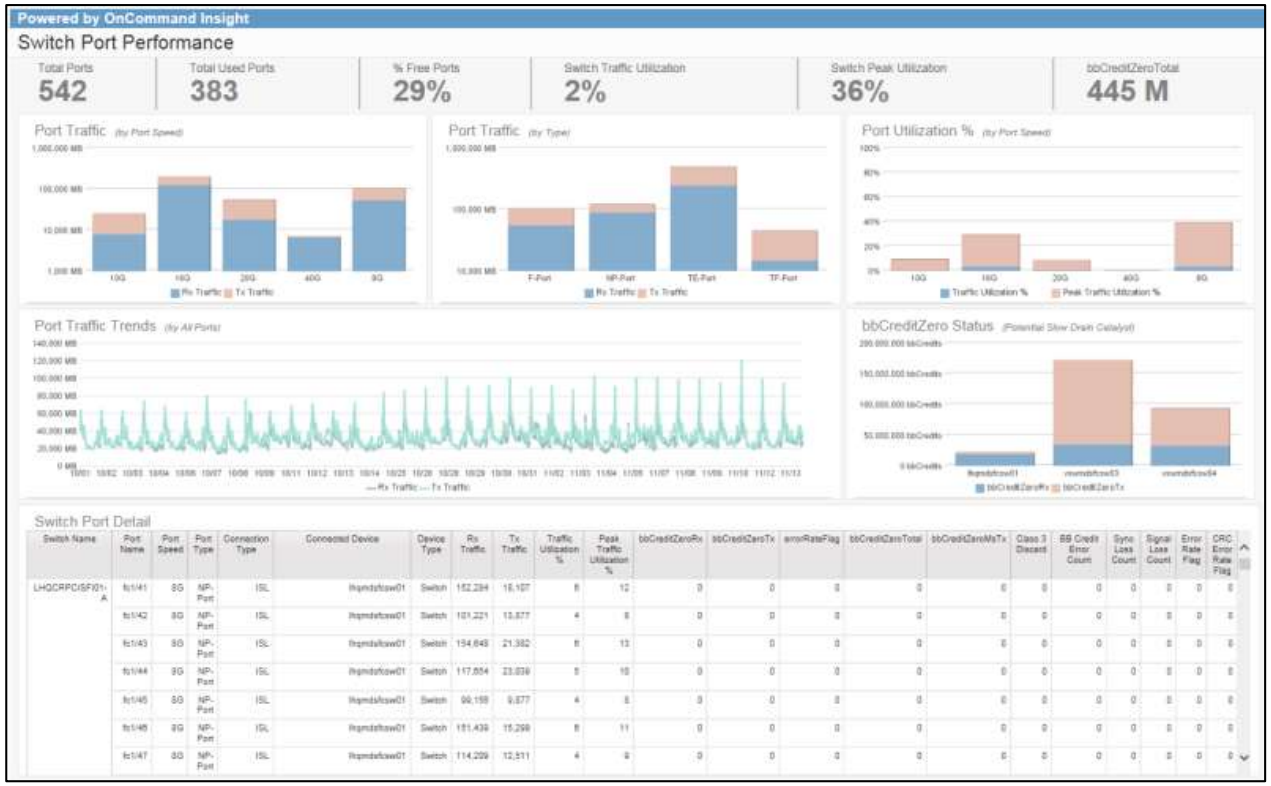
3.14 Switch Port Performance (Page 1 of 2)

Description: This dashboard shows SAN Switch Port Performance. A summary of port performance metrics are available at top. Port traffic charts by type and speed, port utilization %, port traffic trends and bbCreditZero values by switch are shown. Switch and port details are listed at bottom.

Prerequisites: This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

See next page

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3.14 Switch Port Performance (Page 2 of 2)

Field	Description
Switch Name	Name of the SAN switch monitored by OCI.
Port Name	Name of the port associated with the switch monitored by OCI.
Port Speed	Speed of the port in GB.
Port Type	Type of port (e.g. F-Port, E-Port, TF-Port etc.)
Connection Type	Connection Type (e.g. ISL, Host, Storage, etc.).
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Total Ports	Total number of ports reported by each switch monitored by OCI.
Total Used Ports	Total number of ports that are connected to devices and are active.
% Free Ports	Percentage of free ports. (e.g. ports that DO NOT have a connected device or that are not active).
Switch Traffic Utilization	Port traffic utilization %. Derived from Tx and Rx Traffic divided by the port speed.
Switch Peak Utilization	Peak port traffic utilization %.
Rx Traffic	Average traffic received in MB/sec collected hourly for 14 days.
Tx Traffic	Average traffic transmitted in MB/sec collected hourly for 14 days.
Traffic Utilization %	Same as Switch Traffic Utilization.
Peak Traffic Utilization %	Same as Switch Peak Traffic Utilization.
bbCreditZeroTotal	bbCreditZeroRx + bbCreditZeroTx Each time a port receives or transmits a frame that port's BB Credit is decremented by one; for each R_RDY received, that port's BB Credit is incremented by one. If the BB Credit is zero the corresponding node cannot transmit until an R_RDY is received back.

Data Dictionary

☐ **Select This Report**

Field	Description
bbCreditZeroRx	See above.
bbCreditZeroTx	See above.
errorRateFlag	The rate of errors as given by the Bit Error Rate (BER) over a period of time.
bbCreditZeroMsTx	Same as above only for transmitted frames.
Class 3 Discard	Port latency detected in milliseconds and used to support the reason for a slow drain condition.
BB Credit Error Count	Class-3 is essentially a datagram service based on frame switching. They main advantage comes from not giving an acknowledgement that a frame has been rejected or busied by a destination device or Fabric.
Sync Loss Count	Enumerated Loss of Signal Synchronization. It happens when the end to end signals are not synchronized.
Signal Loss Count	Enumerated loss of strength of a signal as it propagates over a fiber-channel medium.
CRC Error Rate Flag	The rate of CRC errors counted over a period of time. A cyclic redundancy check (CRC) is an error-detecting code commonly used in digital networks and storage devices to detect accidental changes to raw data. Blocks of data entering these systems get a short check value attached, based on the remainder of a polynomial division of their contents.

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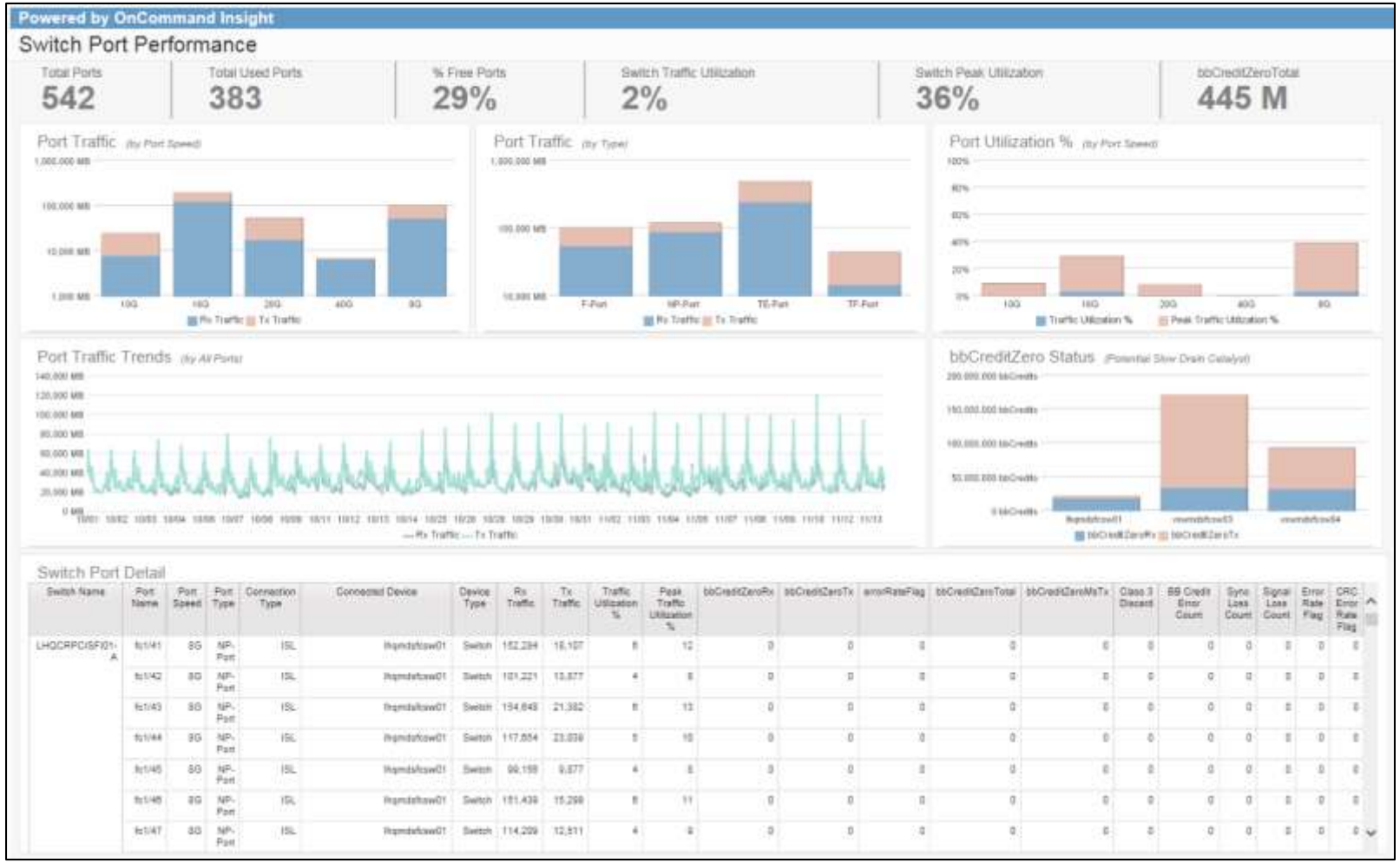
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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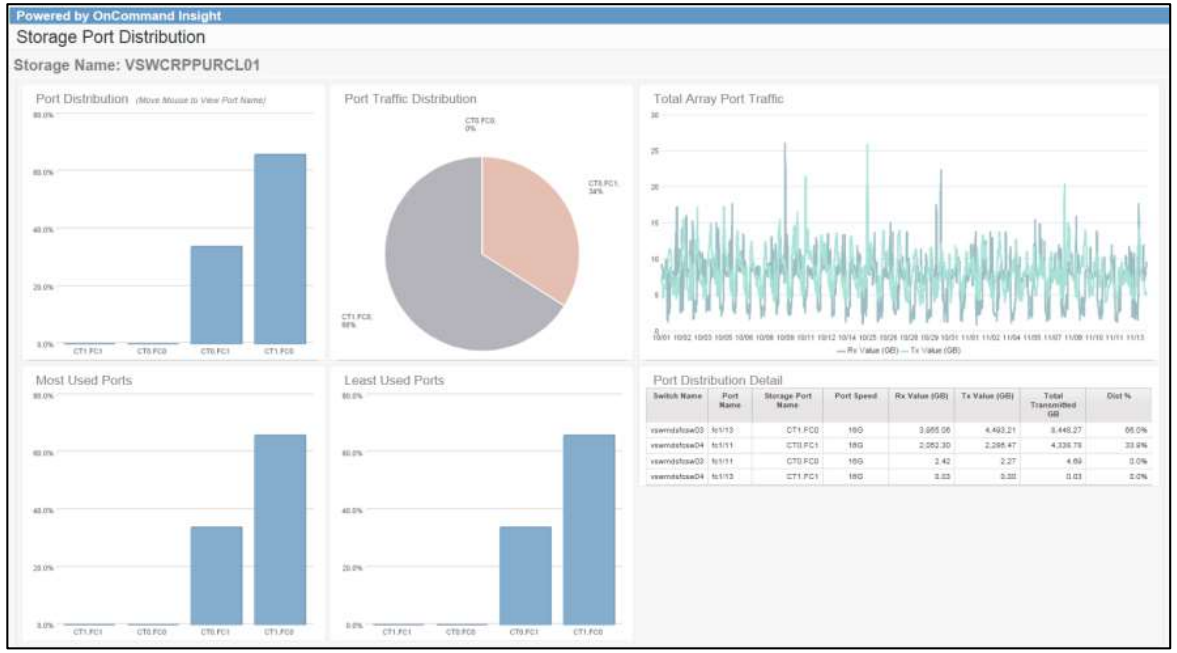
3.15 Storage Port Distribution

Description: This dashboard shows storage port distribution % by storage switch, storage port and port traffic in MB for a 7-day period. Top port allocation charts with distribution is presented. The report is segmented by array.

Pre-Requisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Device Name	Name of the storage array (or filer) discovered by OCI.
Switch Name	Name of the FC Switch discovered by OCI.
Port Name	Name of the FC port associated with the switch discovered by OCI.
Storage Port Name	Name of the FC port associated with the Storage Device discovered by OCI.
Port Speed	Speed of the port in GB/sec.
Rx Value (GB)	Port traffic received value in GB/sec.
Tx Value (GB)	Port traffic transmit value in GB/sec.
Total Transmitted GB	Rx Value (GB) + Tx Value (GB)
Total Transmitted for Storage	Formula = Total(Total Transmitted GB for Device Name) as an aggregated custom data item in Cognos.
Dist %	Formula = Total Transmitted GB / Total Transmitted for Storage.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.

Click on the report screen shot above to view an enlarged image.

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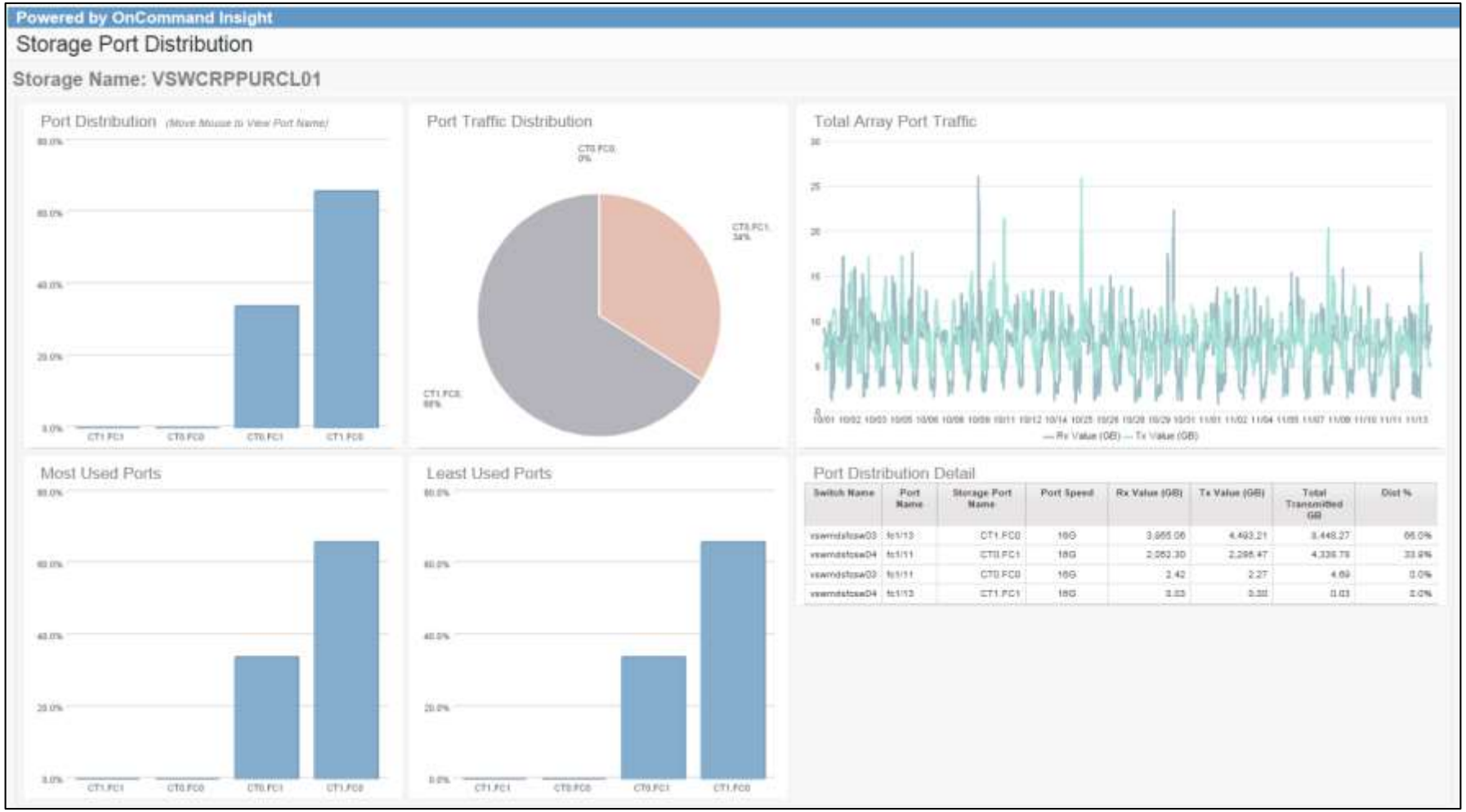
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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3.16 Performance by Array (Page 1 of 2)

Description: This dashboard shows the overall Performance of a selected storage array and its workload characteristics including Disk Utilization Trending and Disk IOpS Trending, Disk IOpS vs Disk IOpS Capability, Disk Utilization vs. Volume IOpS, Thick Volumes with Low Utilization, and Peak IOpS by Volume. A summary of performance metrics is available at the top of the page. A drop-down list of storage devices is available for interactive filtering by device.

Pre-Requisites: Annotations/definitions are necessary for Data Center and Service Level/Tier. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

See next page

Click on the report screen shot above to view an enlarged image.

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3.16 Performance by Array (Page 2 of 2)

Field	Description
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Tier	OCI configured annotation. Defines tiers of storage based on disk type, disk speed, storage array or pool, etc.
Array	Name of the storage array monitored by OCI.
Vendor	Name of the Manufacturer associated with the storage array monitored by OCI.
Family	Name of the Family associated with the storage array monitored by OCI.
Model	Name of the Model associated with the storage array monitored by OCI
Volume	Name of the volume or internal volume associated with the storage device monitored by OCI.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Allocated (TB)	Volume or Flexvol based capacity that is allocated to host initiators.

Data Dictionary

☐ **Select This Report**

Field	Description
Used (TB)	Total data files written in GB to the Internal Volume if NOT a LUN and Space Guarantee is DISABLED. For LUN's, Total Used will equal Total Allocated when NOT thin provisioned.
Average Disk Utilization	Average Disk Utilization % reported by the disks that support the storage pools or aggregates hourly for 14 days.
Disk Utilization	Same as Average Disk Utilization.
Disk IOpS	Sum of Average Disk IOpS reported by the disks that support storage pools or RAID Groups and collected hourly for 14 days.
Average Volume IOpS	Sum of Average Volume IOpS reported by the storage device and collected hourly for 14 days.
Volume IOpS	Same as Average Volume IOpS.
Average Volume Latency	Average Volume Latency in milliseconds reported by the storage device and collected hourly for 14 days.
Array IOpS Capability	IOpS Capability of the Storage Pool as published by the drive manufacturer. Example: a 15K SAS drive supports 200 IOpS.

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Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary

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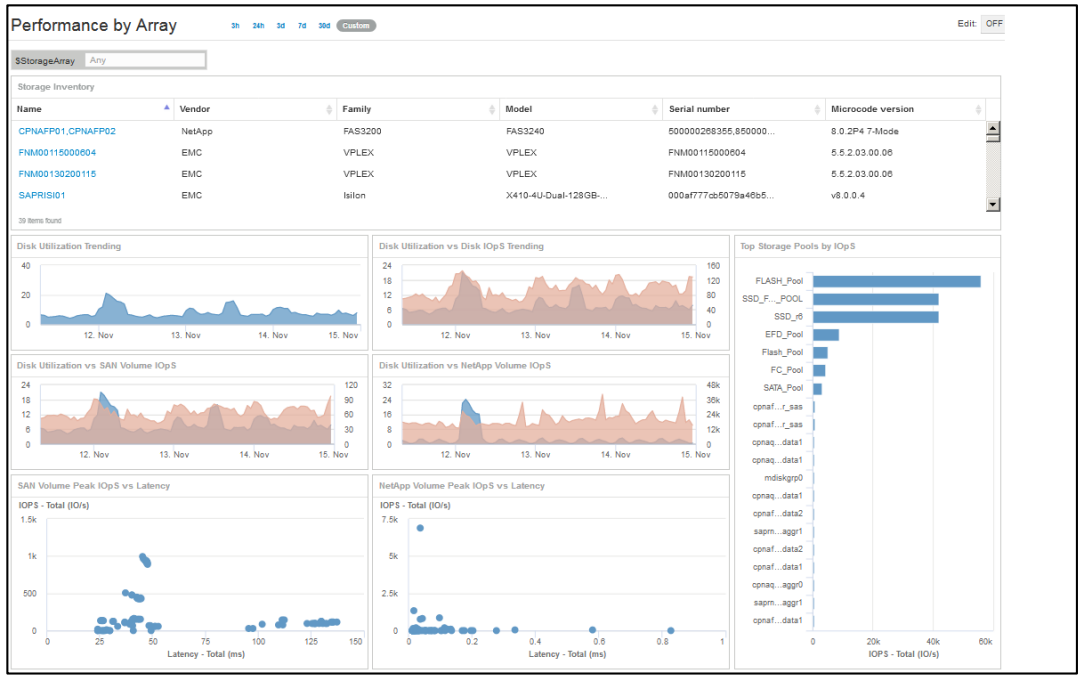
3.16 WebUI – Performance by Array

Description: This WebUI based dashboard shows global storage performance metrics. A search box is available to filter on specific storage arrays at the top of the page. Storage inventory is shown at top. Disk Utilization, Disk IOpS, Volume IOpS and Volume Latency are compared and contrasted.

Pre-Requisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Array	Name of the storage array monitored by OCI.
Vendor	Name of the Manufacturer associated with the storage array monitored by OCI.
Family	Name of the Family associated with the storage array monitored by OCI.
Model	Name of the Model associated with the storage array monitored by OCI.
Serial Number	Serial Number associated with the storage array monitored by OCI.
Microcode Version	Version of the Microcode or Firmware associated with the storage array monitored by OCI.
Date	The date field applied to trending charts and selectable by the user.
Disk Utilization	Average Disk Utilization % reported by the disks that support the storage pools or aggregates for the user selected time period.
Disk IOpS	Sum of Average Disk IOpS reported by the disks that support storage pools or RAID Groups for the user selected time period.
SAN Volume IOpS or IOpS – Total (IO/s)	Sum of Average SAN Volume IOpS reported by the storage device for the user selected time period.
NetApp Volume IOpS or IOpS – Total (IO/s)	Sum of Average NetApp Volume IOpS reported by the storage device for the user selected time period.
SAN Volume Latency	Average SAN Volume Latency in milliseconds reported by the storage device for the user selected time period.
NetApp Volume Latency	Average NetApp Volume Latency in milliseconds reported by the storage device for the user selected time period.

Click on the report screen shot above to view an enlarged image.

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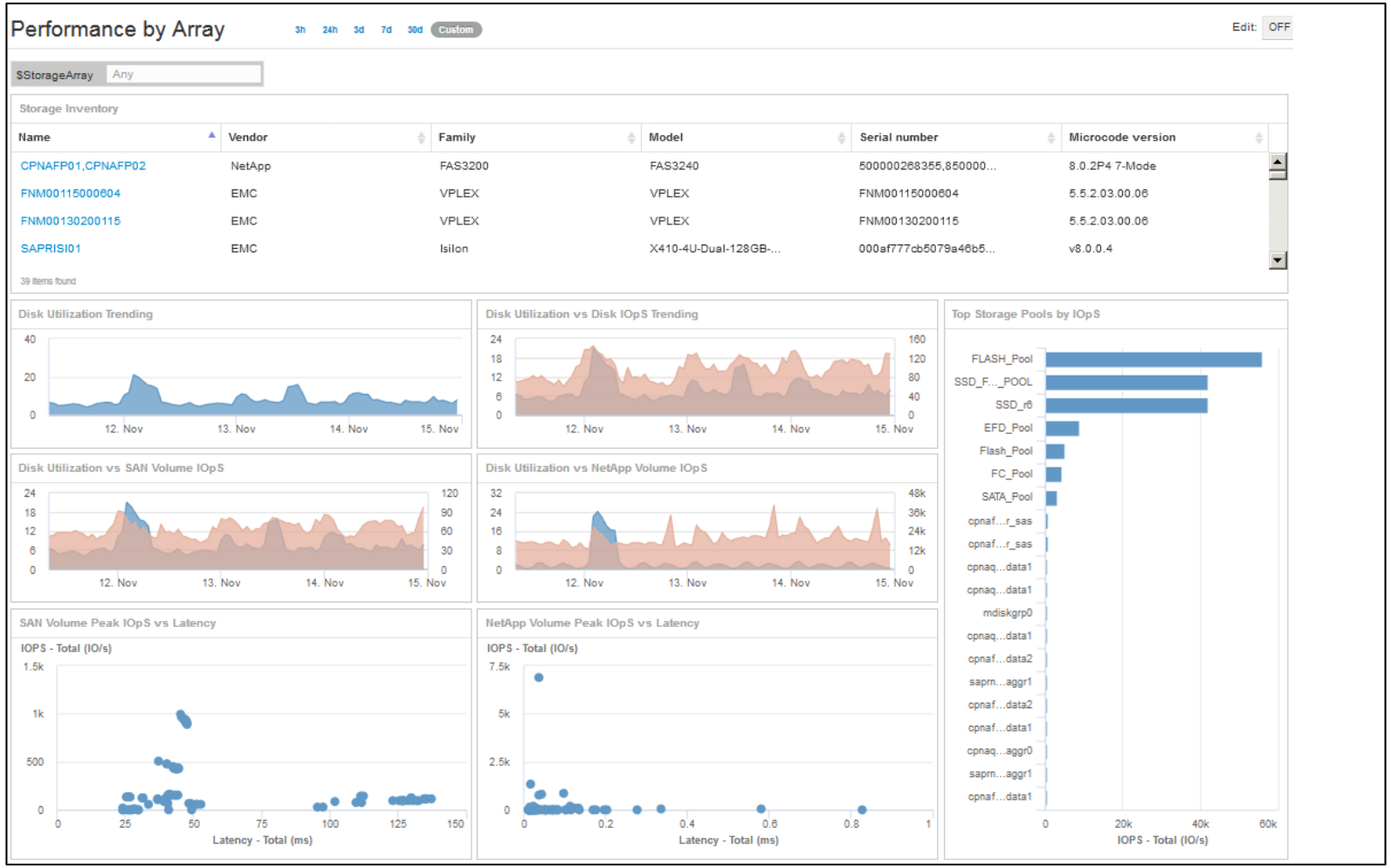
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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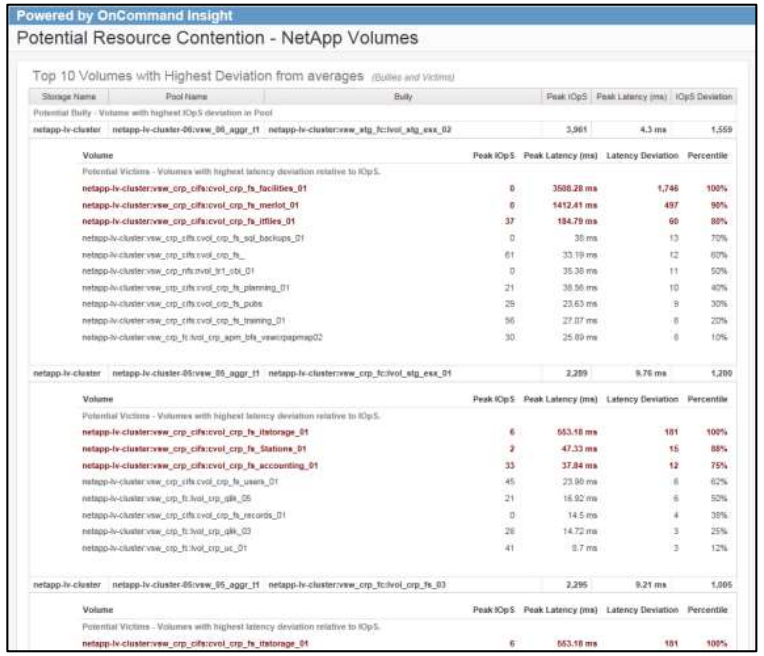
3.17 Potential Resource Contention – NetApp

Description: This report shows bullies and victim volume relationships by applying standard deviation statistical functions in order to highlight potential bullies, e.g. NetApp Internal Volumes (Flexvols) with the highest IOpS deviation, and victims, volumes with the lowest IOpS and highest Latency deviations.

Pre-Requisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the storage device monitored by OCI.
Pool Name	Name of the aggregate associated with the storage device monitored by OCI.
Bully (Volume Name)	The name of the internal volume (Flexvol) that is CAUSING the potential resource contention.
Victim (Volume Name)	The name of the internal volume (Flexvol) that is IMPACTED by the potential resource contention.
Peak IOpS	Peak IOpS (both Read and Write) collected hourly for the past 7 days.
Peak Latency	Peak Latency in milliseconds collected hourly for the past 7 days.
IOpS Deviation	Using the Cognos Standard Deviation function, shows the highest Peak IOpS value from the median average within the aggregate.
Host	Name of the host associated with the internal volume that has been identified as a potential victim.
Latency Deviation	Using the Cognos Standard Deviation function, shows the highest Peak Latency value from the median average within the aggregate.
Percentile	Using the Cognos Percentile function, shows the highest percentile of volumes that meet the standard deviation values.

Click on the report screen shot above to view an enlarged image.

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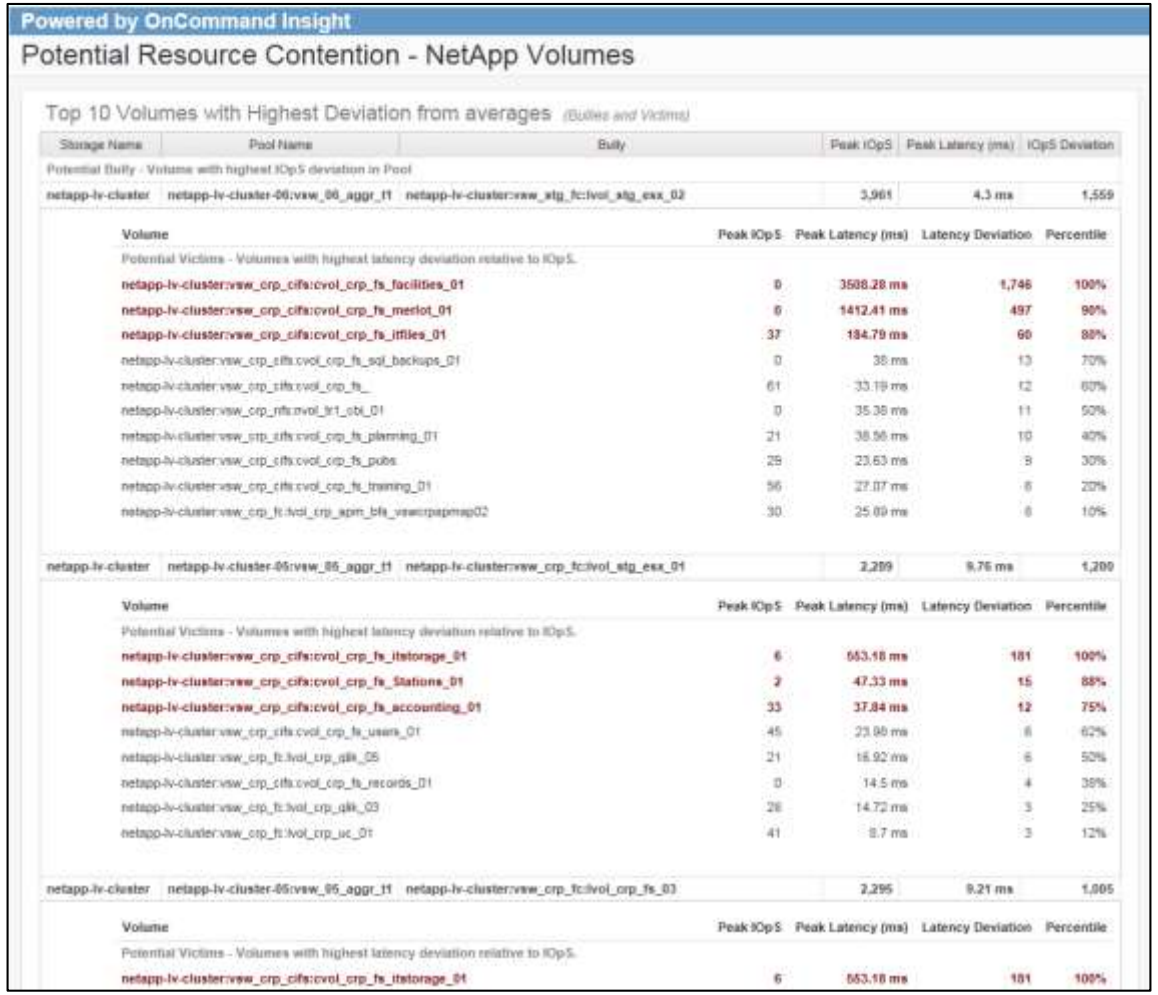
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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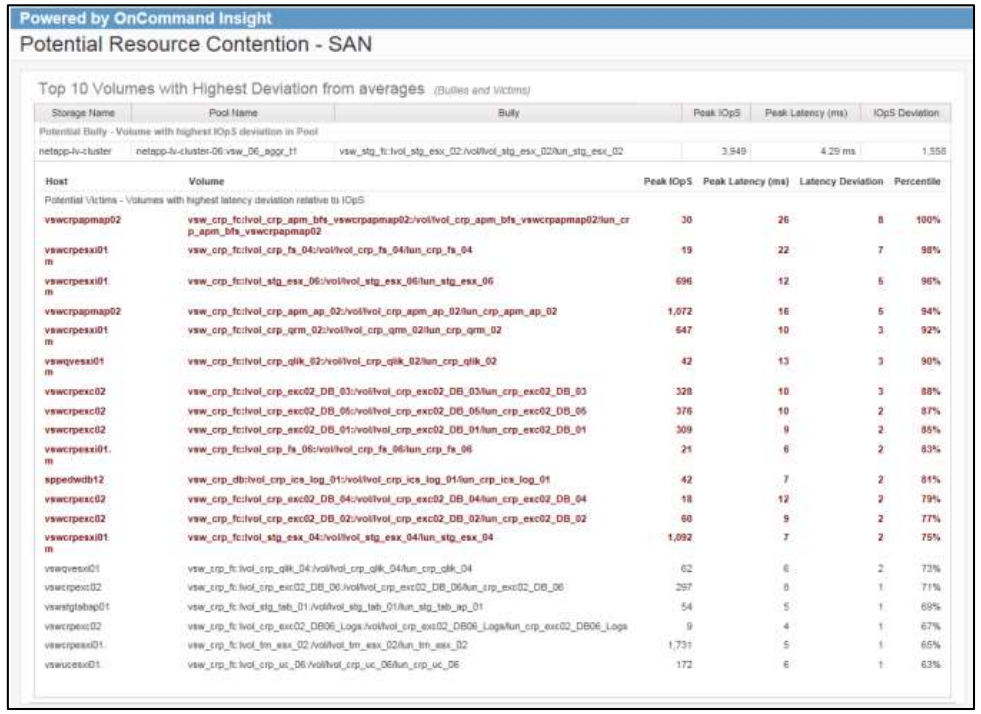
3.17 Potential Resource Contention – SAN

Description: This report shows bullies and victim volume relationships by applying standard deviation statistical functions in order to highlight potential bullies, e.g. SAN Volumes with the highest IOpS deviation, and victims, volumes with the lowest IOpS and highest Latency deviations.

Pre-Requisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the storage device monitored by OCI.
Pool Name	Name of the storage associated with the storage device monitored by OCI.
Bully (Volume Name)	The name of the volume that is CAUSING the potential resource contention.
Victim (Volume Name)	The name of the volume that is IMPACTED by the potential resource contention.
Peak IOpS	Peak IOpS (both Read and Write) collected hourly for the past 7 days.
Peak Latency	Peak Latency in milliseconds collected hourly for the past 7 days.
IOpS Deviation	Using the Cognos Standard Deviation function, shows the highest Peak IOpS value from the median average within the aggregate.
Host	Name of the host associated with the volume that has been identified as a potential victim.
Latency Deviation	Using the Cognos Standard Deviation function, shows the highest Peak Latency value from the median average within the aggregate.
Percentile	Using the Cognos Percentile function, shows the highest percentile of volumes that meet the standard deviation values.

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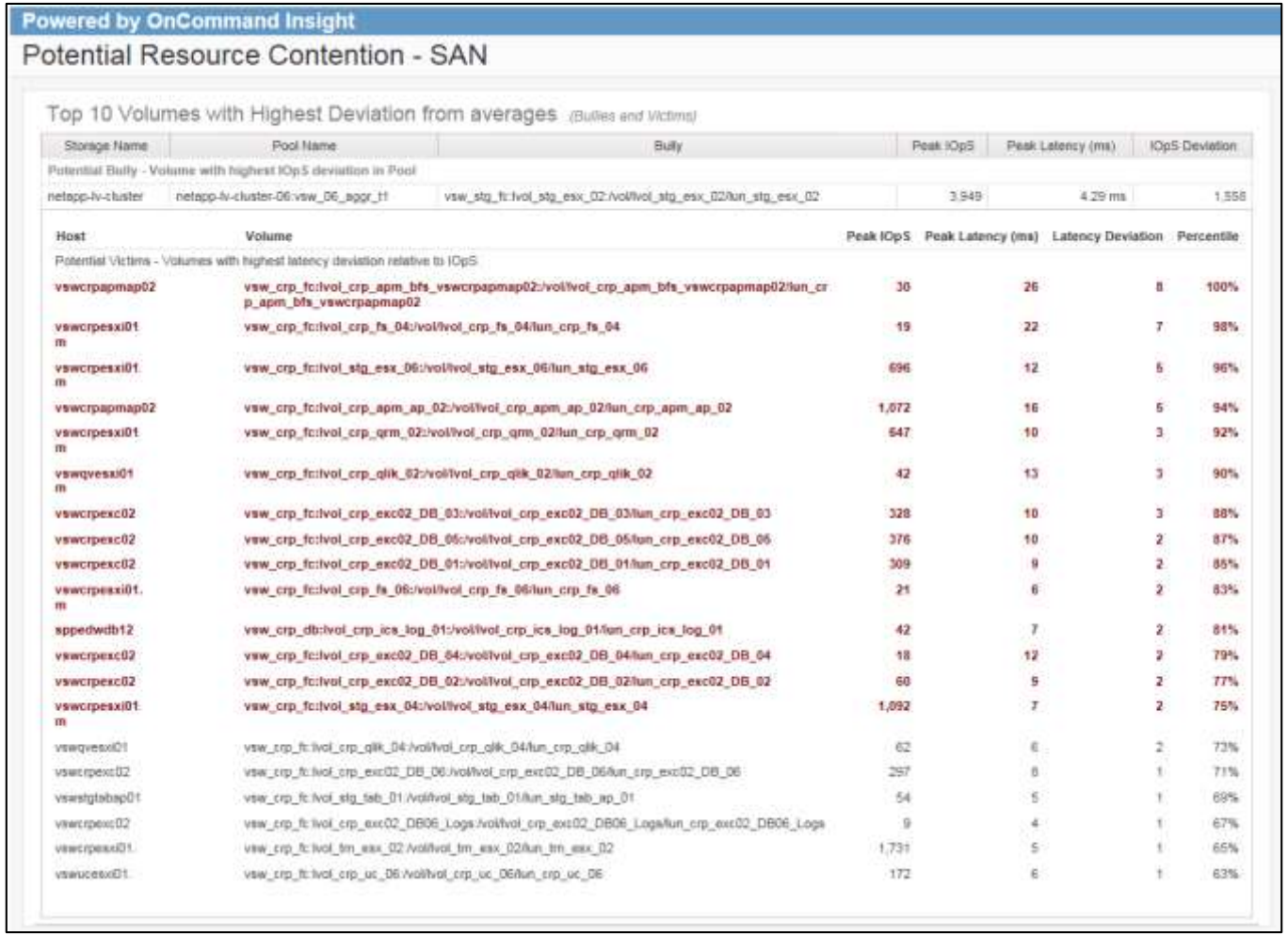
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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Potential Resource Contention - SAN

Top 10 Volumes with Highest Deviation from averages (Bullies and Victims)

Storage Name	Pool Name	Bully	Peak IOpS	Peak Latency (ms)	IOpS Deviation
Potential Bully - Volume with highest IOpS deviation in Pool					
netapp-lv-cluster	netapp-lv-cluster-06:vsw_06_aggr_1!	vsw_stg_fc:lvol_stg_esx_02:/vol/lvol_stg_esx_02/lun_stg_esx_02	3,949	4.29 ms	1,558

Host	Volume	Peak IOpS	Peak Latency (ms)	Latency Deviation	Percentile
Potential Victims - Volumes with highest latency deviation relative to IOpS					
vswcrpapmap02	vsw_crp_fc:lvol_crp_apm_bfs_vswcrpapmap02:/vol/lvol_crp_apm_bfs_vswcrpapmap02/lun_crp_apm_bfs_vswcrpapmap02	30	26	8	100%
vswcrpesxi01m	vsw_crp_fc:lvol_crp_fs_04:/vol/lvol_crp_fs_04/lun_crp_fs_04	19	22	7	98%
vswcrpesxi01m	vsw_crp_fc:lvol_stg_esx_06:/vol/lvol_stg_esx_06/lun_stg_esx_06	696	12	5	96%
vswcrpapmap02	vsw_crp_fc:lvol_crp_apm_ap_02:/vol/lvol_crp_apm_ap_02/lun_crp_apm_ap_02	1,072	16	5	94%
vswcrpesxi01m	vsw_crp_fc:lvol_crp_qrm_02:/vol/lvol_crp_qrm_02/lun_crp_qrm_02	647	10	3	92%
vswqvesxi01m	vsw_crp_fc:lvol_crp_qlik_02:/vol/lvol_crp_qlik_02/lun_crp_qlik_02	42	13	3	90%
vswcrpexc02	vsw_crp_fc:lvol_crp_exc02_DB_03:/vol/lvol_crp_exc02_DB_03/lun_crp_exc02_DB_03	328	10	3	88%
vswcrpexc02	vsw_crp_fc:lvol_crp_exc02_DB_05:/vol/lvol_crp_exc02_DB_05/lun_crp_exc02_DB_05	376	10	2	87%
vswcrpexc02	vsw_crp_fc:lvol_crp_exc02_DB_01:/vol/lvol_crp_exc02_DB_01/lun_crp_exc02_DB_01	309	9	2	85%
vswcrpesxi01.m	vsw_crp_fc:lvol_crp_fs_06:/vol/lvol_crp_fs_06/lun_crp_fs_06	21	6	2	83%
sppedwdb12	vsw_crp_db:lvol_crp_ics_log_01:/vol/lvol_crp_ics_log_01/lun_crp_ics_log_01	42	7	2	81%
vswcrpexc02	vsw_crp_fc:lvol_crp_exc02_DB_04:/vol/lvol_crp_exc02_DB_04/lun_crp_exc02_DB_04	18	12	2	79%
vswcrpexc02	vsw_crp_fc:lvol_crp_exc02_DB_02:/vol/lvol_crp_exc02_DB_02/lun_crp_exc02_DB_02	60	5	2	77%
vswcrpesxi01m	vsw_crp_fc:lvol_stg_esx_04:/vol/lvol_stg_esx_04/lun_stg_esx_04	1,092	7	2	75%
vswqvesxi01	vsw_crp_fc:lvol_crp_qlik_04:/vol/lvol_crp_qlik_04/lun_crp_qlik_04	62	6	2	73%
vswcrpexc02	vsw_crp_fc:lvol_crp_exc02_DB_06:/vol/lvol_crp_exc02_DB_06/lun_crp_exc02_DB_06	257	6	1	71%
vswstgtabap01	vsw_crp_fc:lvol_stg_tab_01:/vol/lvol_stg_tab_01/lun_stg_tab_ap_01	54	5	1	69%
vswcrpexc02	vsw_crp_fc:lvol_crp_exc02_DB06_Logs:/vol/lvol_crp_exc02_DB06_Logs/lun_crp_exc02_DB06_Logs	9	4	1	67%
vswcrpesxi01	vsw_crp_fc:lvol_tm_esx_02:/vol/lvol_tm_esx_02/lun_tm_esx_02	1,731	5	1	65%
vswucesxi01	vsw_crp_fc:lvol_crp_uc_06:/vol/lvol_crp_uc_06/lun_crp_uc_06	172	6	1	63%

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3.18 Exchange Dashboard

Description: This report uses OCI configured Application annotations to Identify workloads associated with Exchange Servers. A summary of capacity and performance is visible at the top of the page. 14-day hourly performance charts show Average and Peak IOpS, Latency and Throughput values. Exchange storage inventory, storage capacity utilization and bottom to top charts showing Sum of Average IOpS and Average Latency.

Pre-Requisites: Annotations/definitions are necessary for Applications. Requires secondary ETL script to run nightly. There is a Non-ETL version as well. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Application / Workload	OCI configured annotation. Defines the application with Exchange host or internal volume capacity.
Storage Name	Name of the storage device associated with the Exchange Application and monitored by OCI.
Pool Name	Name of the storage pool or aggregate associated with the storage device monitored by OCI.
Volume	Name of the Volume or Internal Volume (Flexvol) associated with the Exchange Application.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Allocated Capacity TB	Volume or Internal Volume Allocated capacity to host initiators.
Used Capacity TB	Total data files written in GB to the Internal Volume if NOT a LUN and Space Guarantee is DISABLED. For LUN's, Total Used will equal Total Allocated when NOT thin provisioned.
Average MBps	Sum of Average Throughput in MB/sec collected hourly for a period of 14 days.
Average IOpS	Sum of Average IOpS collected hourly for a period of 14 days.
Average Latency	Average Latency in milliseconds collected hourly for a period of 14 days.
Peak Throughput	Peak Throughput in MB/sec collected hourly for a period of 14 days.
Peak IOpS	Peak IOpS collected hourly for a period of 14 days.
Peak Latency	Peak Latency in milliseconds collected hourly for a period of 14 days.

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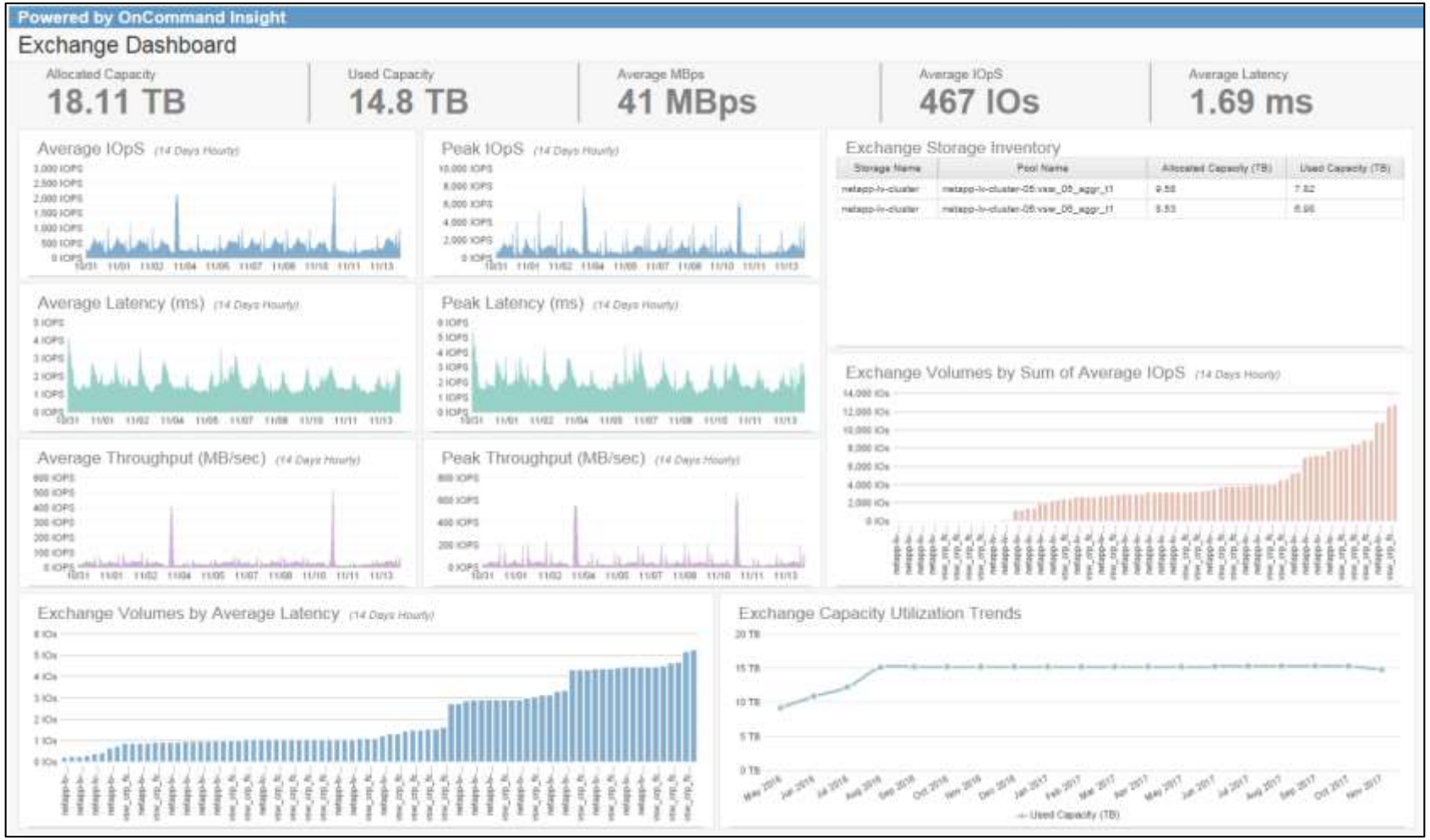
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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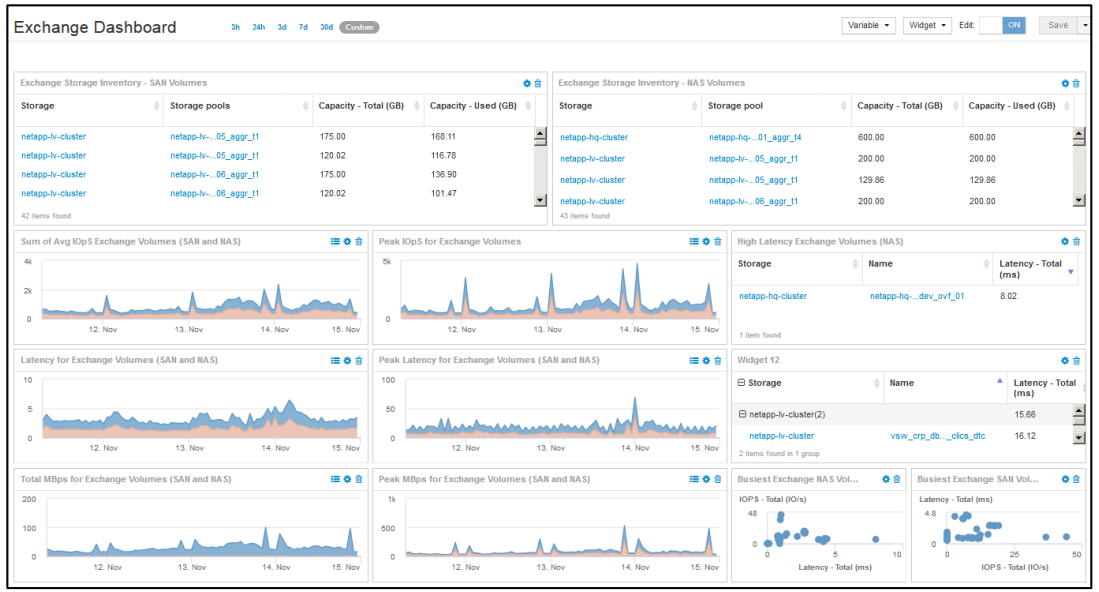
3.18 WebUI – Exchange Dashboard

Description: This WebUI based dashboard shows OCI configured Application annotations to Identify workloads associated with Exchange Servers. Exchange storage inventory is shown for SAN and NAS at the top of the page. Performance charts for IOpS, Throughput and Latency are available, and the date range is user selectable. High Latency NAS and SAN volumes are isolated at right and the busiest Exchange volumes for both SAN and NAS are at bottom right.

Pre-Requisites: Requires access to the OCI WebUI. Annotations/definitions are necessary for Applications. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage	Name of the storage device monitored by OCI.
Storage Pools	Name of the storage pool or aggregate associated with the storage device monitored by OCI.
Volumes (NAS)	Name of the NetApp Internal Volume associated with the NetApp storage device.
Volumes (SAN)	Name of the Volume associated with the storage device.
Date	The date field applied to trending charts and selectable by the user.
Sum of Average IOpS or IOpS – Total (IO/s)	Sum of Average IOpS reported by the storage device for the user selected time period.
Sum of MBps or Throughput	Sum of Average Throughput in MB/sec reported by the storage device for the user selected time period.
Average Latency or Latency – Total (ms)	Average Latency in milliseconds reported by the storage device for the user selected time period.
Peak IOpS	Peak IOpS reported by the storage device for the user selected time period.
Peak MBps	Peak Throughput in MB/sec reported by the storage device for the user selected time period.
Peak Latency	Peak Latency in milliseconds reported by the storage device for the user selected time period.
Capacity – Total (GB)	Volume or Internal volume capacity allocated to host initiators.
Capacity – Used (GB)	Total data files written in GB to the Internal Volume if NOT a LUN and Space Guarantee is DISABLED. For LUN's, Total Used will equal Total Allocated when NOT thin provisioned.

Click on the report screen shot above to view an enlarged image.

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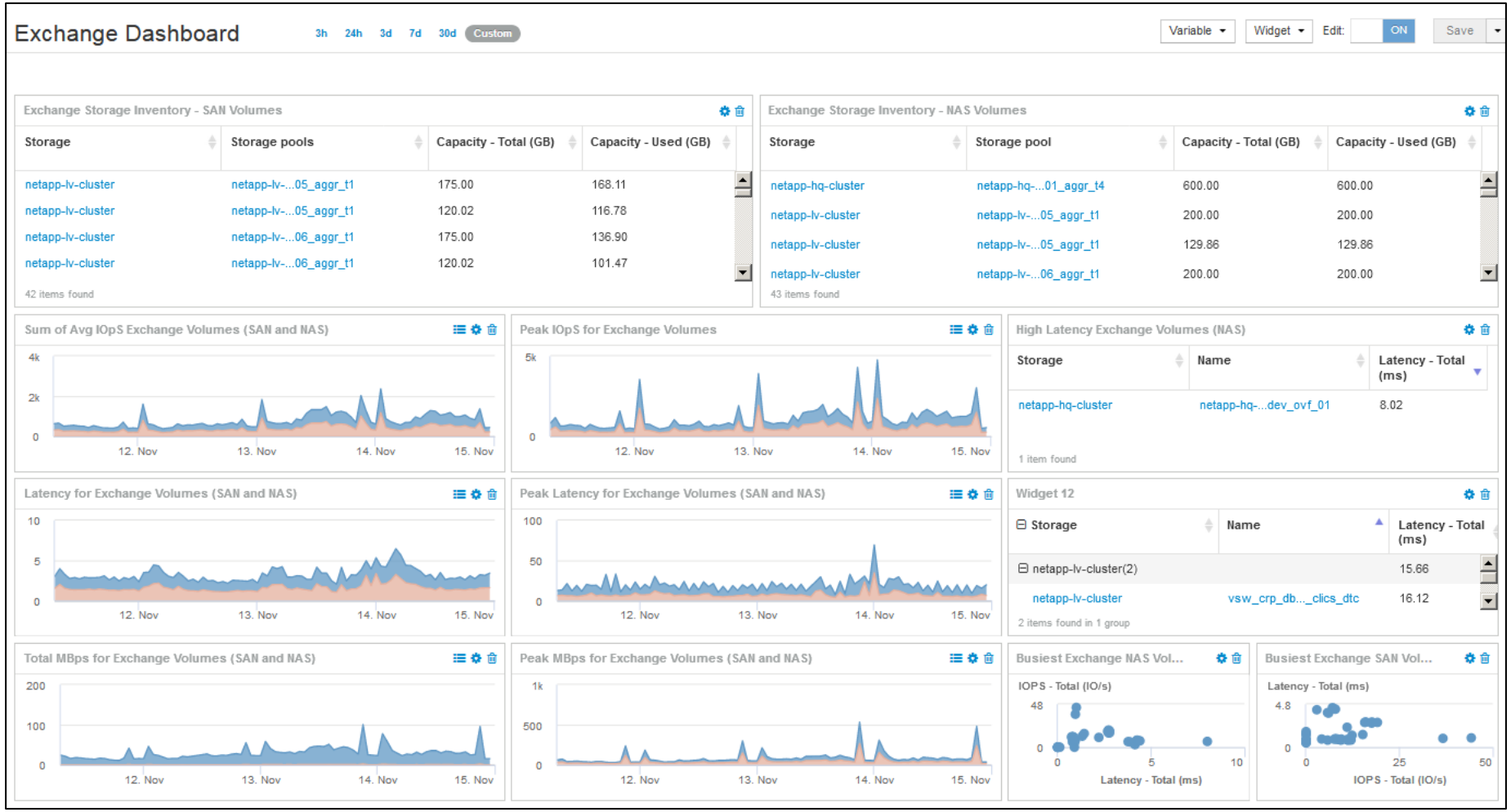
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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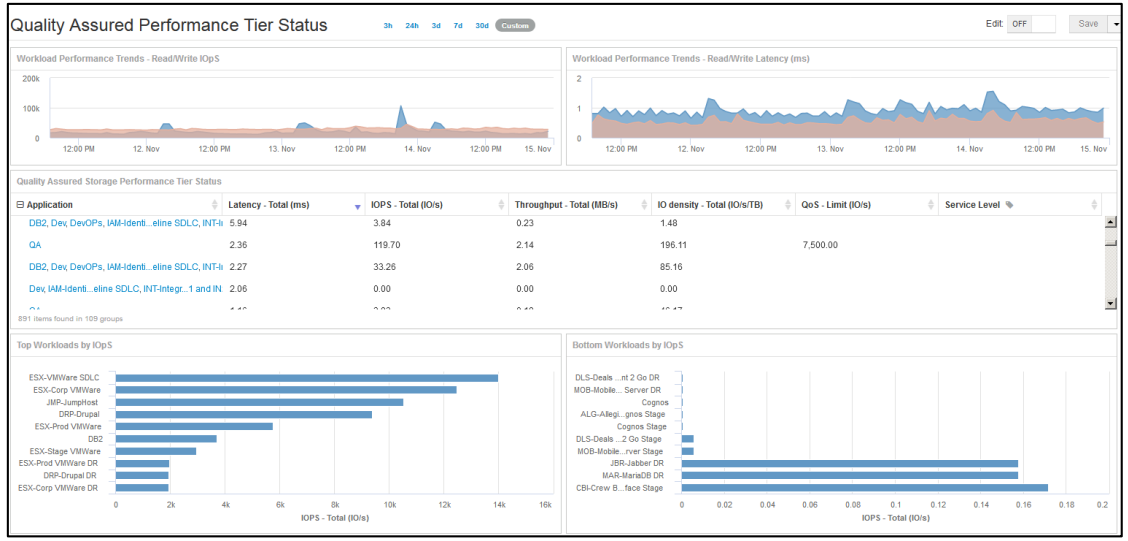
3.19 WebUI – Quality Assured Performance Tier Status

Description: This WebUI based dashboard shows Application/Workload performance trends, top Workloads by IOpS, bottom Workloads by IOpS and Application/Workload inventory. The inventory list shows Application performance metrics, QoS Limits and Service Levels. The idea is to track performance tiers to identify under-performing assets.

Pre-Requisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Application / Workload Service Level	Based on IOpS/TB –Service Level DEFAULTS are defined as follows: • Capacity = IOpS/TB < 128 • Value = IOpS/TB < 512 • Performance = IOpS/TB < 1024 • High Read = IOpS/TB < 2048 • High Write = IOpS/TB < 4096 • Extreme = IOpS/TB > 4096
Date	The date field applied to trending charts and selectable by the user.
Read/Write IOpS	Sum of Average Read and Write IOPS for the user selected time period.
Read/Write Latency	Average Read and Write Latency in milliseconds for the user selected time period.
Latency – Total (ms)	Average Latency in milliseconds (both Read and Write) for the user selected time period.
IOPS – Total (IO/s)	Sum of Average Total IOpS (both Read and Write) for the user selected time period.
Throughput – Total (MB/s)	Sum of Average Total Throughput in MB/second (both Read and Write) for the user selected time period.
IO Density – Total (IO/s/TB)	IOPS / TB (both Read and Write) for the user selected time period.
QoS Limit (IO/s)	The QoS IOpS Limit as configured as a part of the QoS Policy.

Click on the report screen shot above to view an enlarged image.

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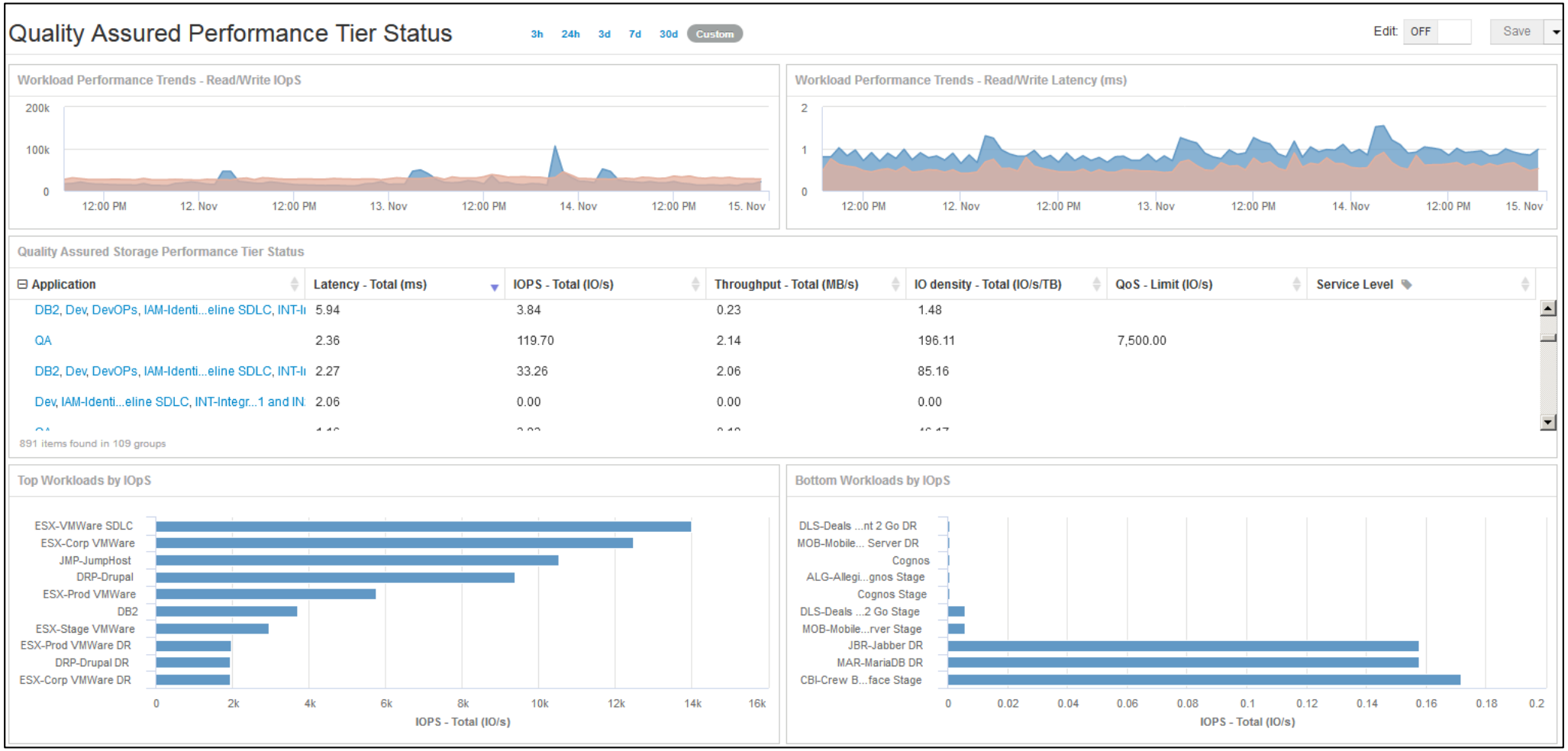

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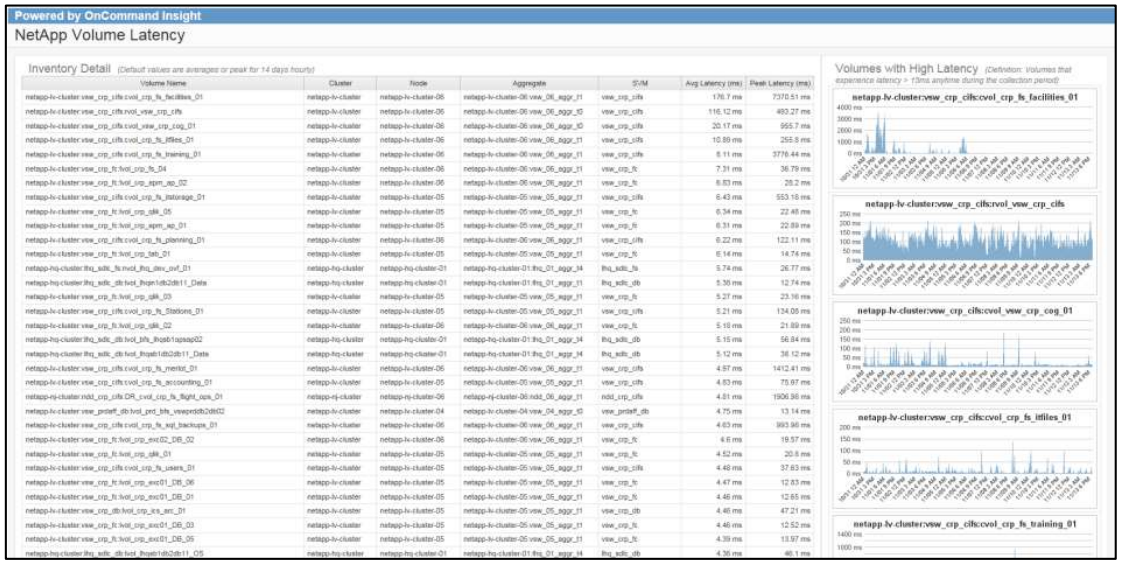
3.20 NetApp Volume Latency

Description: This report lists all NetApp volumes known by OCI and their latency values. The secondary ETL will then parse the data and find volumes with latency greater than 15ms at any point in the selected collection period. Those volumes will be shown on the right with a 14-day hourly performance chart. The user of this report can select volumes associated with certain clusters or nodes, then change the default collection period as desired.

Pre-Requisites: Requires secondary ETL script to run nightly. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Volume	Name of the Volume (or Flexvol) associated with the NetApp Node.
Cluster	Name of the NetApp Cluster (7-mode or CDOT) discovered by OCI.
Node	Name of the storage array (or filer) discovered by OCI. Primarily, this is a member node within a storage cluster (ex. NetApp CDOT).
Aggregate	Name of the Aggregate associated with the Cluster Node.
SVM	Name of the Storage Virtual Machine (Vserver) associated with the Cluster Node.
Avg Latency (ms)	Total Response Time (Latency) in milliseconds averaged hourly for 14 days.
Peak Latency (ms)	Peak Response Time (Latency) in milliseconds averaged hourly for 14 days.
Time	Date/Time series object (MM/DD/YYYY HH:MM:SS)

Click on the report screen shot above to view an enlarged image.

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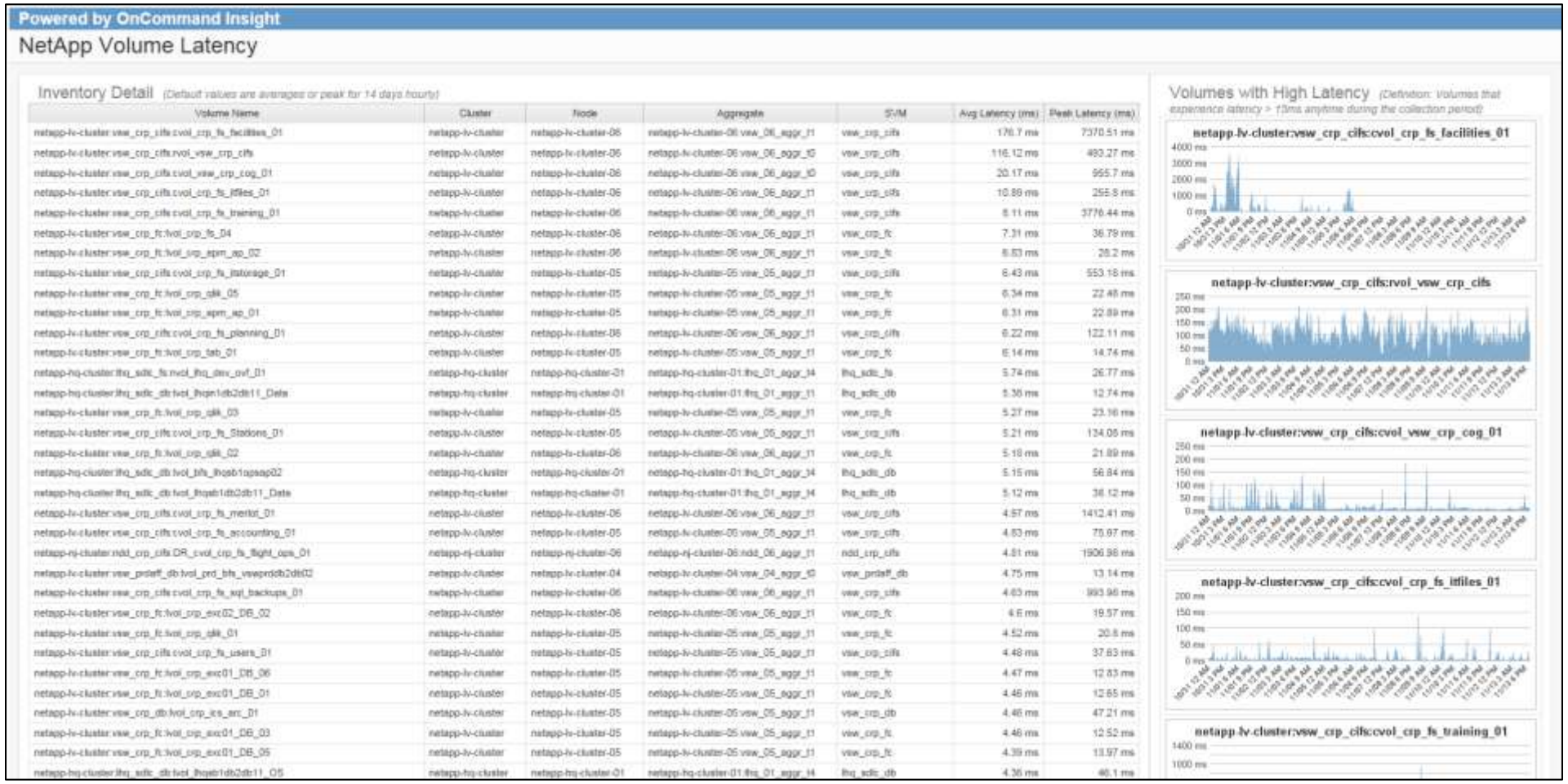
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



Click on the screen shot above to return to the report description.

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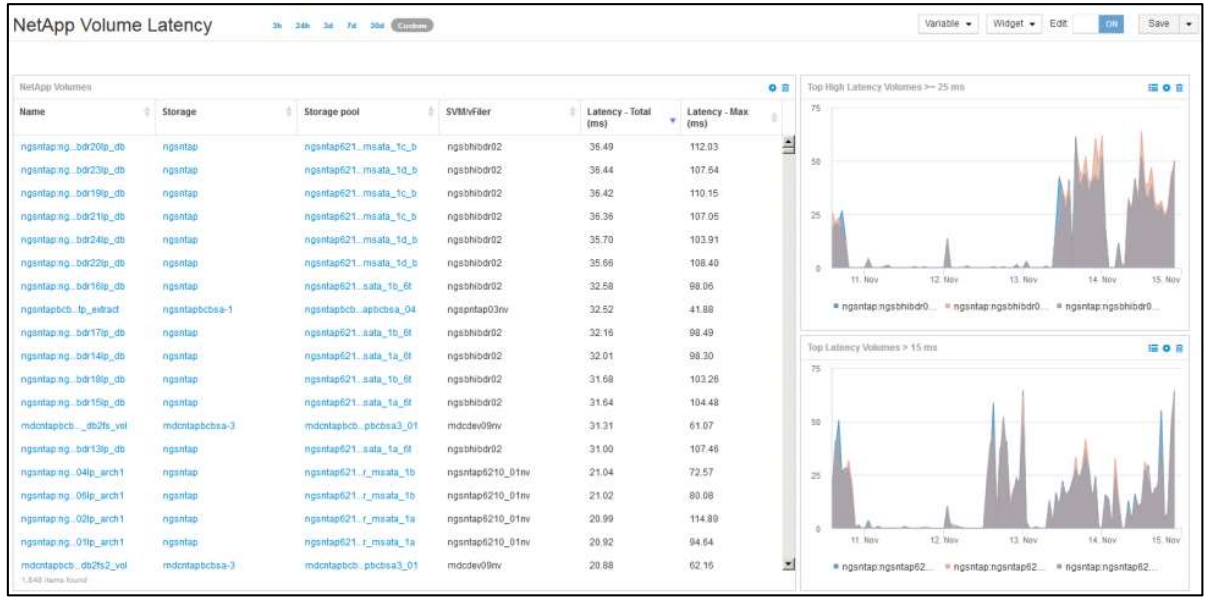
3.20 WebUI – NetApp Volume Latency

Description: This WebUI based dashboard shows NetApp Volume Latency from high to low. A detailed list of volumes is shown on the left. Charts showing top high latency volumes >=25 ms and top high latency volumes > 15ms are visible on the right.

Pre-Requisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Name / Volume	Name of the internal volume (Flexvol) associated with the NetApp storage device monitored by OCI.
Storage	Name of the NetApp storage device monitored by OCI.
Storage pool	Name of the aggregate associated with the NetApp storage device.
SVM/Filer	Name of the Storage Virtual Machine (Vserver) associated with the Cluster Node.
Date	The date field applied to trending charts and selectable by the user.
Latency – Total (ms)	Average Latency in milliseconds (both Read and Write) for the user selected time period.
Latency – Max (ms)	Peak Latency in milliseconds (both Read and Write) for the user selected time period.

Click on the report screen shot above to view an enlarged image.

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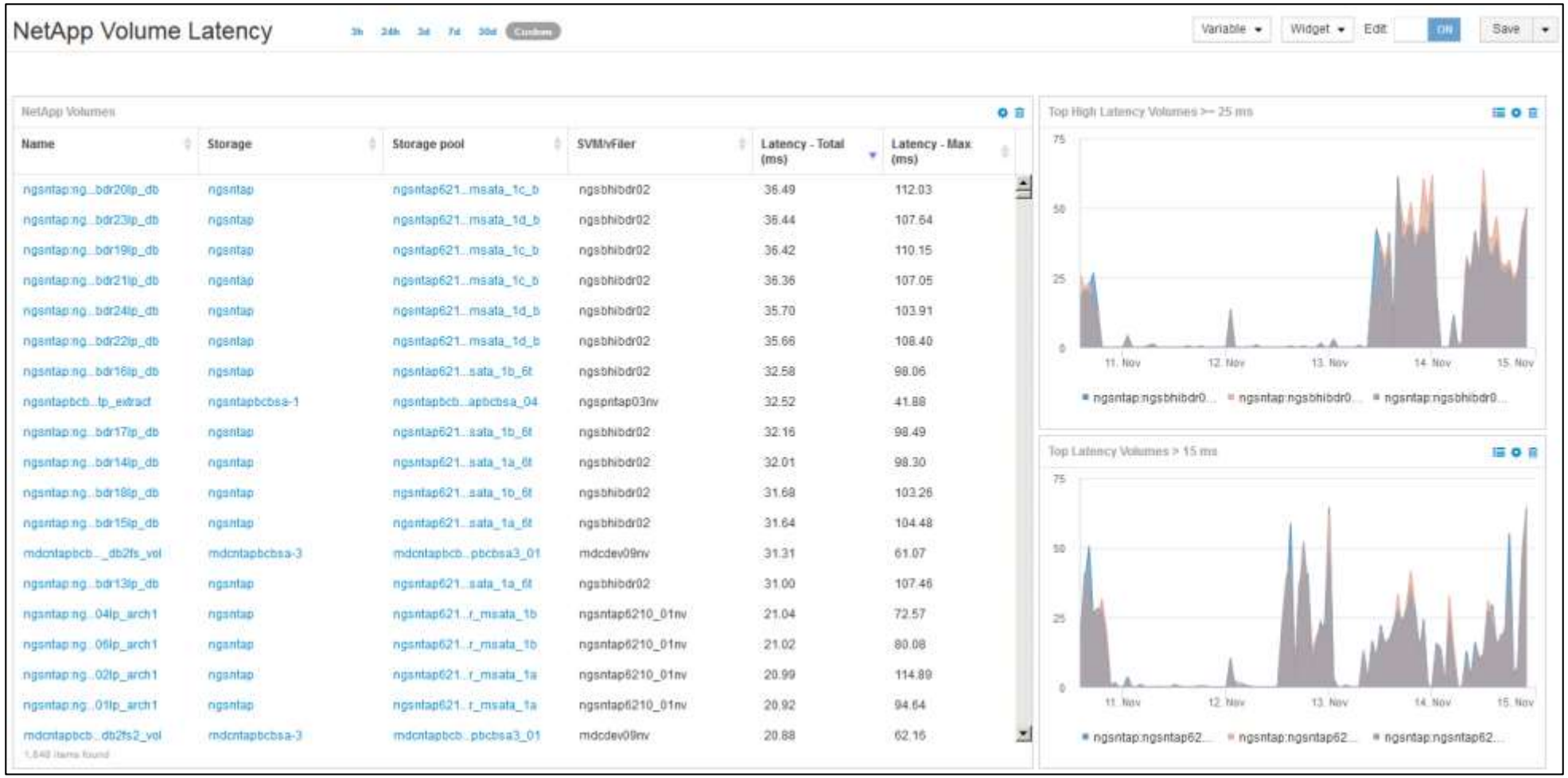
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



Click on the screen shot above to return to the report description.

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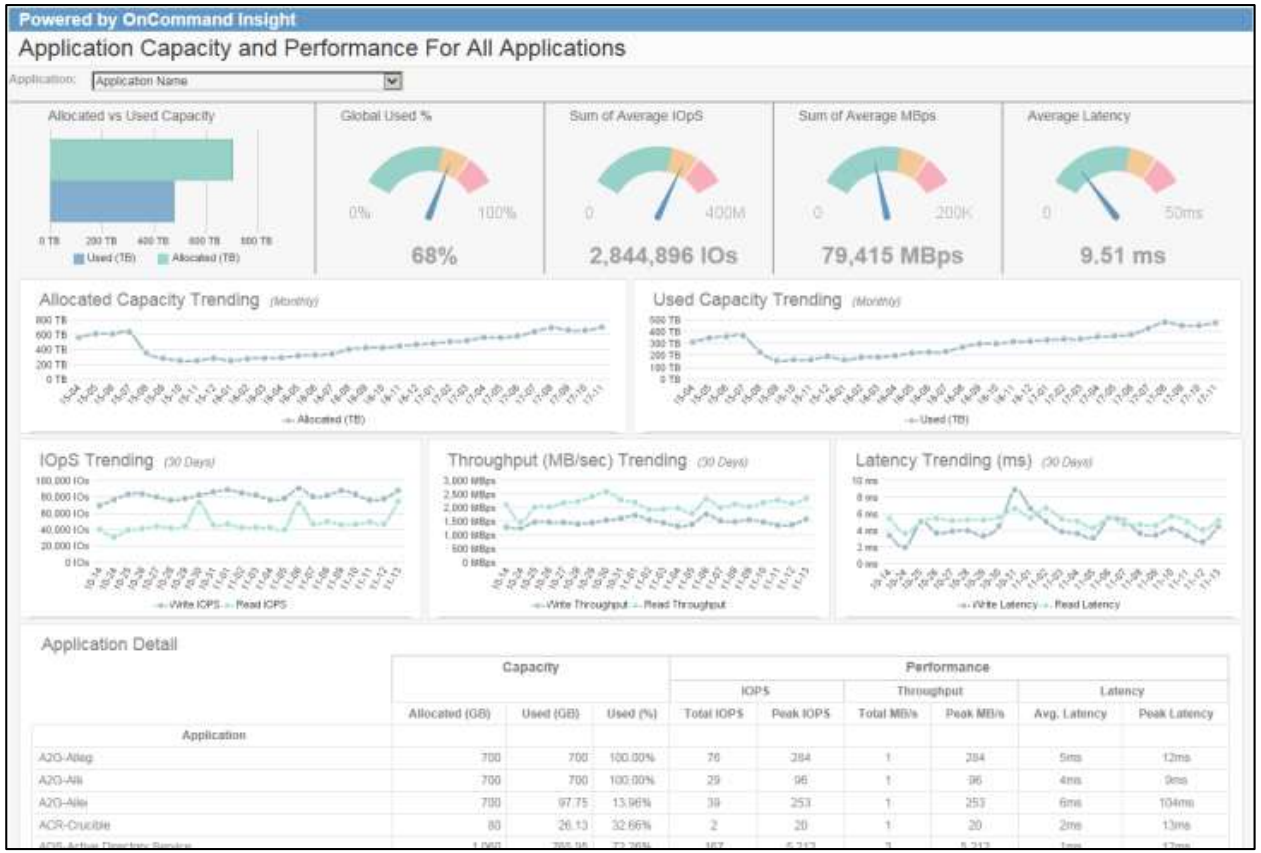
3.21 Application Capacity and Performance (Page 1 of 2)

Description: This dashboard enables the selection of individual applications to present capacity and performance metrics and trends. A comparison of capacity utilization and performance helps identify potential bottlenecks and service disruptions for mission critical applications.

Pre-Requisites: Annotations/definitions are necessary Applications. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

See next page

Click on the report screen shot above to view an enlarged image.

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3.21 Application Capacity and Performance (Page 2 of 2)

Field	Description
Application Name	OCI configured annotation. Defines the application with host or internal volume capacity.
Allocated Capacity TB	Capacity in TB that is provisioned to a host.
Used Capacity TB	Used Capacity in TB, shows block written or data files written if from thin provisioned device, will equal Allocated if thick provisioned.
Used %	Used Capacity TB / Allocated Capacity TB.
Utilization %	Same as Used %.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Write IOpS	Measures the number of I/O WRITE service requests on the volume during the selected time period (measured in I/O per sec).
Read IOpS	Measures the number of I/O READ service requests on the volume during the selected time period (measured in I/O per sec).
Write Throughput	Rate that data is being WRITTEN in a fixed amount of time in response to I/O service requests (measured in MB per sec).
Read Throughput	Rate that data is being READ in a fixed amount of time in response to I/O service requests (measured in MB per sec).
Read Latency	The time it takes from the moment a READ request for information arrives at the storage device to the time when the storage device begin to send the information back in response. This is the actual latency of the device in milliseconds.

Data Dictionary

☐ **Select This Report**

Field	Description
Write Latency	The time it takes from the moment a WRITE request for information arrives at the storage device to the time when the storage device begin to send the information back in response. This is the actual latency of the device in milliseconds.
Total IOpS	Measures the total number of I/O service requests on the volume during the selected time period (measured in I/O per sec).
Peak IOpS	Measures the maximum I/O service requests on the volume during the selected time period (measured in I/O per sec).
Total MB/s	Rate that data is being transmitted in a fixed amount of time in response to I/O service requests (measured in MB per sec).
Peak MB/s	Maximum rate that data is being transmitted in a fixed amount of time in response to I/O service requests (measured in MB per sec).
Avg Latency	The time it takes from the moment a request for information arrives at the storage device to the time when the storage device begin to send the information back in response. This is the actual latency of the device in milliseconds..
Peak Latency	The maximum time it takes from the moment a request for information arrives at the storage device to the time when the storage device begin to send the information back in response. This is the actual latency of the device in milliseconds.

See previous page

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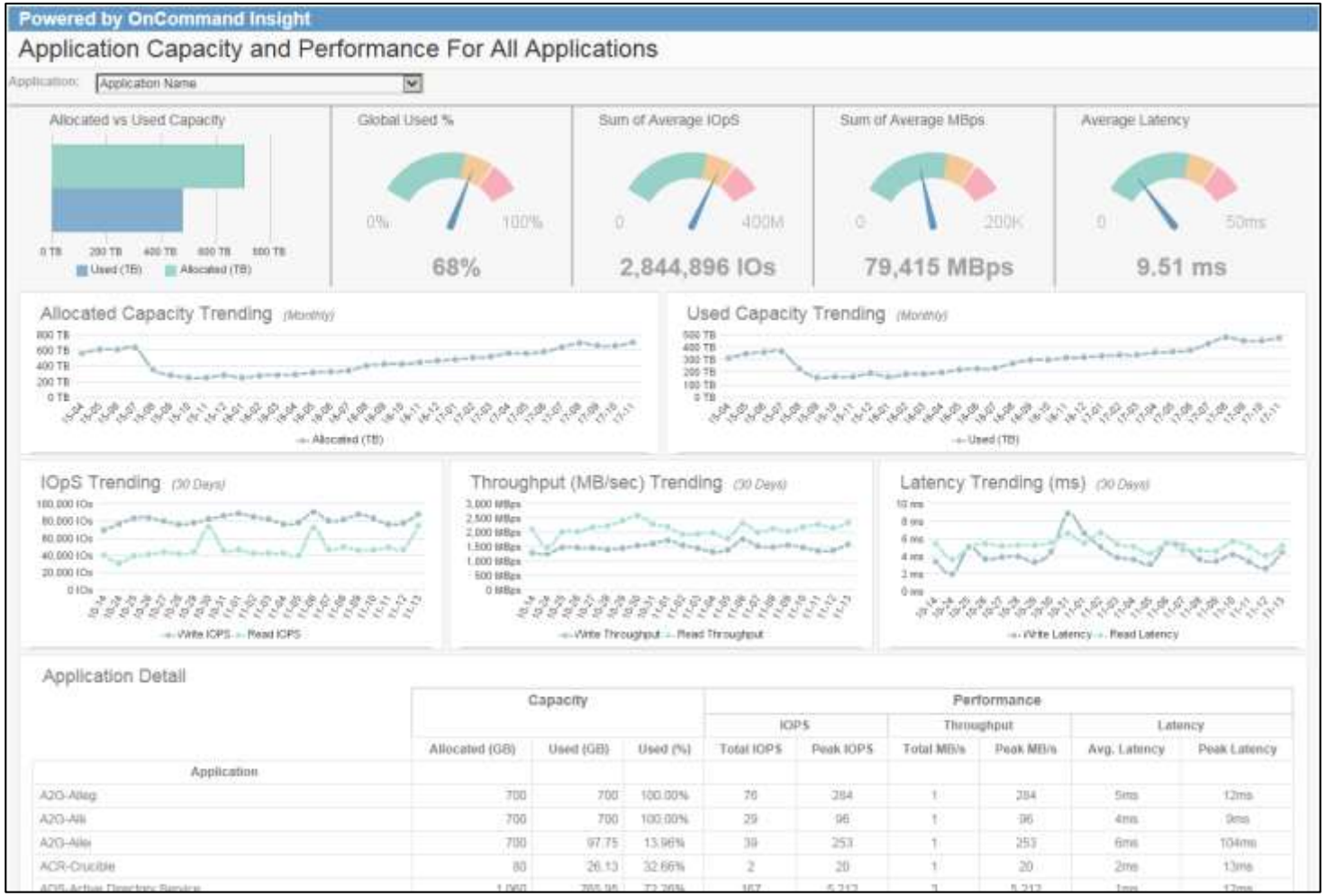
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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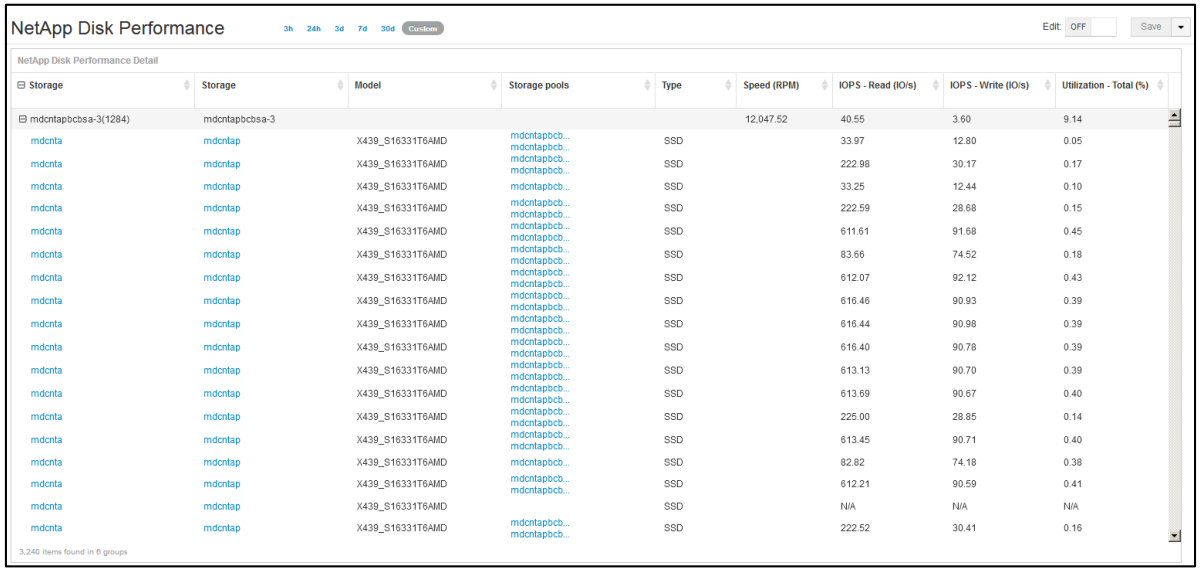
3.22 WebUI - NetApp Disk Performance

Description: This WebUI based dashboard NetApp disk performance metrics.

Pre-Requisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Storage	Storage	Model	Storage pools	Type	Speed (RPM)	IOPS - Read (IO/s)	IOPS - Write (IO/s)	Utilization - Total (%)
mdcntapbcbsa-3(1284)	mdcntapbcbsa-3				12,047.52	40.55	3.60	9.14
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		33.97	12.80	0.05
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		222.98	30.17	0.17
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb...	SSD		33.25	12.44	0.10
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		222.59	28.68	0.15
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		611.61	91.68	0.45
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		83.66	74.52	0.18
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		612.07	92.12	0.43
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		616.46	90.93	0.39
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		616.44	90.98	0.39
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		616.40	90.78	0.39
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		613.13	90.70	0.39
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		613.69	90.67	0.40
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		225.00	28.85	0.14
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		613.45	90.71	0.40
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb...	SSD		82.82	74.18	0.38
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		612.21	90.59	0.41
mdcnta	mdcntap	X439_S16331T6AMD		SSD		N/A	N/A	N/A
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		222.52	30.41	0.16

Data Dictionary

☐ **Select This Report**

Field	Description
Storage	Name of the NetApp storage device monitored by OCI.
Model	Name of the Model associated with the NetApp storage device.
Storage pools	Name of the aggregate associated with the NetApp storage device.
Type	Disk type (e.g. SSD, SAS, SATA, FC, etc.)
Speed (RPM)	Speed of the disk in revolutions per minute. SSD disks will not display RPMs as they are not a spinning disk.
IOPS – Read (IO/s)	Sum of Average Read IOPS for the user selected time period.
IOPS – Write (IO/s)	Sum of Average Write IOPS for the user selected time period.
Utilization – Total (%)	The percentage % of post-cache service time used for requests out of the available sample time. This metric indicates what portion of the time the disk is busy servicing requests.
Date	The date field applied to trending charts and selectable by the user.

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NetApp Disk Performance

3h 24h 3d 7d 30d Custom

Edit: OFF Save

NetApp Disk Performance Detail

Storage	Storage	Model	Storage pools	Type	Speed (RPM)	IOPS - Read (IO/s)	IOPS - Write (IO/s)	Utilization - Total (%)
mdcntapbcbsa-3(1284)	mdcntapbcbsa-3				12,047.52	40.55	3.60	9.14
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		33.97	12.80	0.05
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		222.98	30.17	0.17
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb...	SSD		33.25	12.44	0.10
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		222.59	28.68	0.15
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		611.61	91.68	0.45
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		83.66	74.52	0.18
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		612.07	92.12	0.43
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		616.46	90.93	0.39
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		616.44	90.98	0.39
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		616.40	90.78	0.39
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		613.13	90.70	0.39
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		613.69	90.67	0.40
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		225.00	28.85	0.14
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		613.45	90.71	0.40
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb...	SSD		82.82	74.18	0.38
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		612.21	90.59	0.41
mdcnta	mdcntap	X439_S16331T6AMD		SSD		N/A	N/A	N/A
mdcnta	mdcntap	X439_S16331T6AMD	mdcntapbcb... mdcntapbcb...	SSD		222.52	30.41	0.16

3,240 items found in 6 groups

 Click on the screen shot above to return to the report description.

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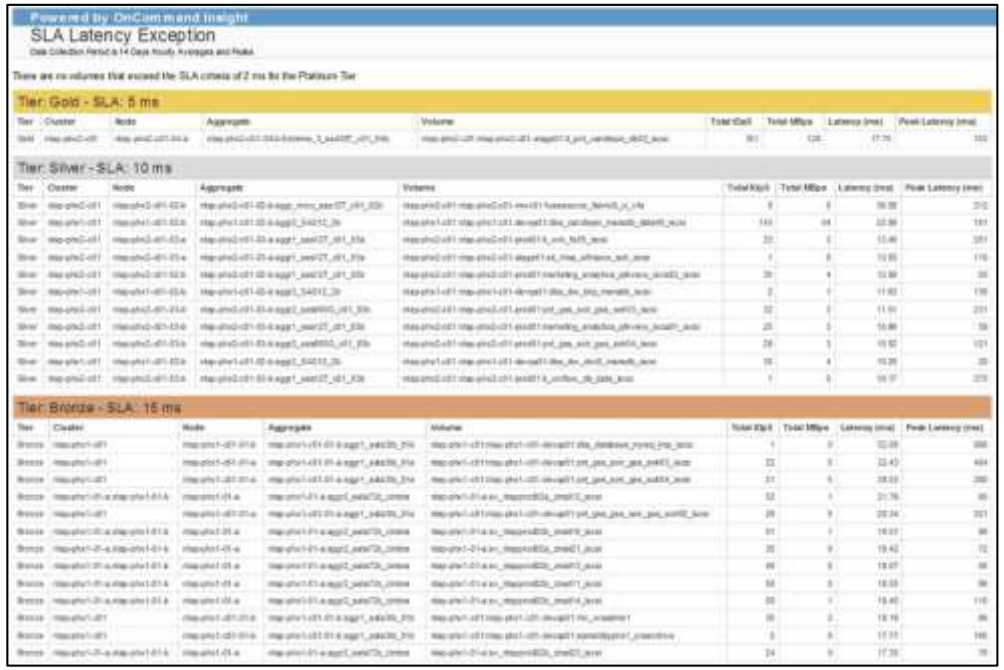
3.24 SLA Latency Exceptions

Description: This operations level report shows Volumes by Tier that exceed SLA latency thresholds. This report is easily modified to change SLA values based on individual customer requirements. The example is based on Platinum, Gold, Silver and Bronze Tier structures with SLA's pre-defined. The report will only show volumes for each Tier that exceed the SLA.

Pre-Requisites: Annotations/definitions are necessary for Service Level/Tier. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Tier	Name of the physical storage tier configured within OCI.
Cluster	Name of the NetApp Cluster discovered by OCI.
Node	Name of the NetApp Node associated with the NetApp Cluster discovered by OCI.
Aggregate	Name of the Aggregate associated with the NetApp Node.
Volume	Name of the Volume (Flexvol) associated with the NetApp Node.
Total IOpS	Sum of Average IOpS (both Read and Write) as reported by the volume hourly for 14 days.
Total MBps	Total Throughput (both Read and Write) in MB/sec averaged hourly for 14 days.
Latency (ms)	Total Response Time (Latency) in milliseconds averaged hourly for 14 days.
Peak Latency (ms)	Peak Response Time (Latency) in milliseconds averaged hourly for 14 days.

Click on the report screen shot above to view an enlarged image.

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Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary

Powered by OnCommand Insight

SLA Latency Exception

Data Collection Period is 14 Days Hourly Averages and Peaks

There are no volumes that exceed the SLA criteria of 2 ms for the Platinum Tier

Tier: Gold - SLA: 5 ms

Tier	Cluster	Node	Aggregate	Volume	Total IOps	Total MBps	Latency (ms)	Peak Latency (ms)
Gold	ntap-phx2-c01	ntap-phx2-c01-04-b	ntap-phx2-c01-04-b:Extreme_3_sas38T_c01_04b	ntap-phx2-c01:ntap-phx2-c01-stage01:it_pnt_candlepin_db02_iscsi	351	120	17.75	152

Tier: Silver - SLA: 10 ms

Tier	Cluster	Node	Aggregate	Volume	Total IOps	Total MBps	Latency (ms)	Peak Latency (ms)
Silver	ntap-phx2-c01	ntap-phx2-c01-02-b	ntap-phx2-c01-02-b:aggr_mwc_sas12T_c01_02b	ntap-phx2-c01:ntap-phx2-c01-mwc01:fusesource_fabric8_c_nfs	0	0	36.56	212
Silver	ntap-phx1-c01	ntap-phx1-c01-02-b	ntap-phx1-c01-02-b:aggr2_SAS12_2b	ntap-phx1-c01:ntap-phx1-c01-devqa01:dba_candlepin_mariadb_data06_iscsi	143	44	22.96	101
Silver	ntap-phx2-c01	ntap-phx2-c01-03-a	ntap-phx2-c01-03-a:aggr1_sas12T_c01_03a	ntap-phx2-c01:ntap-phx2-c01-prod01:it_wis_fs05_iscsi	23	3	13.40	251
Silver	ntap-phx2-c01	ntap-phx2-c01-03-a	ntap-phx2-c01-03-a:aggr1_sas12T_c01_03a	ntap-phx2-c01:ntap-phx2-c01-stage01:sit_rhas_alfresco_solr_iscsi	1	0	13.03	110
Silver	ntap-phx2-c01	ntap-phx2-c01-02-b	ntap-phx2-c01-02-b:aggr1_sas12T_c01_02b	ntap-phx2-c01:ntap-phx2-c01-prod01:marketing_analytics_qlikview_iscsi02_iscsi	35	4	12.08	55
Silver	ntap-phx1-c01	ntap-phx1-c01-02-b	ntap-phx1-c01-02-b:aggr2_SAS12_2b	ntap-phx1-c01:ntap-phx1-c01-devqa01:dba_dw_bkp_mariadb_iscsi	2	1	11.63	136
Silver	ntap-phx2-c01	ntap-phx2-c01-03-b	ntap-phx2-c01-03-b:aggr2_sas600G_c01_03b	ntap-phx2-c01:ntap-phx2-c01-prod01:pnt_gss_solr_gss_solr03_iscsi	32	3	11.51	231
Silver	ntap-phx2-c01	ntap-phx2-c01-03-b	ntap-phx2-c01-03-b:aggr1_sas12T_c01_03b	ntap-phx2-c01:ntap-phx2-c01-prod01:marketing_analytics_qlikview_iscsi01_iscsi	25	3	10.86	39
Silver	ntap-phx2-c01	ntap-phx2-c01-03-b	ntap-phx2-c01-03-b:aggr2_sas600G_c01_03b	ntap-phx2-c01:ntap-phx2-c01-prod01:pnt_gss_solr_gss_solr04_iscsi	29	3	10.52	121
Silver	ntap-phx1-c01	ntap-phx1-c01-02-b	ntap-phx1-c01-02-b:aggr2_SAS12_2b	ntap-phx1-c01:ntap-phx1-c01-devqa01:dba_dw_dev0_mariadb_iscsi	30	4	10.20	20
Silver	ntap-phx2-c01	ntap-phx2-c01-03-b	ntap-phx2-c01-03-b:aggr1_sas12T_c01_03b	ntap-phx2-c01:ntap-phx2-c01-prod01:it_uniflow_db_data_iscsi	1	0	10.17	375

Tier: Bronze - SLA: 15 ms

Tier	Cluster	Node	Aggregate	Volume	Total IOps	Total MBps	Latency (ms)	Peak Latency (ms)
Bronze	ntap-phx1-c01	ntap-phx1-c01-01-b	ntap-phx1-c01-01-b:aggr1_sata3tb_01b	ntap-phx1-c01:ntap-phx1-c01-devqa01:dba_database_mysql_tmp_iscsi	1	0	52.80	896
Bronze	ntap-phx1-c01	ntap-phx1-c01-01-a	ntap-phx1-c01-01-a:aggr1_sata3tb_01a	ntap-phx1-c01:ntap-phx1-c01-devqa01:pnt_gss_solr_gss_solr03_iscsi	22	5	32.43	484
Bronze	ntap-phx1-c01	ntap-phx1-c01-01-a	ntap-phx1-c01-01-a:aggr1_sata3tb_01a	ntap-phx1-c01:ntap-phx1-c01-devqa01:pnt_gss_solr_gss_solr04_iscsi	21	5	29.52	290
Bronze	ntap-phx1-01-a,ntap-phx1-01-b	ntap-phx1-01-a	ntap-phx1-01-a:aggr2_sata72k_zimbra	ntap-phx1-01-a:sv_ntapprod02a_mail12_iscsi	52	1	21.79	90
Bronze	ntap-phx1-c01	ntap-phx1-c01-01-a	ntap-phx1-c01-01-a:aggr1_sata3tb_01a	ntap-phx1-c01:ntap-phx1-c01-devqa01:pnt_gss_gss_solr_gss_solr02_iscsi	26	5	20.34	321
Bronze	ntap-phx1-01-a,ntap-phx1-01-b	ntap-phx1-01-a	ntap-phx1-01-a:aggr2_sata72k_zimbra	ntap-phx1-01-a:sv_ntapprod02b_mail15_iscsi	51	1	19.57	96
Bronze	ntap-phx1-01-a,ntap-phx1-01-b	ntap-phx1-01-a	ntap-phx1-01-a:aggr2_sata72k_zimbra	ntap-phx1-01-a:sv_ntapprod02a_mail21_iscsi	35	0	19.42	72
Bronze	ntap-phx1-01-a,ntap-phx1-01-b	ntap-phx1-01-a	ntap-phx1-01-a:aggr2_sata72k_zimbra	ntap-phx1-01-a:sv_ntapprod02b_mail13_iscsi	46	0	19.07	58
Bronze	ntap-phx1-01-a,ntap-phx1-01-b	ntap-phx1-01-a	ntap-phx1-01-a:aggr2_sata72k_zimbra	ntap-phx1-01-a:sv_ntapprod02b_mail11_iscsi	50	0	18.55	96
Bronze	ntap-phx1-01-a,ntap-phx1-01-b	ntap-phx1-01-a	ntap-phx1-01-a:aggr2_sata72k_zimbra	ntap-phx1-01-a:sv_ntapprod02b_mail14_iscsi	50	1	18.45	110
Bronze	ntap-phx1-c01	ntap-phx1-c01-01-b	ntap-phx1-c01-01-b:aggr1_sata3tb_01b	ntap-phx1-c01:ntap-phx1-c01-devqa01:rhn_snsadmin1	35	2	18.16	88
Bronze	ntap-phx1-c01	ntap-phx1-c01-01-b	ntap-phx1-c01-01-b:aggr1_sata3tb_01b	ntap-phx1-c01:ntap-phx1-c01-devqa01:epmsldbphx1_snaarchive	5	0	17.77	195
Bronze	ntap-phx1-01-a,ntap-phx1-01-b	ntap-phx1-01-a	ntap-phx1-01-a:aggr2_sata72k_zimbra	ntap-phx1-01-a:sv_ntapprod02b_mail23_iscsi	24	0	17.30	76

Click on the screen shot above to return to the report description.

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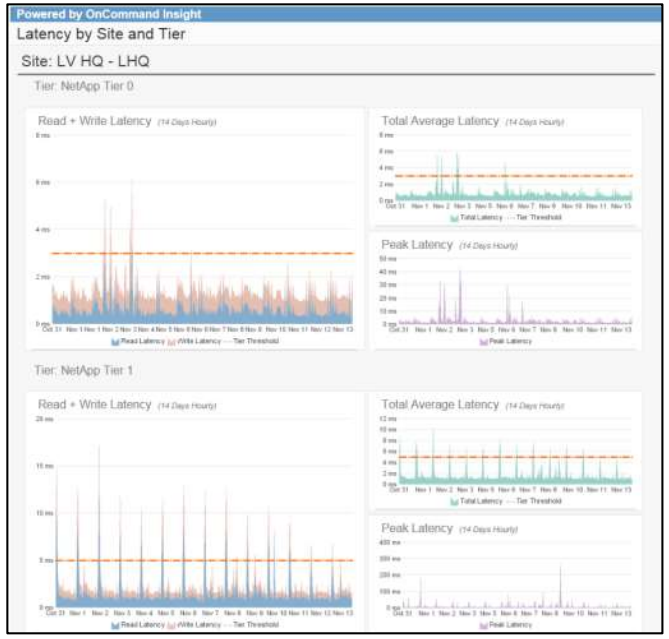
3.25 Latency by Site and Tier

Description: This operations level report shows Latency charts and thresholds by Site/Data Center and Tier. The Report Query that supports the chart structure in Cognos contains a data item field called 'Threshold'. This field can be modified with the appropriate SLA latency values per configured Tier.

Pre-Requisites: Annotations/definitions are necessary for Data Center and Service Level/Tier. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	OCI configured annotation. Defines the location or Data Center associated with the specific device.
Tier	OCI configured annotation. Defines tiers of storage based on disk type, disk speed, storage array or pool, etc.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
ReadLatency (ms)	The time it takes from the moment a READ request for information arrives at the storage device to the time when the storage device begin to send the information back in response. This is the actual latency of the device in milliseconds. Collected hourly for a period of 14 days.
Write Latency (ms)	The time it takes from the moment a WRITE request for information arrives at the storage device to the time when the storage device begin to send the information back in response. This is the actual latency of the device in milliseconds. Collected hourly for a period of 14 days.
Total Latency (ms)	The time it takes from the moment a request for information arrives at the storage device to the time when the storage device begin to send the information back in response. This is the actual latency of the device in milliseconds. Collected hourly for a period of 14 days.
Peak Latency (ms)	The maximum time it takes from the moment a request for information arrives at the storage device to the time when the storage device begin to send the information back in response. This is the actual latency of the device in milliseconds. Collected hourly for a period of 14 days.

Click on the report screen shot above to view an enlarged image.

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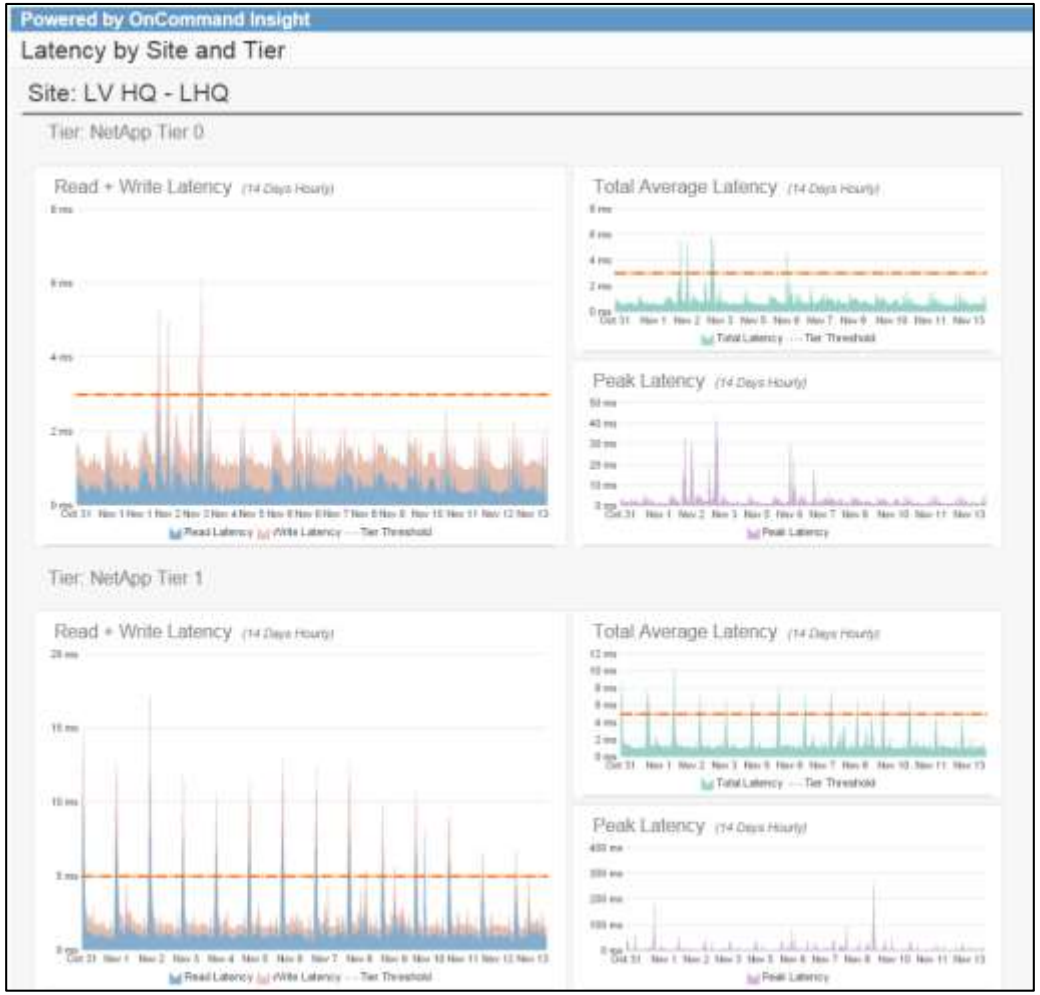
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



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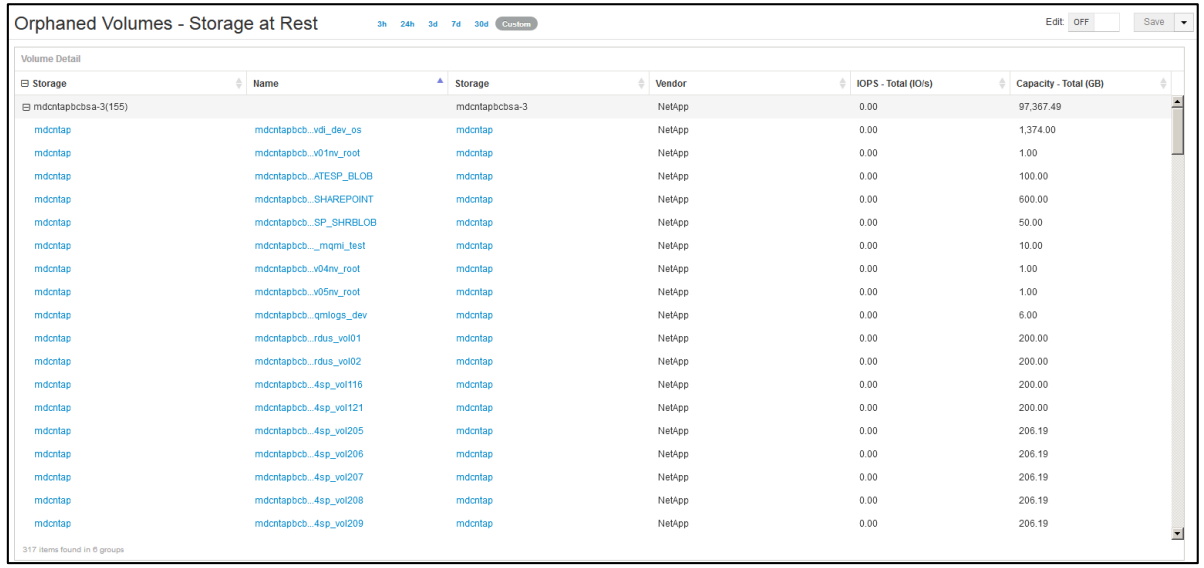
3.26 WebUI – Orphaned Volumes – Storage at Rest

Description: This WebUI based dashboard showing volumes that are orphaned by performance. The criteria is user selectable though the recommendation is ninety (90) days of IOpS that are equal to zero (0).

Pre-Requisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Storage	Name	Storage	Vendor	IOPS - Total (IO/s)	Capacity - Total (GB)
mdcntapbcbsa-3(155)		mdcntapbcbsa-3	NetApp	0.00	97,367.49
mdcntap	mdcntapbcb...vdi_dev_os	mdcntap	NetApp	0.00	1,374.00
mdcntap	mdcntapbcb...v01nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...ATESP_BLOB	mdcntap	NetApp	0.00	100.00
mdcntap	mdcntapbcb...SHAREPOINT	mdcntap	NetApp	0.00	600.00
mdcntap	mdcntapbcb...SP_SHRBLOB	mdcntap	NetApp	0.00	50.00
mdcntap	mdcntapbcb..._mqmi_test	mdcntap	NetApp	0.00	10.00
mdcntap	mdcntapbcb...v04nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...v05nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...qmlogs_dev	mdcntap	NetApp	0.00	6.00
mdcntap	mdcntapbcb...rdus_vol01	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...rdus_vol02	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol116	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol121	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol205	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol206	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol207	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol208	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol209	mdcntap	NetApp	0.00	206.19

Data Dictionary

☐ **Select This Report**

Field	Description
Storage	Name of the storage device monitored by OCI.
Name / Volume	Name of the volume associated with the storage device monitored by OCI.
Vendor	Name of the manufacturer associated with the storage device monitored by OCI.
Date	The date field applied to trending charts and selectable by the user.
IOPS – Total (IO/s)	Measures the average total number of I/O service requests on the volume (measured in I/O per sec) for the user selected time period.
Capacity – Total (GB)	Volume or Internal volume capacity allocated to host initiators.

Click on the report screen shot above to view an enlarged image.

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Orphaned Volumes - Storage at Rest

3h 24h 3d 7d 30d Custom

Edit: OFF Save

Volume Detail

Storage	Name	Storage	Vendor	IOPS - Total (IO/s)	Capacity - Total (GB)
mdcntapbcbsa-3(155)		mdcntapbcbsa-3	NetApp	0.00	97,367.49
mdcntap	mdcntapbcb...vdi_dev_os	mdcntap	NetApp	0.00	1,374.00
mdcntap	mdcntapbcb...v01nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...ATESP_BLOB	mdcntap	NetApp	0.00	100.00
mdcntap	mdcntapbcb...SHAREPOINT	mdcntap	NetApp	0.00	600.00
mdcntap	mdcntapbcb...SP_SHRBLOB	mdcntap	NetApp	0.00	50.00
mdcntap	mdcntapbcb..._mqmi_test	mdcntap	NetApp	0.00	10.00
mdcntap	mdcntapbcb...v04nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...v05nv_root	mdcntap	NetApp	0.00	1.00
mdcntap	mdcntapbcb...qmlogs_dev	mdcntap	NetApp	0.00	6.00
mdcntap	mdcntapbcb...rdus_vol01	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...rdus_vol02	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol116	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol121	mdcntap	NetApp	0.00	200.00
mdcntap	mdcntapbcb...4sp_vol205	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol206	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol207	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol208	mdcntap	NetApp	0.00	206.19
mdcntap	mdcntapbcb...4sp_vol209	mdcntap	NetApp	0.00	206.19

317 items found in 6 groups

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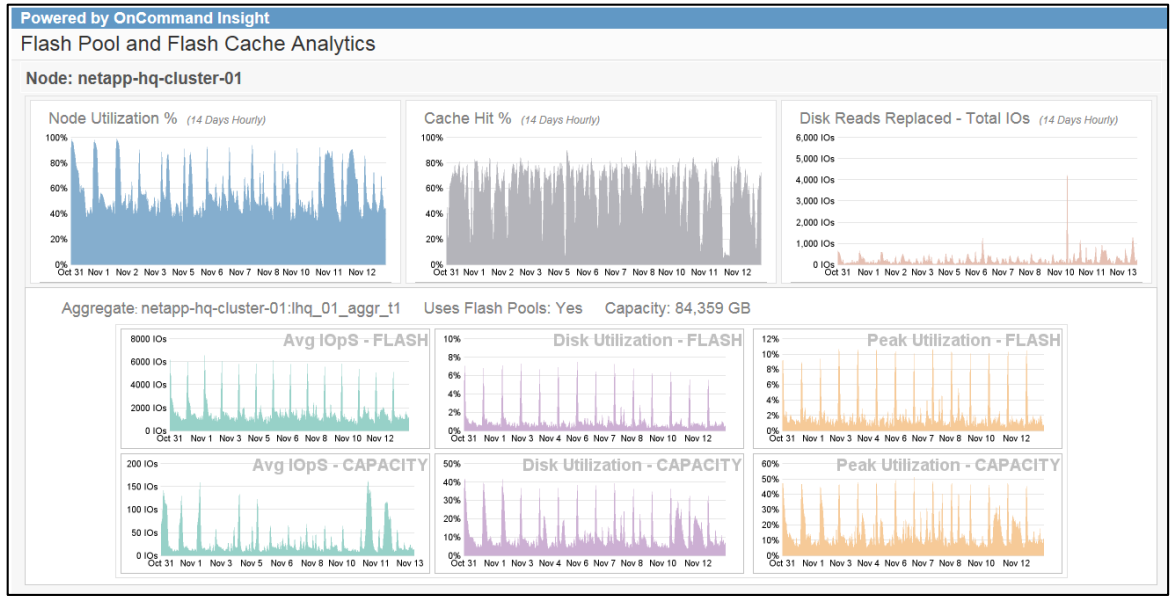
3.27 Flash Pool and Flash Cache Analytics

Description: This report shows performance results of NetApp Storage Node utilization %, Cache Hit % and Disk Reads Replaced. On the lower half, each Flash Pool enabled aggregate is visible showing Average IOpS for FLASH (SSD) disks, disk utilization and peak disk utilization for FLASH disks. Then on the bottom, the same metrics for Capacity disks e.g. SATA, FC, SAS, etc. Collection time is 14 days hourly.

Pre-Requisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Node	The storage node associated with the 7-Mode or CDOT cluster discovered by OCI.
Aggregate	The name of the aggregate or storage pool associated with the storage node.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Capacity (GB)	Total Usable Capacity in GB of the Aggregate (post RAID)
Utilization %	Average Utilization of the Node (CPU+WAFL_ex+Kahuna Domain) hourly for 14 days.
Cache Hit %	Average Cache Hit % for 14 days hourly.
Disk Reads Replaced	Amount of Total IO disk reads that were replaced by cache.
Disk Utilization	Average Disk Utilization % reported by the disks that support the storage pools or aggregates hourly for 14 days.
Peak Disk Utilization	Peak disk utilization for 14 days hourly.
Avg IOpS	Sum of Average IOpS as reported by the volumes associated with aggregates hourly for 14 days.

Click on the report screen shot above to view an enlarged image.

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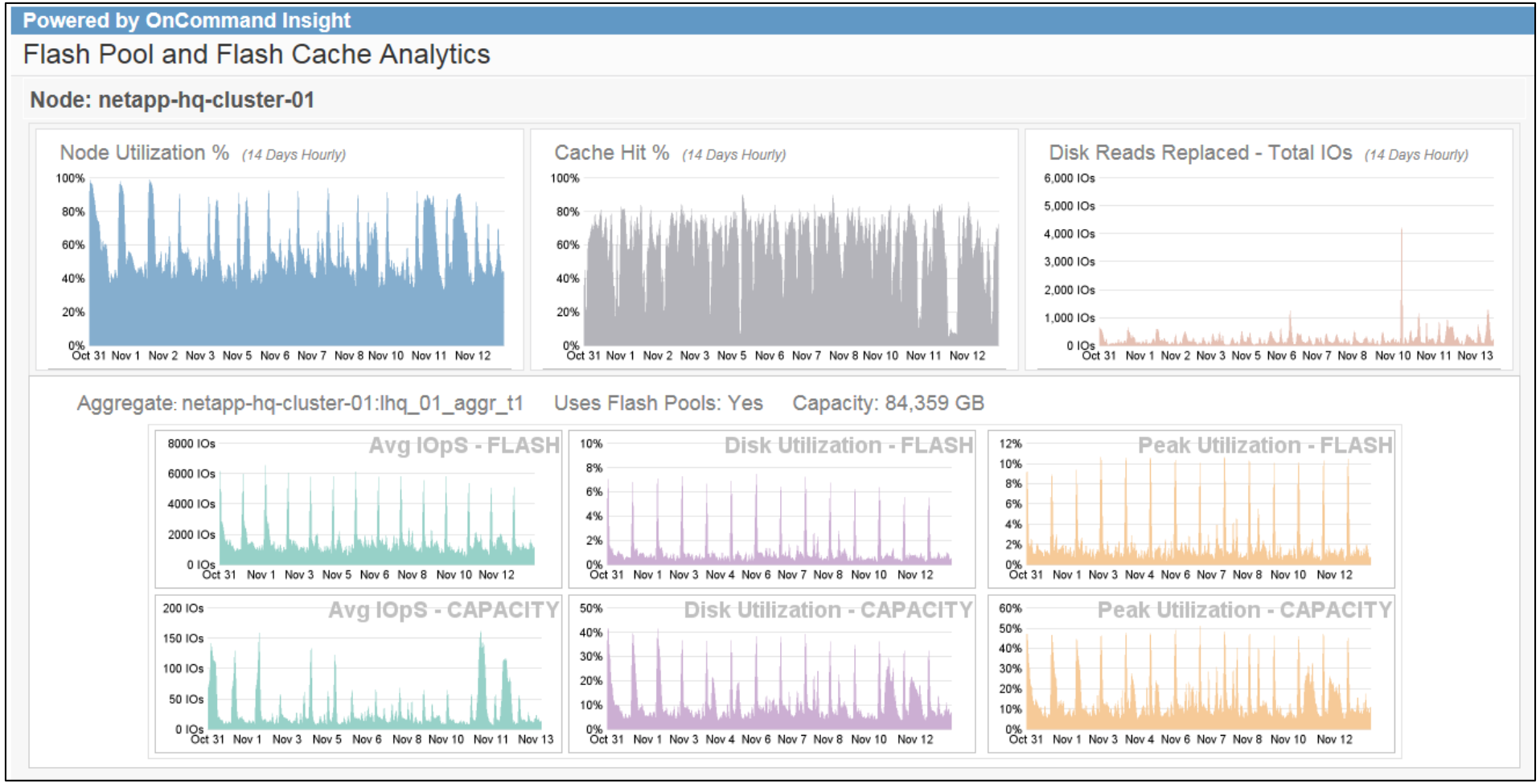

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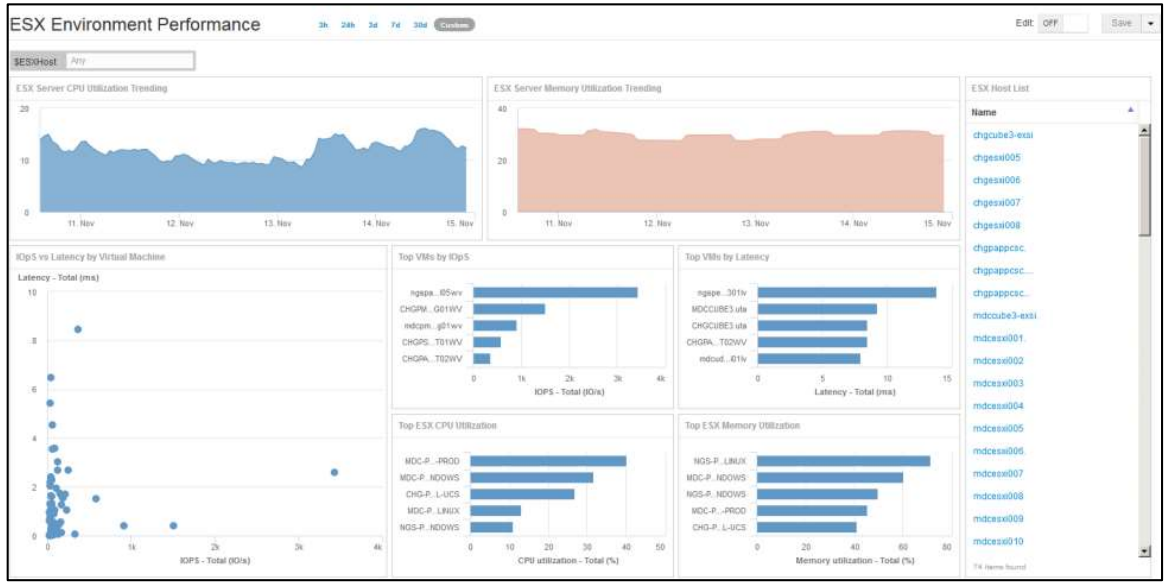
3.28 WebUI – ESX Environment Performance

Description: This WebUI based dashboard provides visibility into ESX Server performance. Individual ESX servers can be displayed by typing in the server name at the top left. CPU and Memory Utilization trending charts are shown at top. A list of ESX Host servers are available on the right with drill down capability. A bubble chart showing IOpS vs Latency by Virtual Machine and Top VMs and ESX by IOpS, Latency, CPU and Memory Utilization round out the report.

Pre-Requisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
$ESXHost	Dashboard variable used to filter the report for individual ESX Hosts.
Name / ESX Host	Name of the ESX Host/Server monitored by OCI.
Date	The date field applied to trending charts and selectable by the user.
CPU Utilization	ESX Host/Server CPU Utilization % or the user selected time period.
Memory Utilization	ESX Host/Server Memory Utilization % or the user selected time period.
IOpS – Total (IO/s)	Sum of Average IOpS (both Read and Write) as reported by the volumes that support datastores for each ESX Server for the user selected time period.
Latency – Total (ms)	Average Latency in milliseconds (both Read and Write) as reported by the volumes that support datastores for each ESX Server for the user selected time period.

Click on the report screen shot above to view an enlarged image.

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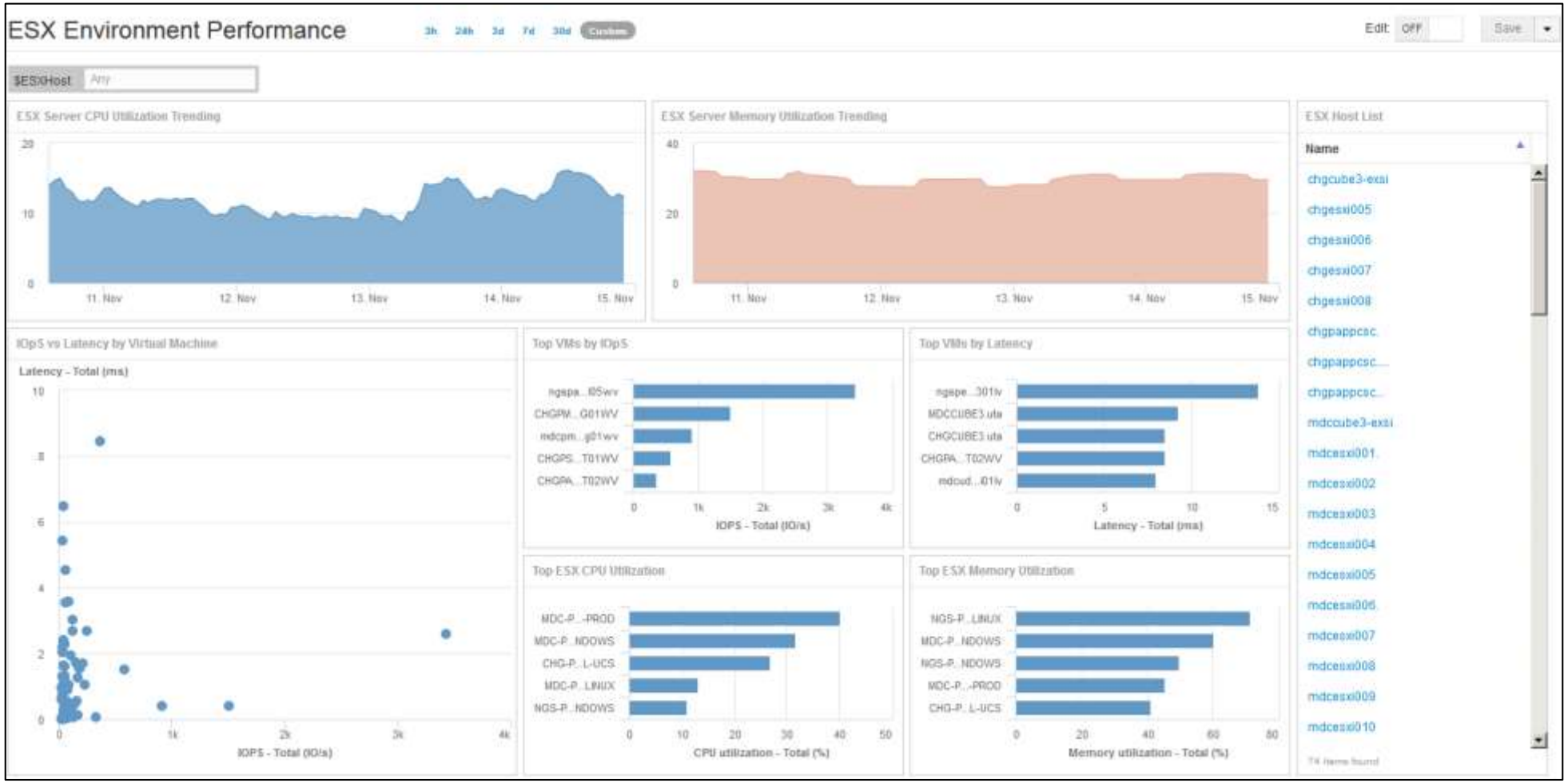
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



Click on the screen shot above to return to the report description.

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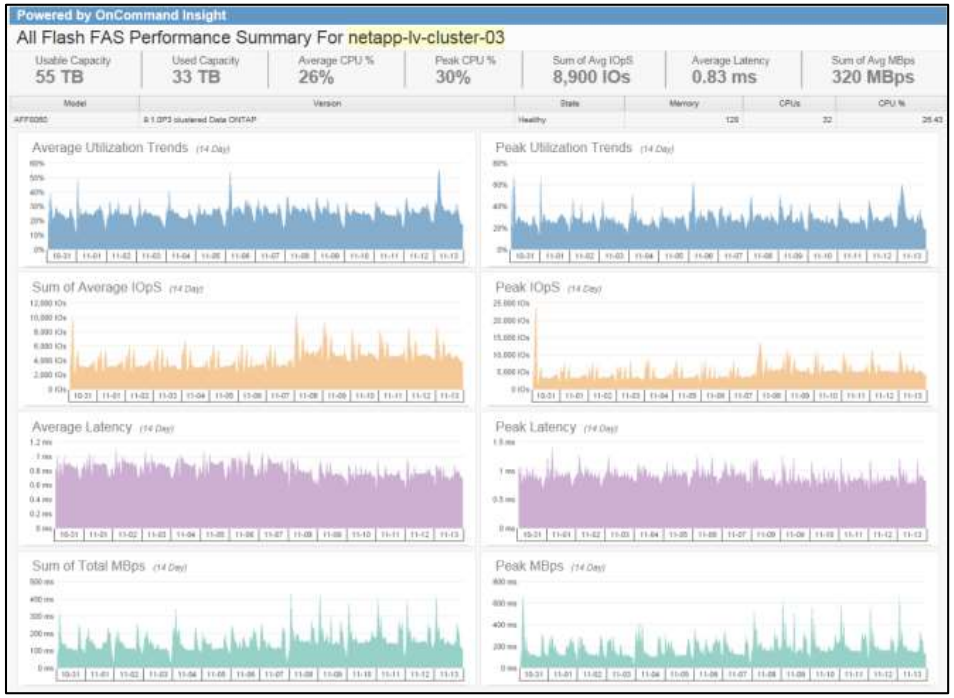
3.29 All Flash FAS Performance Summary

Description: This dashboard shows a capacity summary and performance metrics with trends for NetApp All Flash FAS arrays. A summary of capacity and performance is visible at the top of the page. Individual nodes can be selected from the drop-down list on the far right. Performance charts for IOpS, Latency, Throughput and CPU Utilization are shown with hourly data for 14 days.

Pre-Requisites: Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Node Name	Name of the NetApp node monitored by OCI.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Usable Capacity TB	Usable capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table.
Used Capacity TB	Used capacity in TB as reported by the storage pool or aggregate and contained in the Storage and Storage Pool Capacity Fact table. If Thin Provisioned, then Used = Written. If Thick Provisioned then Used = Allocated.
Average CPU %	Average CPU Utilization % as reported by the NetApp Node collected hourly for 14 days.
Peak CPU %	Peak CPU Utilization % as reported by the NetApp Node collected hourly for 14 days.
Sum of Avg IOpS	Sum of Average Protocol IOpS (e.g. NFS, CIFS, FC, iSCSCI) as reported by the NetApp Node collected hourly for 14 days.
Average Latency	Average Latency in milliseconds as reported by the NetApp Node hourly for 14 days.
Sum of Avg MBps	Sum of Average Throughput in MB/second as reported by the NetApp Node hourly for 14 days.
Peak IOpS	Peak of Protocol IOpS as reported by the NetApp Node hourly for 14 days.
Peak Latency	Peak of Latency in milliseconds as reported by the NetApp Node hourly for 14 days.
Peak MBps	Peak of Total Throughput in MB/second as reported by the NetApp Node hourly for 14 days.

Click on the report screen shot above to view an enlarged image.

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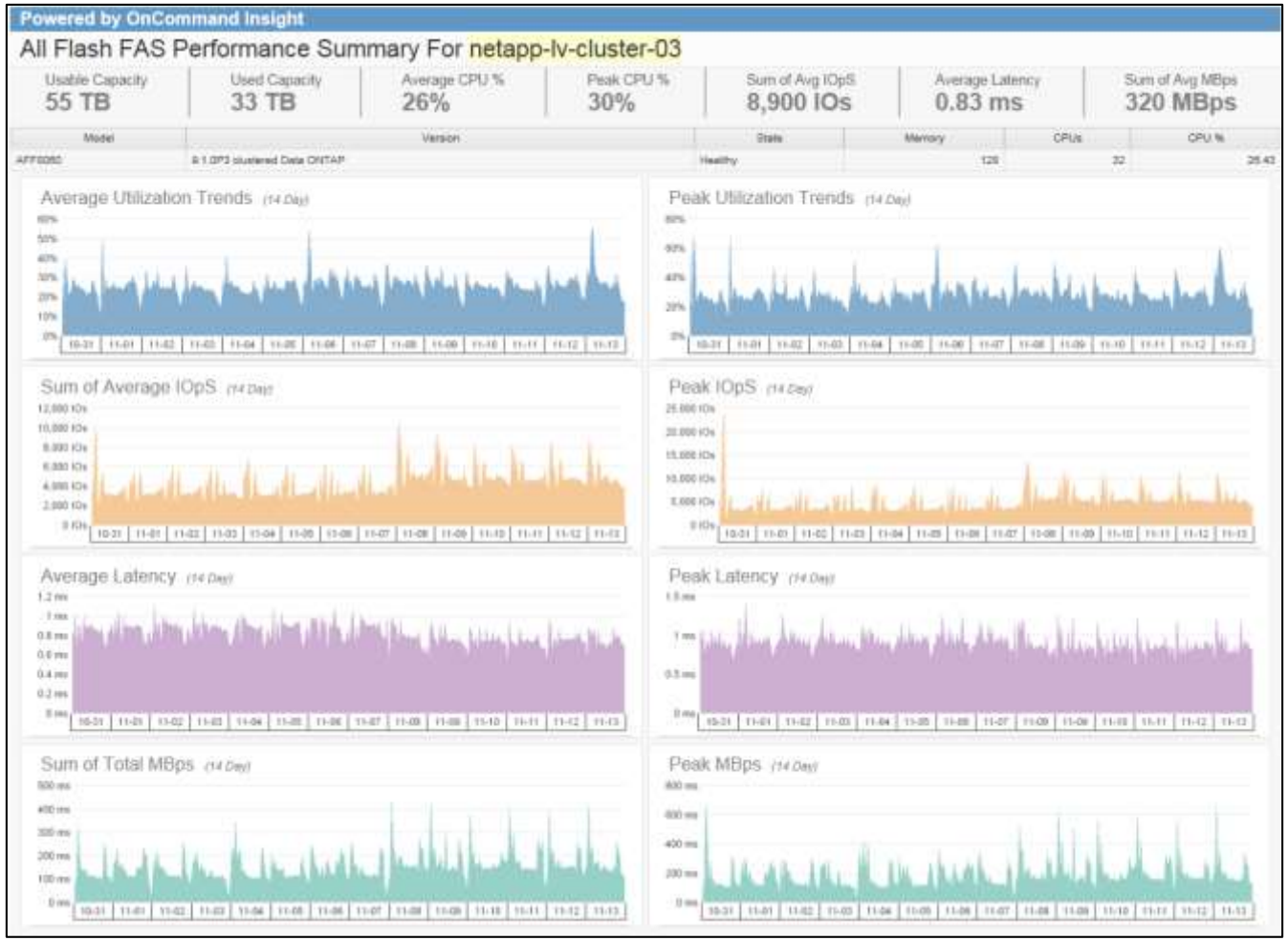
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



 Click on the screen shot above to return to the report description.

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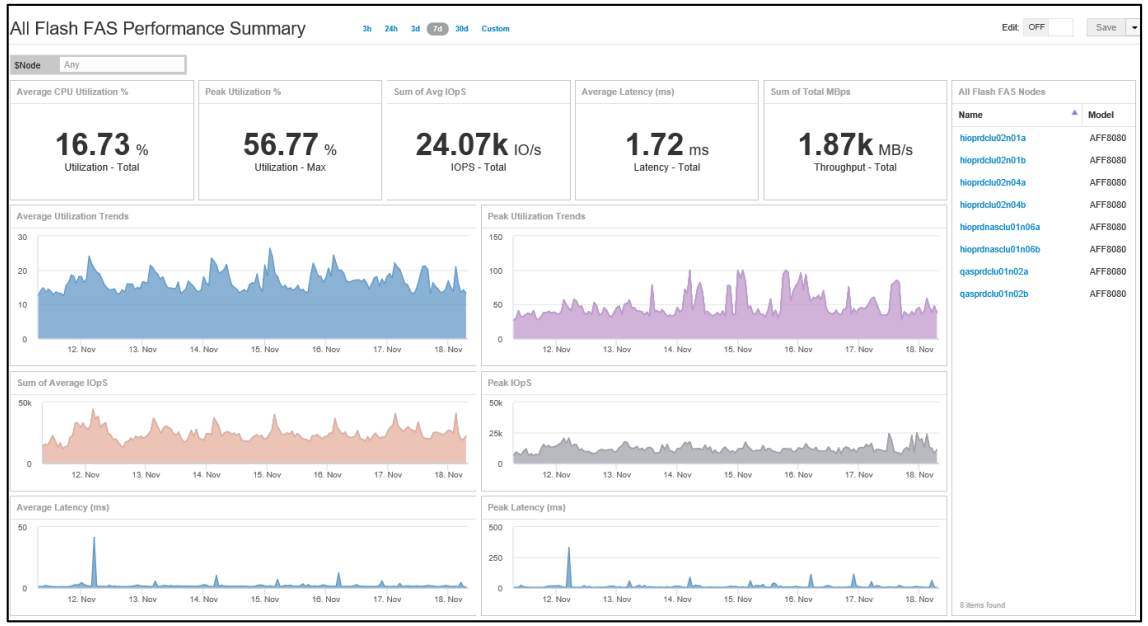
3.29 WebUI – All Flash FAS Performance Summary

Description: This WebUI based dashboard performance metrics with trends for NetApp All Flash FAS arrays. Individual nodes can be filtered using the $Node input at top left. A summary of performance metrics is visible at the top of the page. Performance charts for IOpS, Latency, and CPU Utilization are shown with a user selected time period.

Pre-Requisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Node / Name	Name of the NetApp node monitored by OCI.
Date	The date field applied to trending charts and selectable by the user.
Average CPU Utilization	Average CPU Utilization % as reported by the NetApp Node collected hourly for 14 days.
Peak CPU Utilization	Peak CPU Utilization % as reported by the NetApp Node collected hourly for 14 days.
Sum of Avg IOpS	Sum of Average Protocol IOpS (e.g. NFS, CIFS, FC, iSCSCI) as reported by the NetApp Node collected hourly for 14 days.
Average Latency	Average Latency in milliseconds as reported by the NetApp Node hourly for 14 days.
Sum of Total MBps	Sum of Average Throughput in MB/second as reported by the NetApp Node hourly for 14 days.
Peak IOpS	Peak of Protocol IOpS as reported by the NetApp Node hourly for 14 days.
Peak Latency	Peak of Latency in milliseconds as reported by the NetApp Node hourly for 14 days.

Click on the report screen shot above to view an enlarged image.

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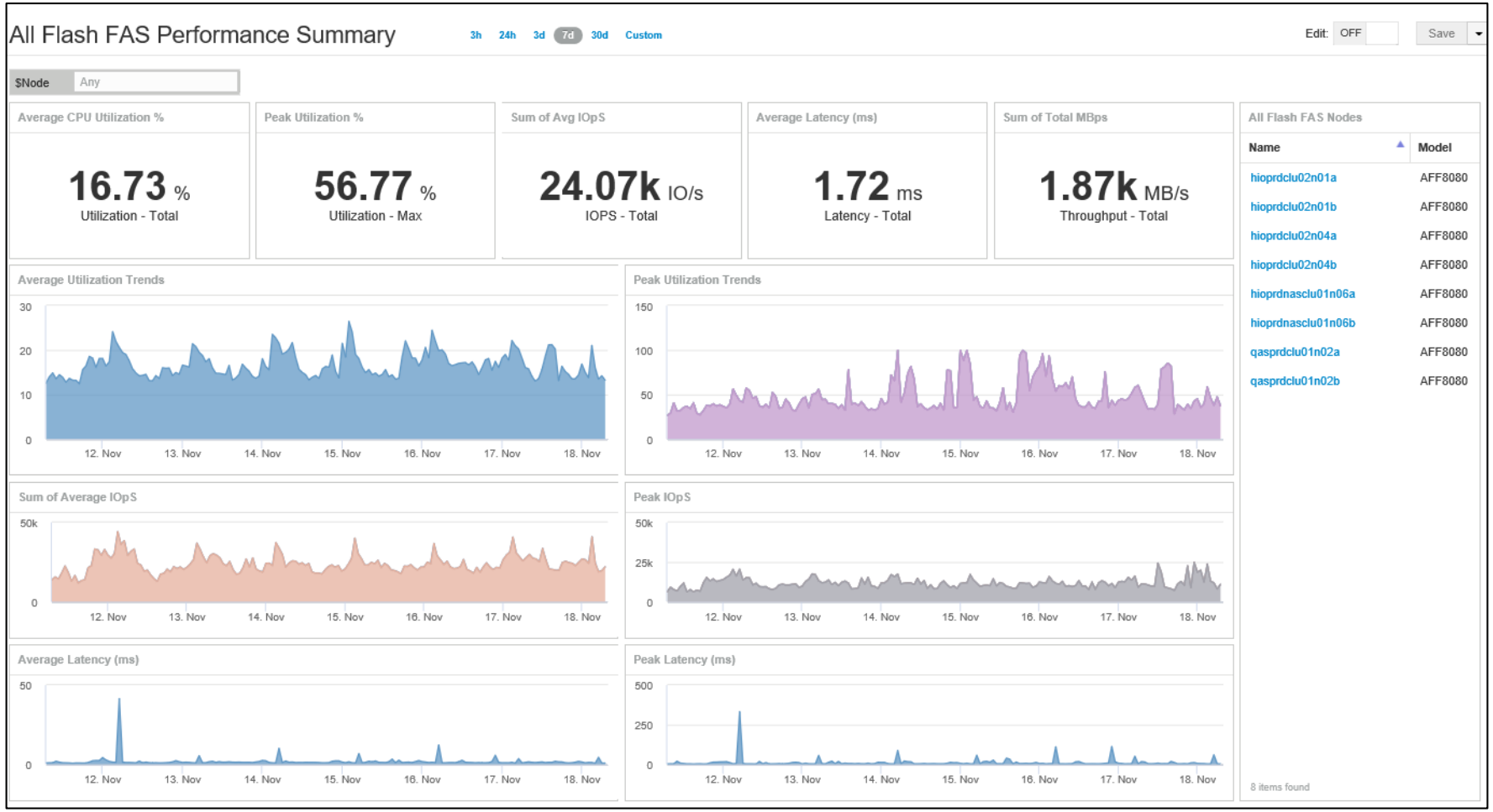
Overview	Service Level Objectives Perform. Response Time	WebUI – Service Level Performance Objectives	Storage Performance Trends	WebUI – Storage Performance Trends	Peak Performance Trends	WebUI – Peak Performance Trends	IO Density with Date and Time Prompts	Capacity and Performance – Virtual Machines	WebUI – Capacity and Performance – VMs
Top 10 and Bottom 10 Apps by Performance	WebUI – Top 10 and Bottom 10 Apps by Perf	NetApp Node Performance by Protocol	NA Node Performance w/ SLA-SLO Thresholds	WebUI – Performance by Node	SAN Switch – Slow Drain Analysis	WebUI – Slow Drain Devices	QoS Policy and Status	Storage at Rest	WebUI – Storage at Rest
Switch Port Performance	Storage Port Distribution	Performance by Array	WebUI – Performance by Array	Potential Resource Contention – NetApp	Potential Resource Contention – SAN	Exchange Dashboard	WebUI – Exchange Dashboard	WebUI – Quality Assured Performance Tier Status	NetApp Volume Latency
WebUI – NetApp Volume Latency	Application Capacity and Performance	WebUI - NetApp Disk Performance	SLA Latency Exceptions	Latency by Site and Tier	WebUI – Orphaned Vols – Storage at Rest	Flash Pool and Flash Cache Analytics	WebUI – ESX Environment Performance	All Flash FAS Performance Summary	WebUI – All Flash FAS Performance Summary



Click on the screen shot above to return to the report description.

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Demand Management Overview

These are some of the day-to-day and monthly demand management tasks that can be addressed by leveraging the reports in this catalog. Here are some of the objectives met by this section:

- Application Service Level Management
- Performance Availability
- Capacity and Performance Planning
- Workload Characterization Review
- Demand Profile Reporting

* Any modifications to the Data Dictionary for the reports shown will require a custom report.

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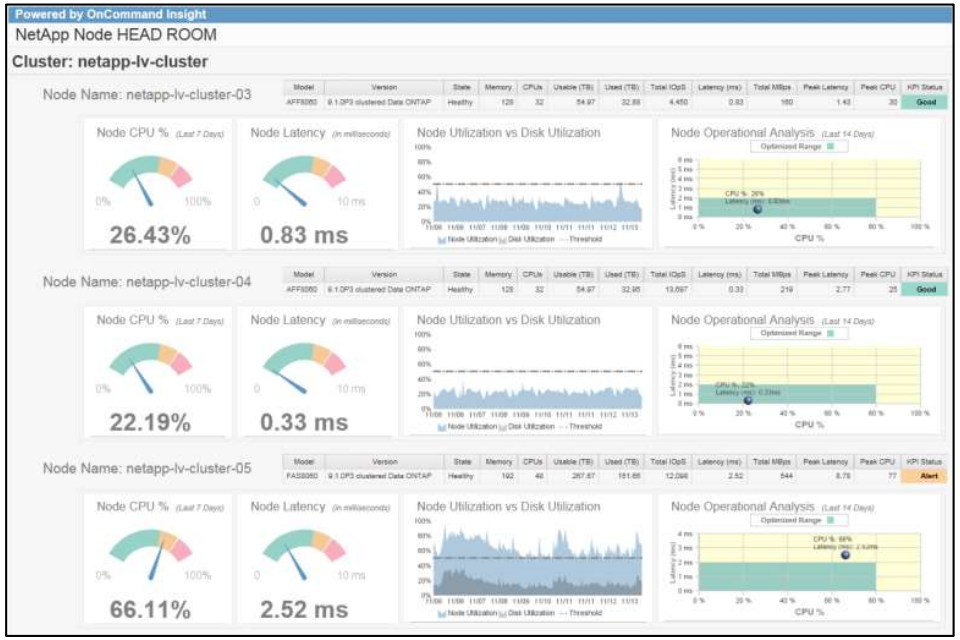
4.1 NetApp Node Head Room

Description: This dashboard shows the amount of head room (available performance) for each individual NetApp node grouped by Cluster. The objective is to isolate Node CPU % and Node Latency then provide a comparison of Node CPU % vs Disk Utilization %. Node operational analysis appears in the form of a bubble chart comparing CPU % with Latency (ms) with a threshold of 2ms latency and 80% CPU utilization. Nodes that fall outside of the range (green) will have reduced available performance. A summary for each node is available above the charts with a KPI Status.

Prerequisites: This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field`	Description
Cluster	Name of the NetApp Cluster (CDOT or 7-Mode) monitored by OCI.
Node	Name of the Node or HA Pair associated with the Cluster.
Model	Name of the Model associated with the NetApp Node.
Version	ONTAP version for the NetApp Node.
State	State of the NetApp Node (e.g. Healthy, Degraded).
Memory	Amount of memory installed in the NetApp Node.
CPUs	Number of CPUs installed in the NetApp Node.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Usable (TB)	Usable capacity in TB as reported by the storage pools associated with the storage node and contained in the dwh_inventory.storage_pool table
Used (TB)	Used capacity in TB as reported by the storage pools associated with the storage node and contained in the dwh_inventory.storage_pool table.
Total IOpS	Sum of Average Protocol IOpS (e.g. NFS, CIFS, FC, iSCSCI) as reported by the NetApp Node collected hourly for 7 days.
Node CPU %	Average CPU Utilization % as reported by the NetApp Node collected hourly for 7 days.
Latency (ms)	Average Latency in milliseconds as reported by the NetApp Node hourly for 7 days.
Total MBps	Sum of Average Throughput in MB/second as reported by the NetApp Node hourly for 7 days.
Peak Latency	Peak of Protocol IOpS as reported by the NetApp Node hourly for 14 days.
Peak CPU	Peak CPU Utilization % as reported by the NetApp Node collected hourly for 7 days.
KPI Status	WHEN CPU % <=50 AND Latency <=2 THEN 'Good' WHEN CPU % between 50 and 80 AND Latency <=2 THEN 'Watching' WHEN CPU % <=50 AND Latency <2 THEN 'Watching' WHEN CPU % between 50 and 80 AND Latency >2 THEN 'Alert' WHEN CPU % > 80 AND Latency >2 THEN 'Warning'

Click on the report screen shot above to view an enlarged image.

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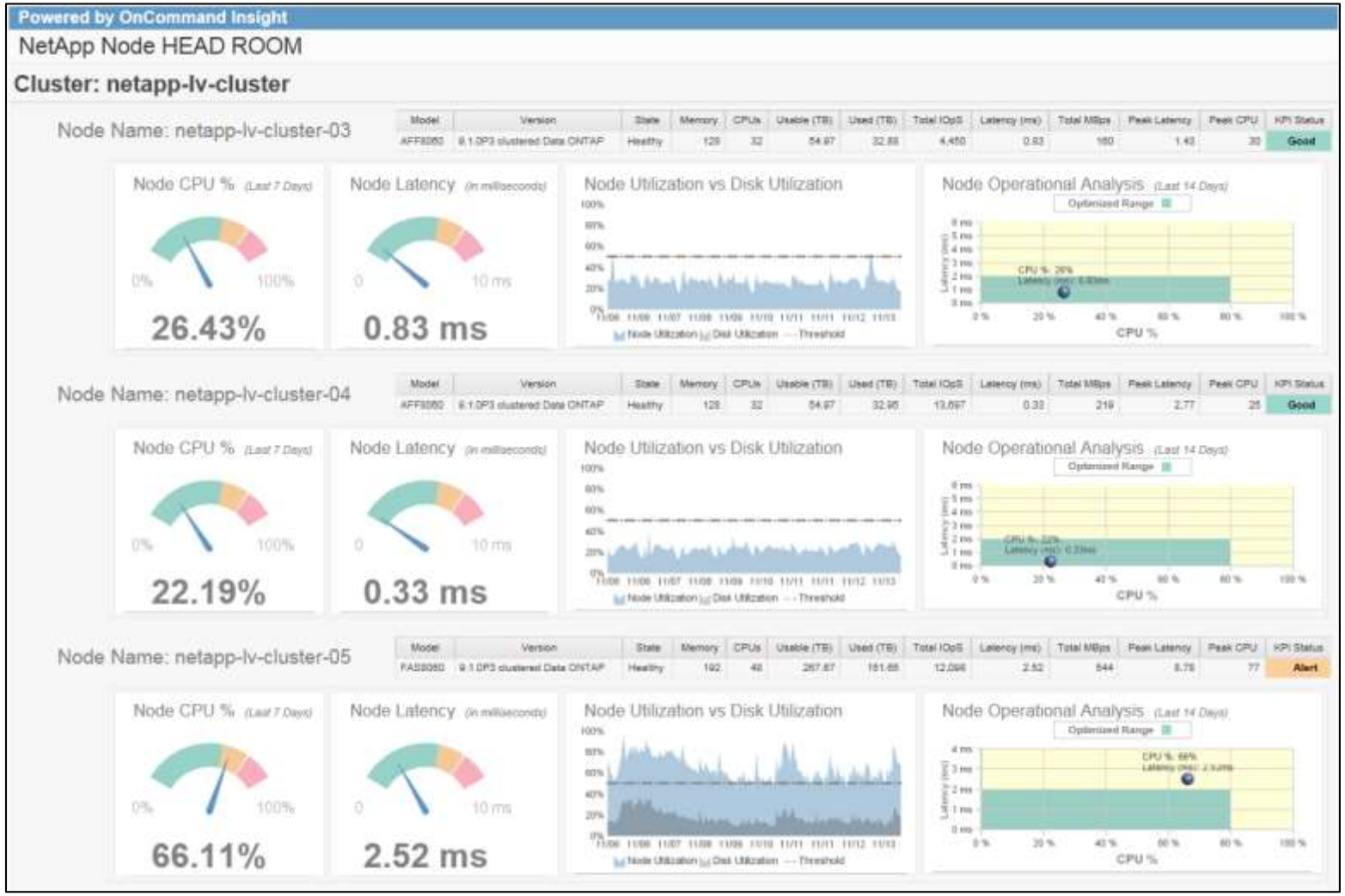

Click on the screen shot above to return to the report description.

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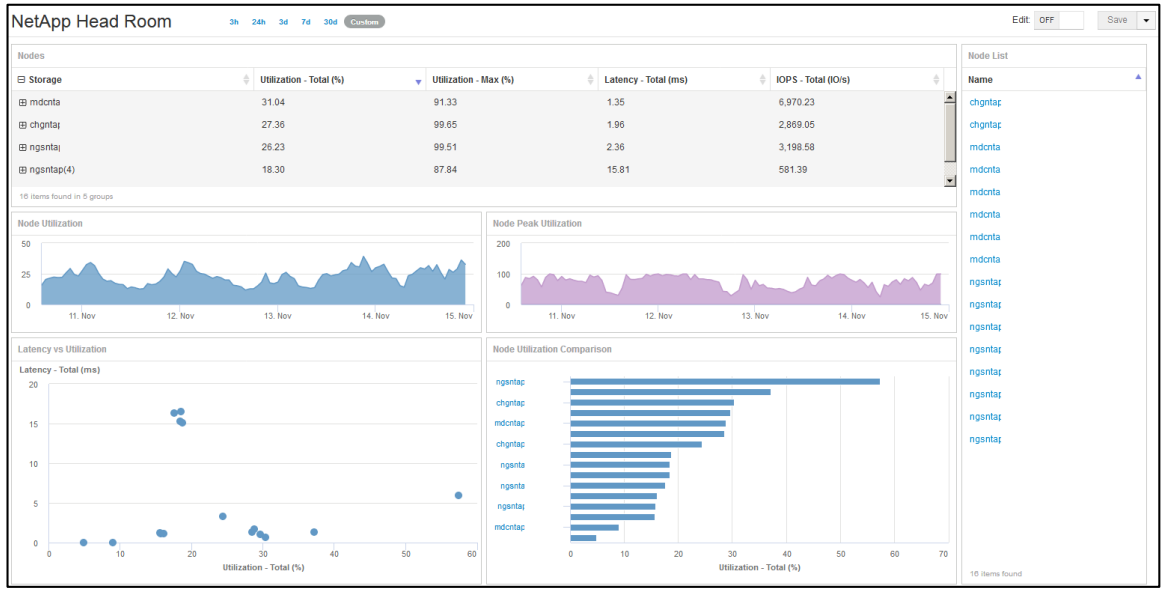
4.1 WebUI – NetApp Head Room

Description: This WebUI based dashboard tracks Head Room or Available Performance for NetApp Nodes. A list of Nodes is available on the right with drill down capability. On the top left, a detailed list of Nodes with performance metrics show CPU Utilization, Latency and IOPS. Total refers to both Read and Write for all metrics. Max refers to Peak for the user selected time period. Trends for CPU and Peak CPU % are shown in the middle and a bubble chart comparing Latency with CPU % is at bottom left with a top to bottom Node utilization chart at bottom right.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage / Name	Name of the Node monitored by OCI.
Date	The date field applied to trending charts and selectable by the user.
Utilization – Total (%)	Average CPU Utilization % as reported by the NetApp Node for the user selected time period.
Utilization – Max (%)	Peak CPU Utilization % as reported by the NetApp Node for the user selected time period.
Latency – Total (ms)	Average Latency in milliseconds as reported by the NetApp Node for the user selected time period.
IOPS – Total (IO/s)	Sum of Average Protocol IOpS (e.g. NFS, CIFS, FC, iSCSCI) as reported by the NetApp Node for the user selected time period.

Click on the report screen shot above to view an enlarged image.

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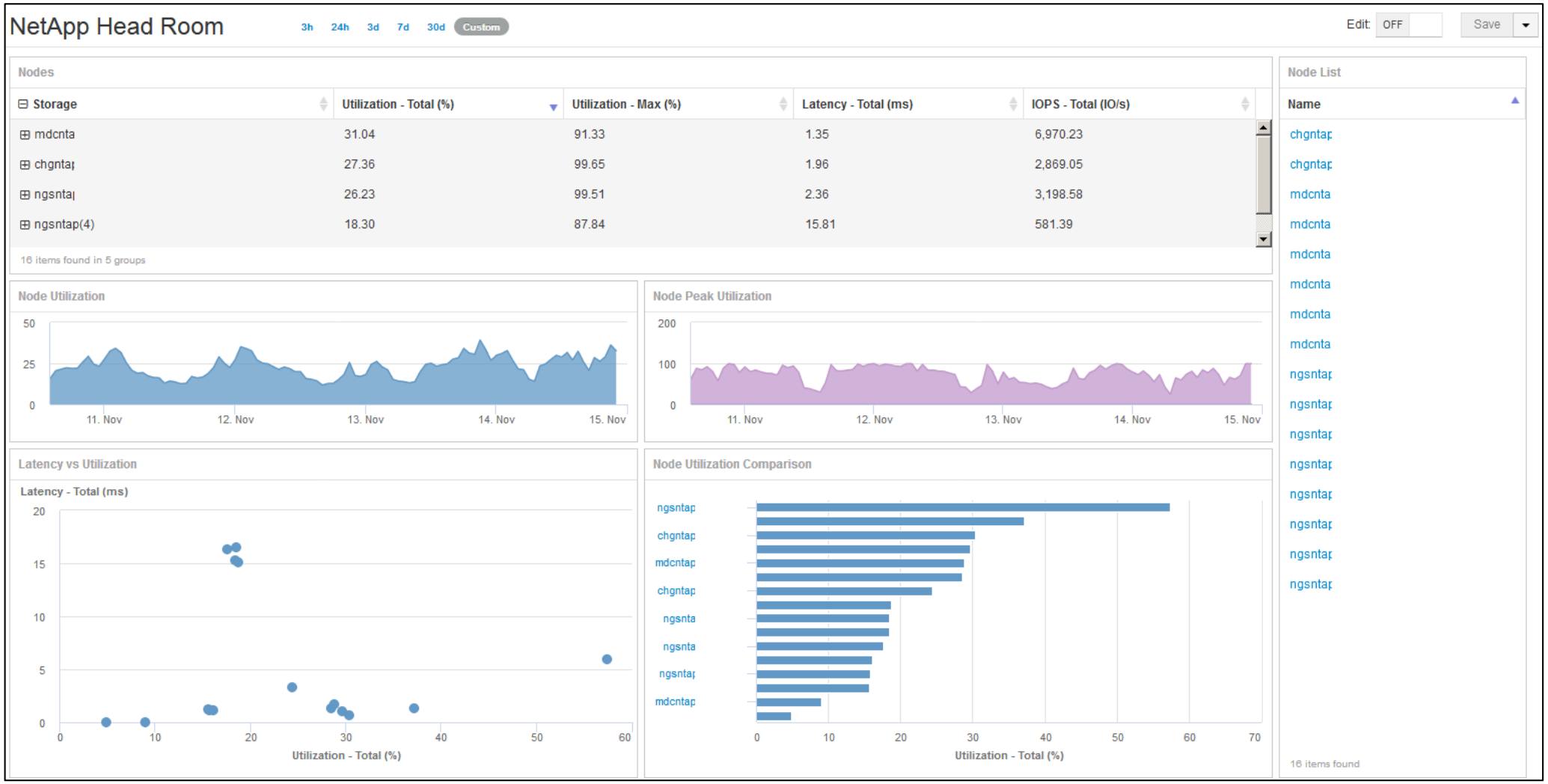

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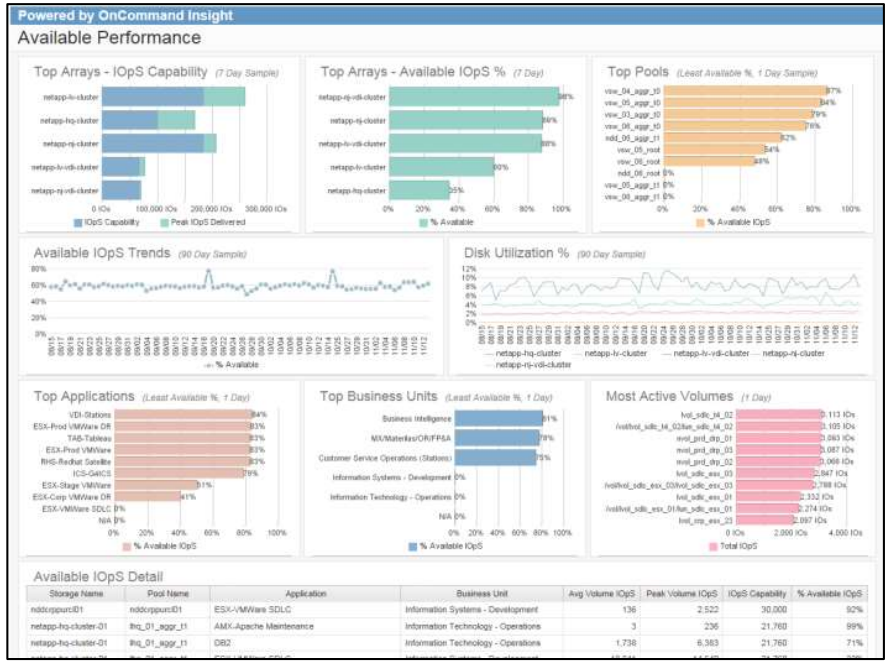
4.2 Available Performance

Description: This dashboard reports on Available Performance. Top Available Performance by Array and by Storage Pool are in the first two charts. On the right side are charts showing Available Performance by Business Unit and Application. The middle section shows Peak IOpS Delivered as contrasted to Peak IOpS Capability. The bottom section displays a detailed list of Available IOpS by Storage, Application and Business Unit.

Prerequisites: Annotations/definitions are necessary for Application and Business Unit. Requires secondary ETL script to run nightly. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the storage array (or filer) discovered by OCI.
Pool Name	Name of the storage pool or aggregate associated with the storage array (or filer) discovered by OCI.
Application	OCI configured annotation. Defines the application with host or internal volume capacity.
Business Unit	OCI configured annotation. Defines the Business Unit or Line of Business (depending on config) with host or internal volume capacity.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Avg Volume IOpS	Sum of Average Volume IOpS reported by the volumes associated with the storage device and collected daily for 90 days.
Peak Volume IOpS	Peak Volume IOpS reported by the volumes associated with the storage device and collected daily for 90 days.
IOpS Capability	IOpS Capability of the Storage Pool as published by the drive manufacturer. Example: a 15K SAS drive supports 200 IOpS.
Available IOpS	IOpS Capability – Peak Volume IOpS.
% Available IOpS	Peak Volume IOpS / IOpS Capability.
Disk Utilization	Average Disk Utilization % reported by the disks that support the storage pools or aggregates for the user selected time period.

Click on the report screen shot above to view an enlarged image.

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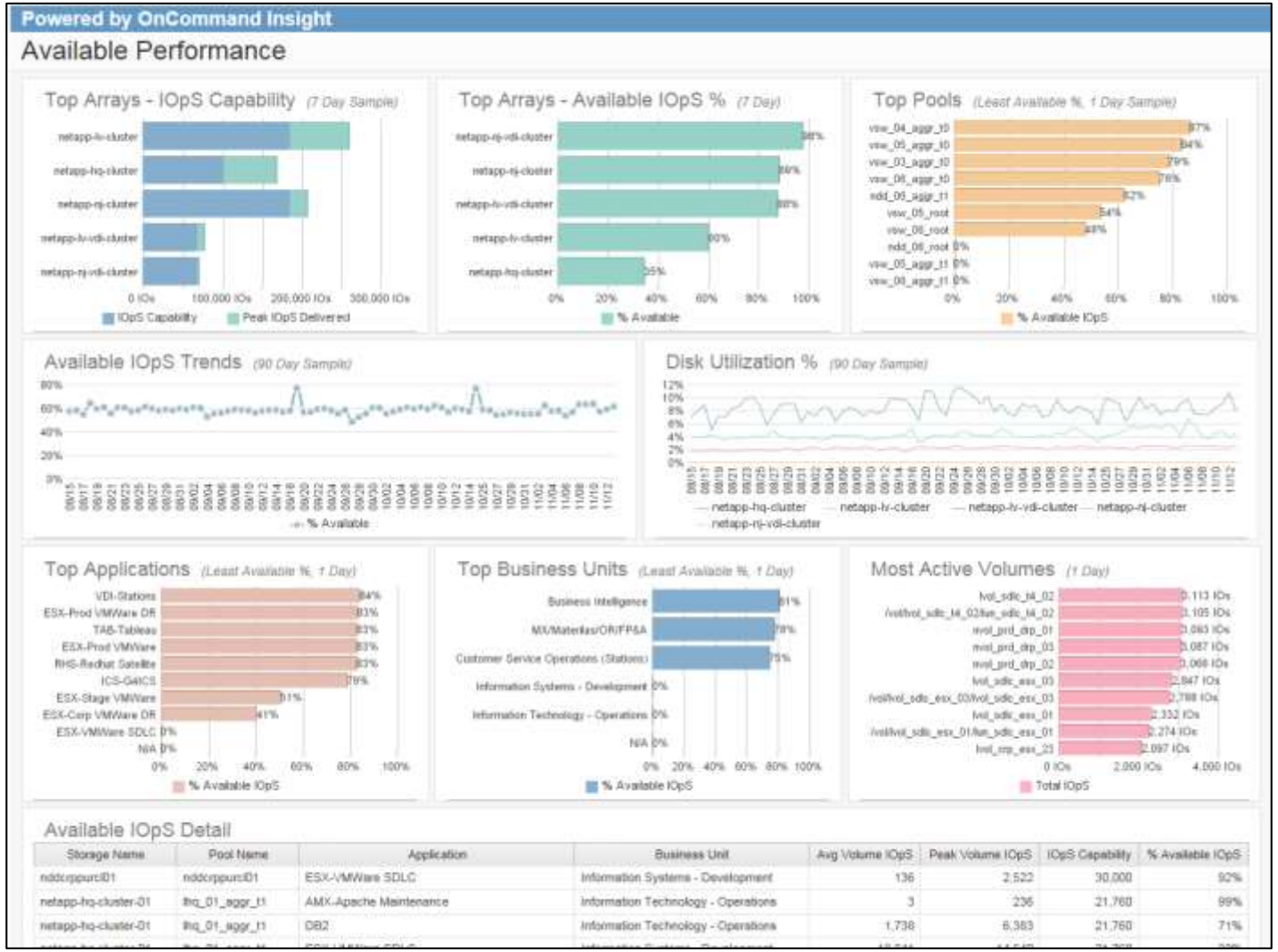

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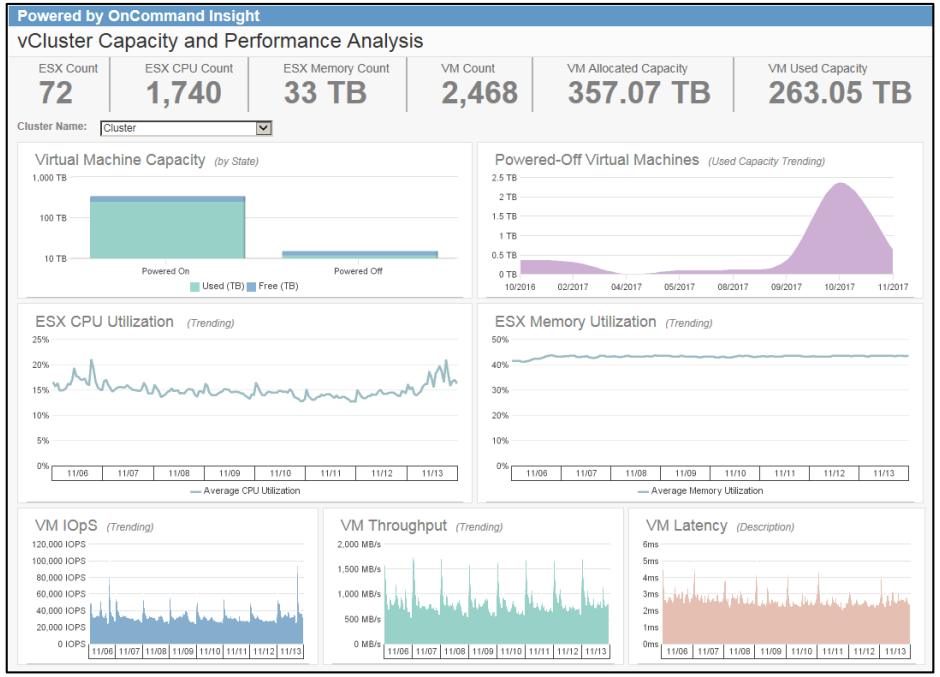
4.3 vCluster Capacity Performance Analysis

Description: This dashboard depicts the overall virtual infrastructure with a pulldown to display a specific Cluster. It provides overall ESX Count; ESX CPU Count; ESX Memory; overall VM Count; VM Allocated Capacity; and VM Used Capacity. The middle section shows VM Capacity by State; VM Used Capacity Trending; ESX CPU Utilization Trending; and ESX Memory Utilization Trending. The bottom section shows VM IOpS Trending; VM Throughput Trending; and VM Latency Trending.

Prerequisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
ESX Count	Number of ESX servers estate wide.
ESX CPU Count	Number of CPU's associated with ESX servers estate wide.
ESX Memory Count	Total amount of RAM memory in TB associated with ESX servers estate wide.
VM Count	Total number of VMs in the estate.
VM Allocated Capacity TB	Capacity that is provisioned to virtual guests in TB.
VM Used Capacity TB	VM Used Storage shows the space actually occupied by the virtual machine files (Config Files, Log files, VMDK & Snapshots, etc.) in the Virtual Machine Directory. Value of the used storage will be changed or little more when the virtual machine is powered on because Swap files will be created in the virtual machine directory and disappeared, when VM is powered down.
Used (TB)	Used capacity in TB. If thick provisioned, then used is equal to provisioned or allocated.
Free (TB)	VM Allocated Capacity TB – VM Used Capacity TB
ESX CPU Utilization %	CPU Utilization % of the ESX host as reported by the virtual center client API.
ESX Memory Utilization %	Memory Utilization % of the ESX host as reported by the virtual center client API.
VM IOpS	Total IOpS (both read and write) of the virtual guest as reported by the data store and averaged hourly for past 7 days.
VM Throughput	Total Throughput in MB/second (both read and write) of the virtual guest as reported by the data store and averaged hourly for past 7 days.
VM Latency	Total Response Time in milliseconds (both read and write) of the virtual guest as reported by the data store and averaged hourly for past 7 days.
State	State of the virtual guest, e.g. Powered-on, Powered-off, Suspended.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.

Click on the report screen shot above to view an enlarged image.

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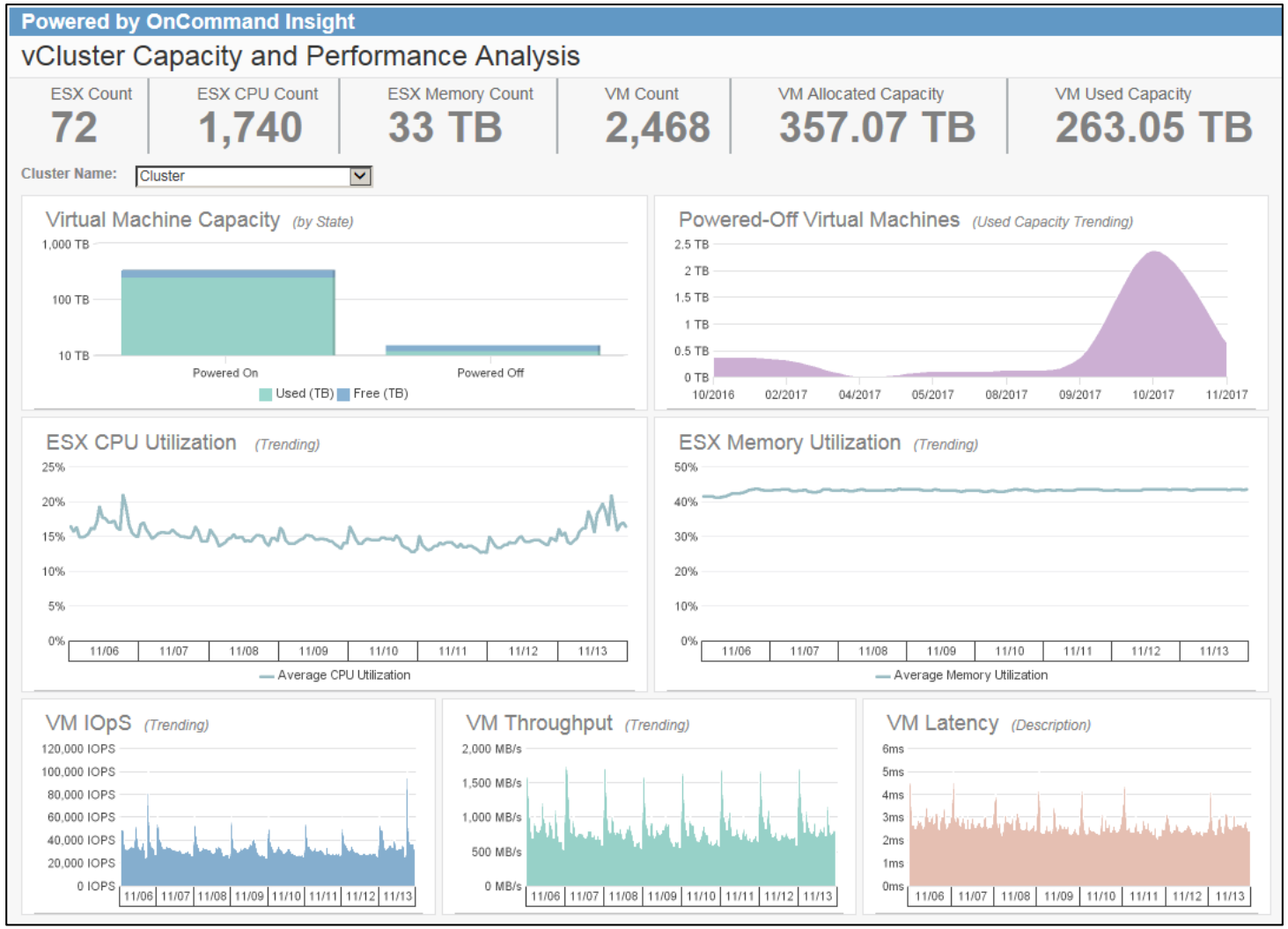

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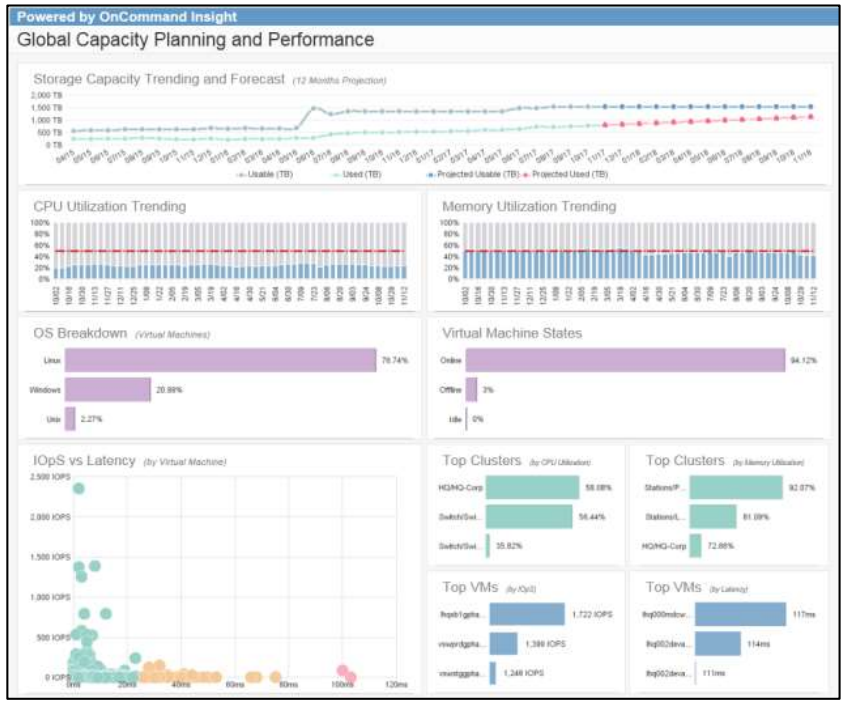
4.4 Global Capacity Planning and Performance

Description: This dashboard shows Global Capacity and Performance in order to plan. On the top are trending reports for Storage Capacity; VM CPU and Memory Utilization; a breakdown by OS; and Virtual Machine States. On the bottom are additional charts displaying IOPS vs Latency (by VM) and to the right of that Top VM's by various metrics (CPU, Memory, IOpS, & Latency).

Prerequisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
ESX Host / vCluster	Name of the ESX Host/Server monitored by OCI.
Virtual Machine Name	Name of the VM Guest associated with the ESX Host monitored by OCI.
Capacity (TB)	Capacity allocated for a storage pool as reported by the storage array in TB.
Used Capacity (TB)	If thick provisioned, it is capacity that is visible to hosts. If thin provisioned, it is capacity that is written in TB.
Projected Capacity (TB)	Forecast Capacity (TB) as reported by the storage pool and calculated via linear regression formula.
Projected Used Capacity (TB)	Forecast Used Capacity (TB) as reported by the storage pool and calculated via linear regression formula.
ESX CPU Utilization %	CPU Utilization % of the ESX host as reported by the virtual center client API.
ESX Memory Utilization %	Memory Utilization % of the ESX host as reported by the virtual center client API.
Virtual Machine State	State of the virtual guest. E.g. online, offline, idle.
OS Breakdown	Percent of virtual guests by operating system.
VM IOpS	Total IOpS (both read and write) of the virtual guest as reported by the data store and averaged hourly for past 7 days.
VM Latency	Total Response Time in milliseconds (both read and write) of the virtual guest as reported by the data store and averaged hourly for past 7 days.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.

Click on the report screen shot above to view an enlarged image.

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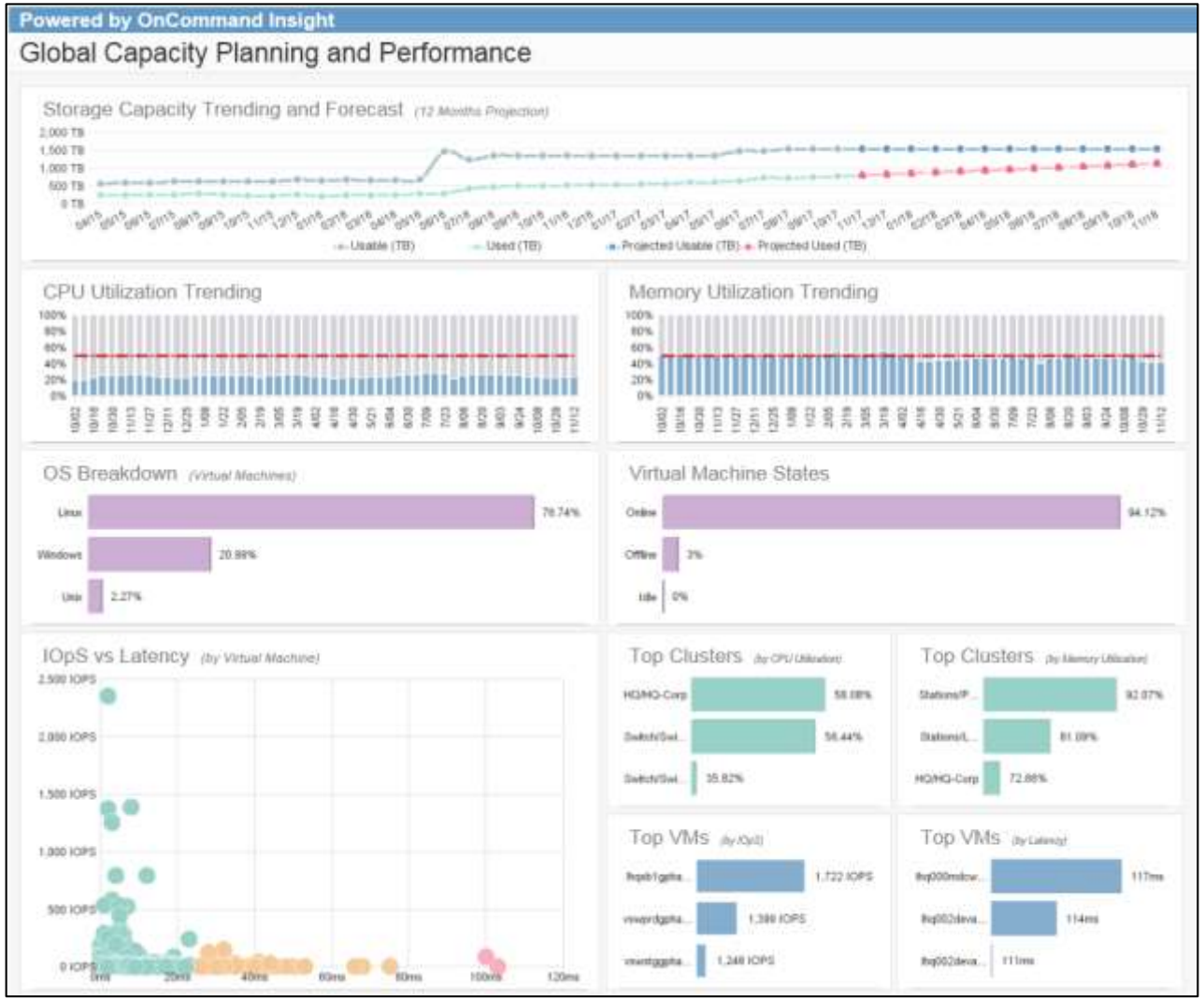

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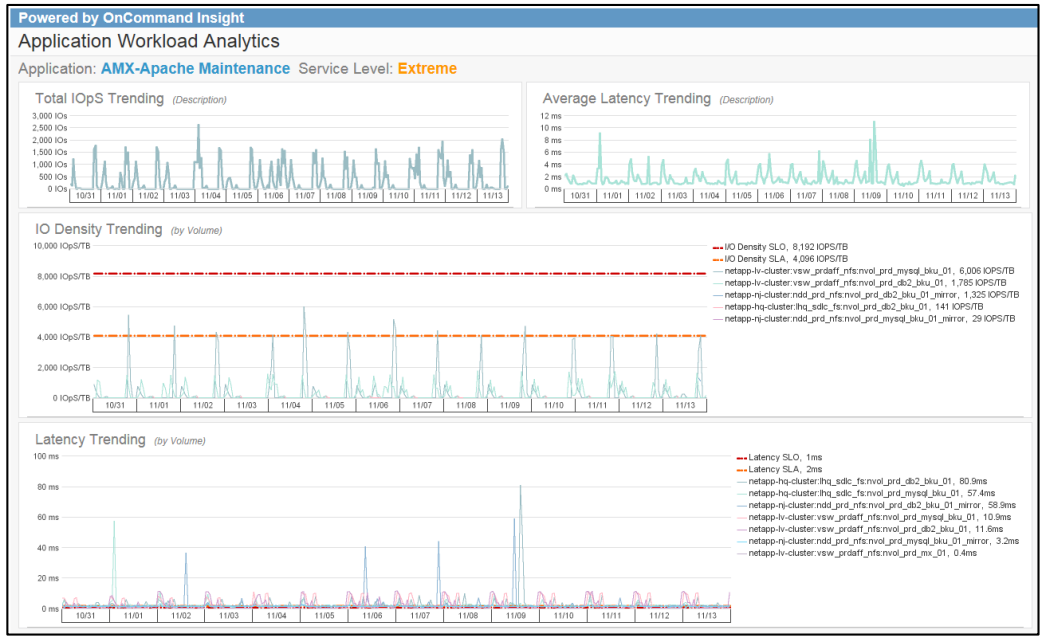
4.5 Application Workload Analytics

Description: This interactive report enables the user to select an Application and Service Level to show IOpS and Latency Trending, I/O Density Trending by Volume and Latency Trending by Volume with SLO/SLA's based on the selected Service Level. Service Levels are NOT OCI annotations. They are pre-programmed with values in the report SQL and are defined below.

Prerequisites: Annotations/definitions are necessary for Application. Requires secondary ETL script to run nightly. There is a Non-ETL version as well. This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	Data Center location annotation configured in OCI and assigned to the Storage Device.
Application	OCI configured annotation. Defines the application with host or internal volume capacity.
Volume Name	Name of the volume or internal volume associated with the storage device monitored by OCI.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Avg IOpS	Average Volume IOpS reported by the volume associated with the application and collected hourly for 14 days.
Avg Latency	Average Volume Latency in milliseconds reported by the volume associated with the application and collected hourly for 14 days.
IOpS / TB	IO Density or Average IOpS per TB of capacity range. Based on IOpS/TB –Service Level DEFAULTS are defined as follows: • Capacity = IOpS/TB < 128 • Value = IOpS/TB < 512 • Performance = IOpS/TB < 1024 • High Read = IOpS/TB < 2048 • High Write = IOpS/TB < 4096 • Extreme = IOpS/TB > 4096

Click on the report screen shot above to view an enlarged image.

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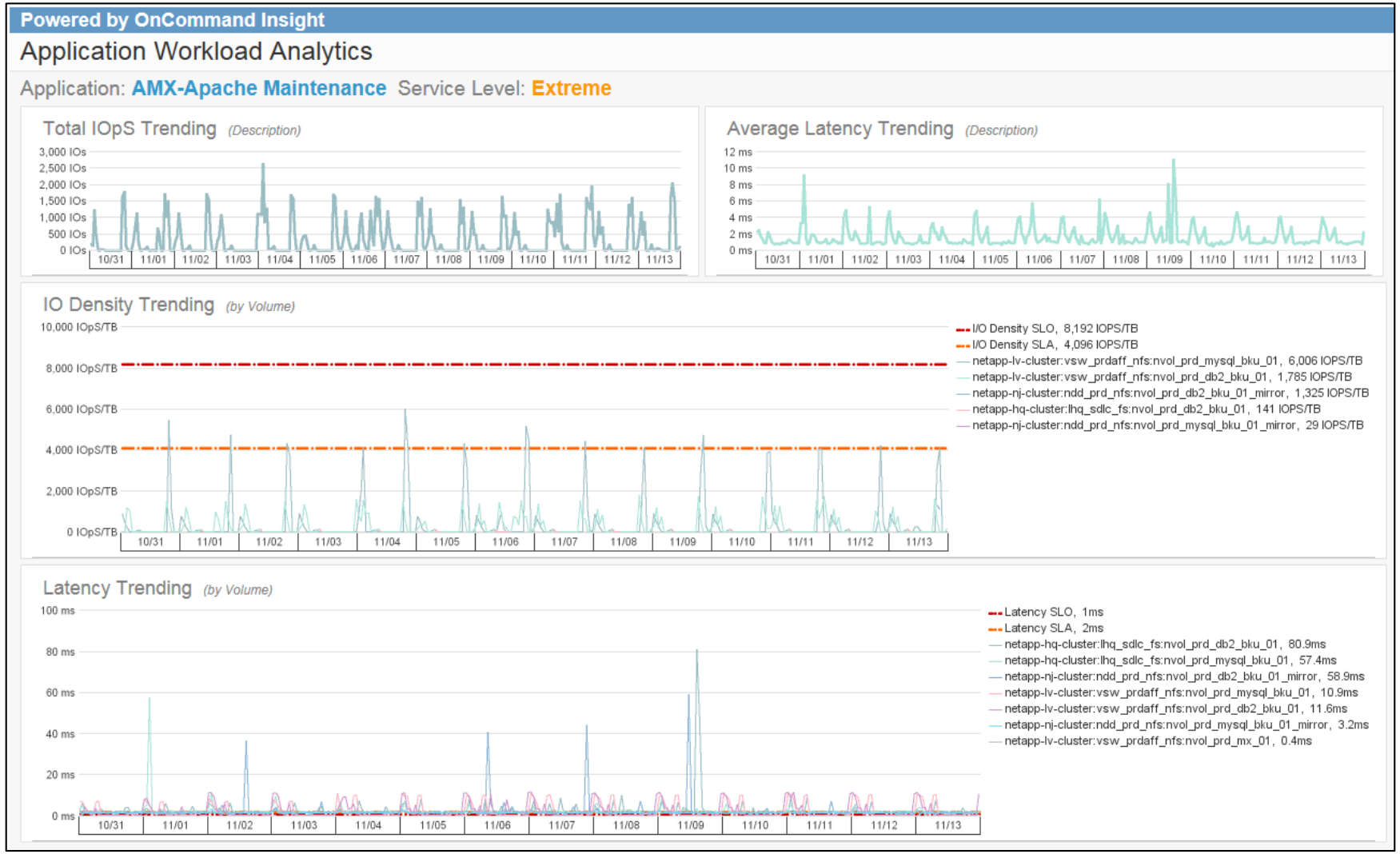

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4.5 WebUI – Application Workload Analytics

Description: This WebUI based dashboard tracks Application by Service Level to show IOpS and Latency Trending, I/O Density Trending by Volume and Latency Trending by Volume. A list of applications is available on the right with drill-down capability. Individual applications or service levels can be filtered at the top left.

Prerequisites: Annotations/definitions are necessary Application and Service Level/Tier. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
$application	Dashboard variable used to filter the report for individual applications.
$serviceLevel	Dashboard variable used to filter the report for individual service levels.
Application	OCI configured annotation. Defines the application with host or internal volume capacity.
Service Level	IO Density or Average IOpS per TB of capacity range. Based on IOpS/TB –Service Level DEFAULTS are defined as follows: • Capacity = IOpS/TB < 128 • Value = IOpS/TB < 512 • Performance = IOpS/TB < 1024 • High Read = IOpS/TB < 2048 • High Write = IOpS/TB < 4096 • Extreme = IOpS/TB > 4096
Volume	Name of the volume or internal volume associated with the storage device monitored by OCI.
Date	The date field applied to trending charts and selectable by the user.
Avg IOpS	Average Volume IOpS reported by the volume associated with the application for the user selected time period.
Avg Latency	Average Volume Latency in milliseconds reported by the volume associated with the application for the user selected time period.
IO Density	Average IOpS / TB of capacity for the user selected time period.

Click on the report screen shot above to view an enlarged image.

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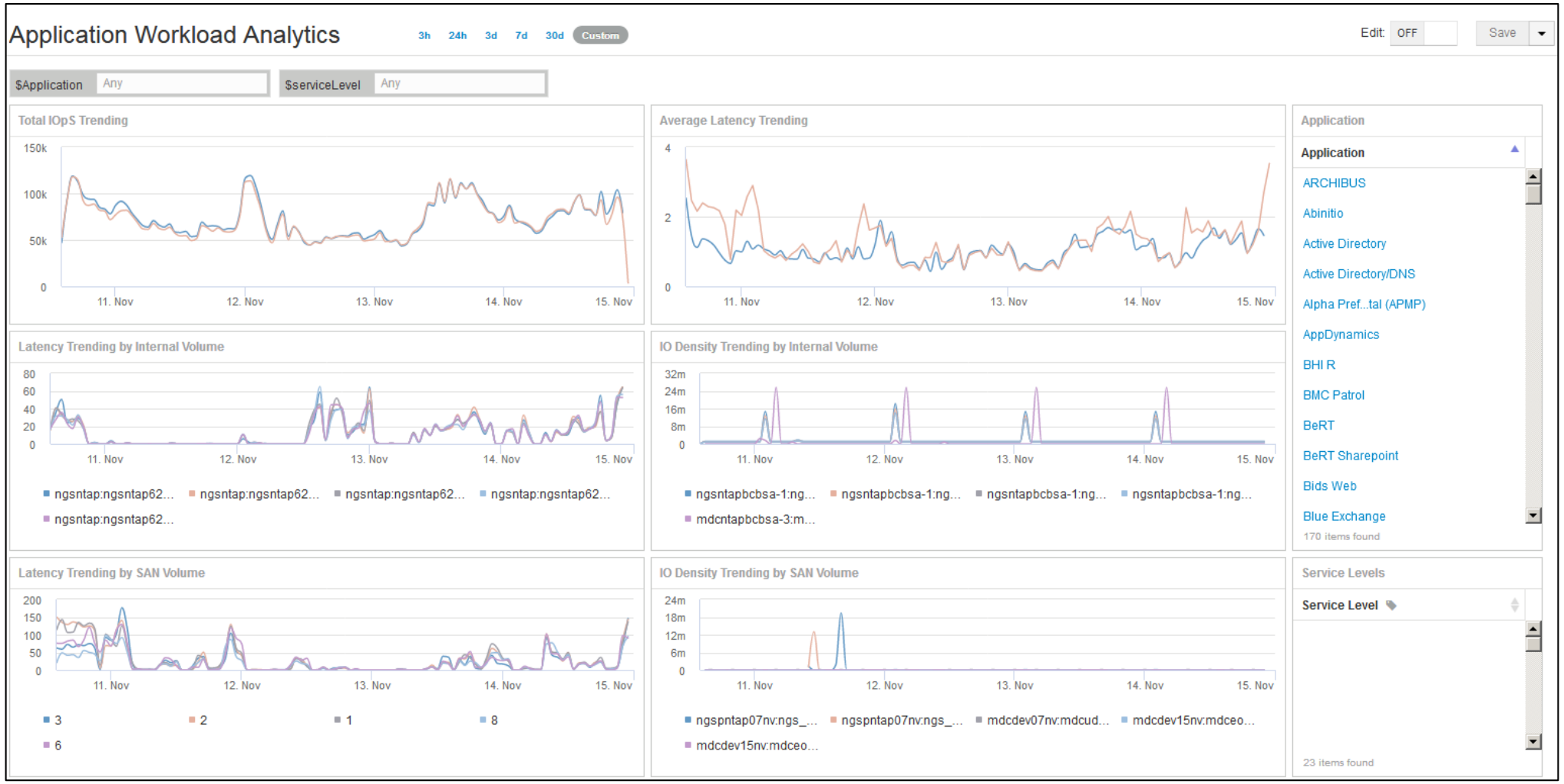

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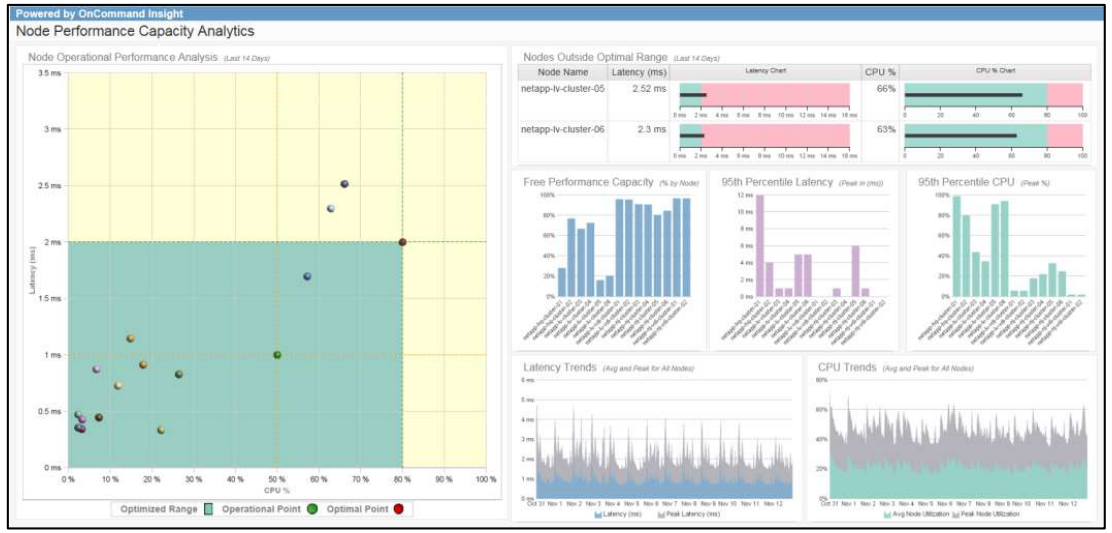
4.6 Node Performance Capacity Analytics

Description: This dashboard shows the state of NetApp Node Performance Capacity. Its similar to a Head Room report showing Latency vs CPU % and specific nodes that fall out of the optimized range (green). Nodes outside the optimized range are featured at the top right. Free performance capacity by node, 95th percentile latency and 95th percentile CPU % are graphed for each node. Latency and CPU trends are visible at bottom right.

Prerequisites: This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Node Name	Name of the NetApp Node monitored by OCI.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Latency (ms)	Average Latency in milliseconds as reported by the NetApp Node hourly for 14 days.
Peak Latency	Peak Latency in milliseconds as reported by the NetApp Node hourly for 7 days.
CPU %	Average CPU Utilization % as reported by the NetApp Node collected hourly for 14 days.
Free Performance Capacity	Latency (ms) / CPU % / 82 (82 is equal to 80% CPU + 2 ms latency).
95th Percentile Latency	Indicates that Peak Latency is no more than 95% of peak over the hourly collection period for 14 days.
95th Percentile CPU %	Indicates that Peak CPU % is no more than 95% of peak over the hourly collection period for 14 days.
Node Utilization	Same as CPU %.
Peak Utilization	Peak CPU Utilization % as reported by the NetApp Node collected hourly for 14 days.

Click on the report screen shot above to view an enlarged image.

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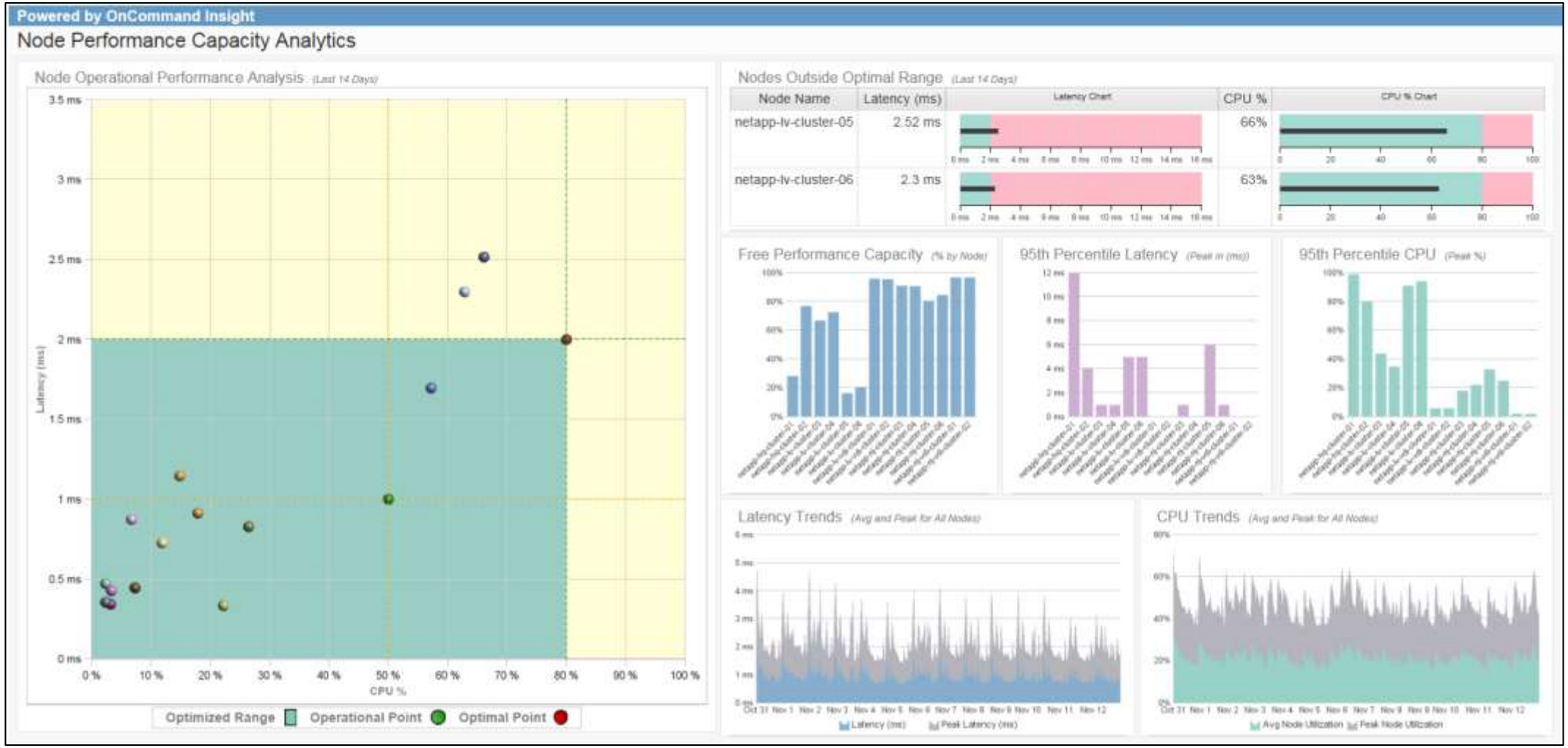

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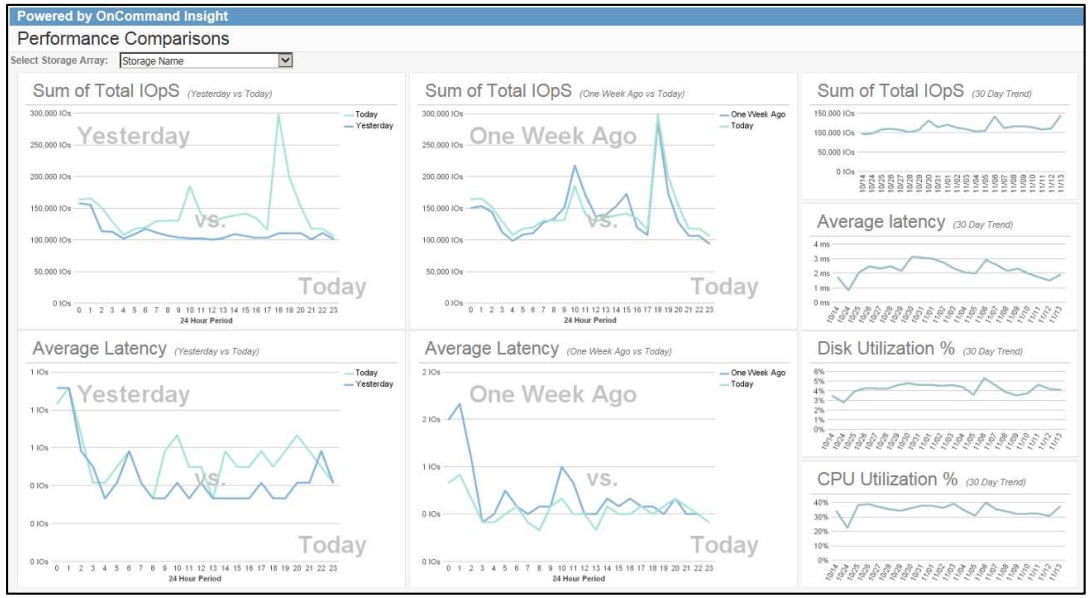
4.7 Performance Comparisons

Description: This dashboard shows performance comparisons between yesterday's data and today's. Additionally, there are parallel charts that show the difference between one week ago and today. 30-day trend charts are shown on the right. A drop-down is available for users to select individual storage devices for filtering.

Prerequisites: This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Name	Name of the storage array (or filer) discovered by OCI.
Date	Hour, and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Sum of Total IOpS	Sum of Average IOpS reported by volumes associated the storage device. The time period varies between charts. Hourly metrics (24 hours) are used for comparisons. Daily metrics are used for trending over 30 days.
Average Latency	Latency in milliseconds reported by volumes associated with the storage device. The time period varies between charts. Hourly metrics (24 hours) are used for comparisons. Daily metrics are used for trending over 30 days.
Disk Utilization %	Average Disk Utilization % reported by the disks that support the storage pools or aggregates daily for 30 days.
CPU Utilization %	Average CPU Utilization % as reported by the Node daily for 30 days. For Symmetrix Arrays, this will be FA Port Utilization.

Click on the report screen shot above to view an enlarged image.

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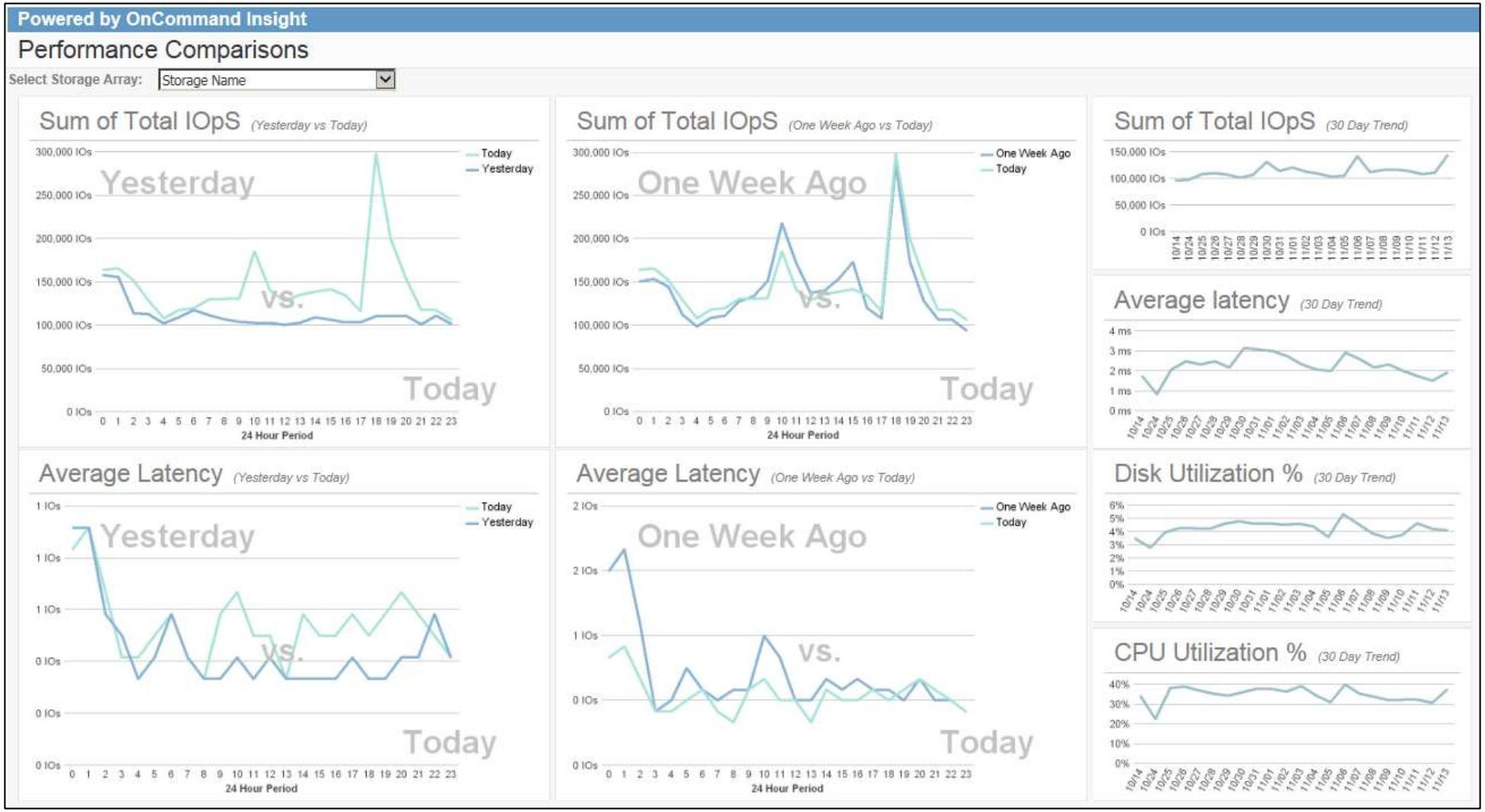

Click on the screen shot above to return to the report description.

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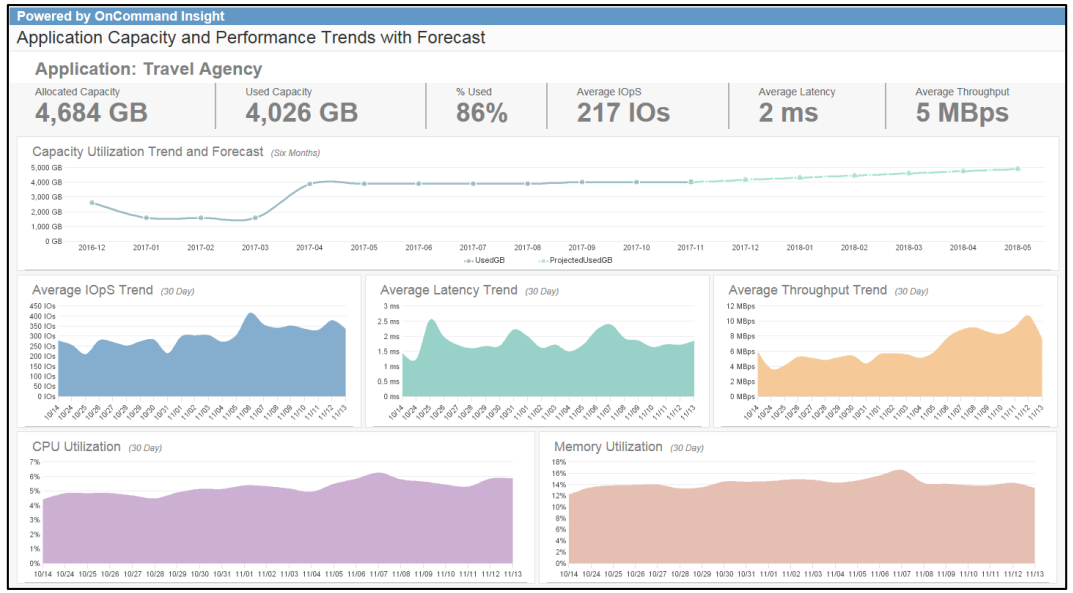
4.8 Application Capacity & Performance Trends with Forecast

Description: This dashboard shows Application Capacity and Performance trends including a 6-month capacity forecast. Capacity and Performance metrics summary is shown at top. Individual applications can be selected from the prompt page at run-time. Default will display all applications on individual pages at run-time. Capacity forecast is based on Compound Average Growth Rate (CAGR) function in MySQL and projected 6 months into the future. Performance charts are available showing 30-day trends.

Prerequisites: Annotations/definitions are necessary for Applications. Requires secondary ETL script to run nightly. There is a Non-ETL version as well. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Application	OCI configured annotation. Defines the application with host or internal volume capacity.
Date	Fulldate field derived from the Date Dimension tables in the DWH.
Allocated Capacity GB	Virtual Machine (VMDK), Volume or Internal Volume Allocated Capacity in GB associated with Applications.
Used Capacity GB	Virtual Machine (VMDK), Volume or Internal Volume Used Capacity in GB associated with Applications. If capacity is Thick Provisioned, then used will equal allocated.
% Used	Used Capacity GB / Allocated Capacity GB.
UsedGB	Same as Used Capacity GB.
ProjectedUsedGB	Compound Average Growth Rate (CAGR) projected used capacity in GB for each Application for 6 months into the future.
Average IOpS	Average Daily IOpS for applications associated with Virtual Machines, Physical Hosts or Internal Volumes collected for a period of 30 days.
Average Latency	Average Daily Latency in milliseconds for applications associated with Virtual Machines, Physical Hosts or Internal Volumes collected for a period of 30 days.
Average Throughput	Average Daily Throughput in MB/second for applications associated with Virtual Machines, Physical Hosts or Internal Volumes collected for a period of 30 days
CPU Utilization	For Virtual Machines with Applications (otherwise NULL), this is VM CPU Utilization % collected daily for 30 days.
Memory Utilization	For Virtual Machines with Applications (otherwise NULL), this is VM RAM Memory Utilization % collected daily for 30 days.

Click on the report screen shot above to view an enlarged image.

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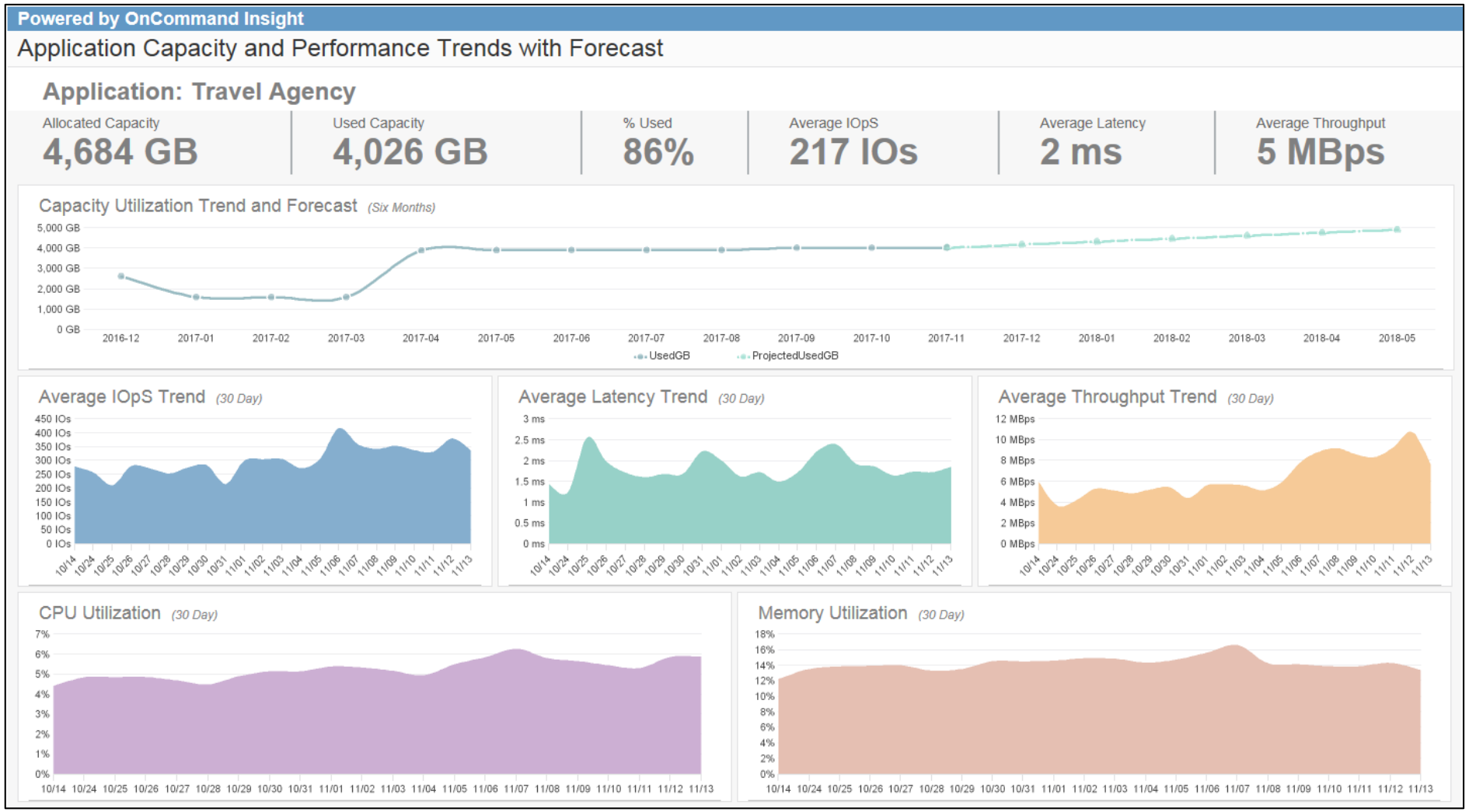

 Click on the screen shot above to return to the report description.

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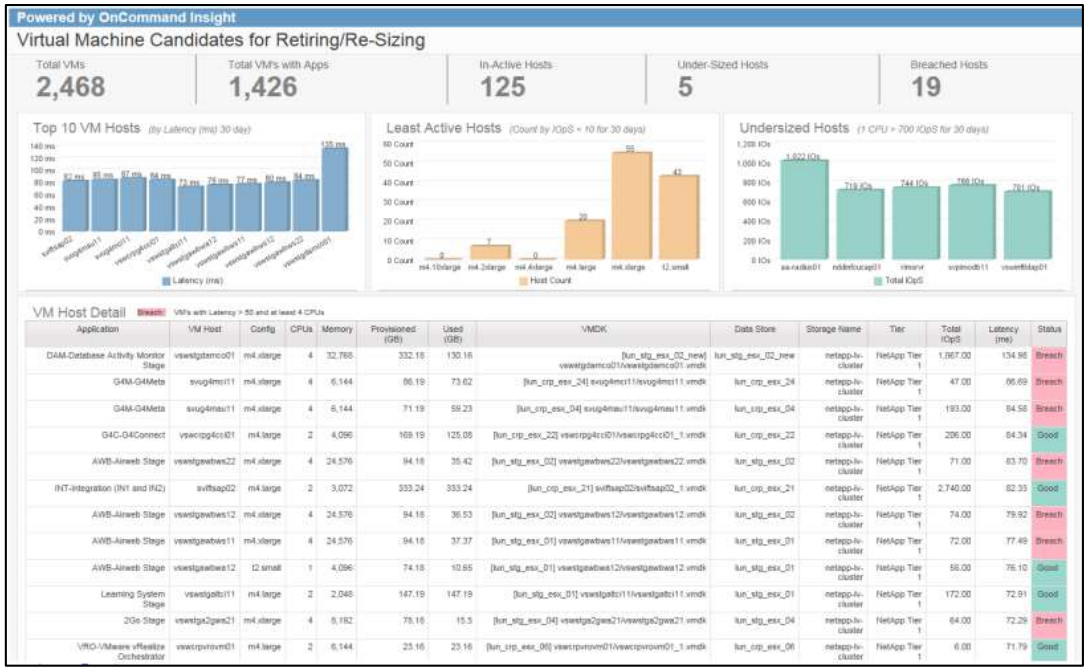
4.9 Virtual Machine Candidates for Re-Tiering or Re-Sizing

Description: This dashboard shows Virtual Machine candidates that are flagged for retiring or resizing based on configured criteria. If latency is greater than 50 milliseconds and CPU count is greater than 2, then a 'breach' flag is triggered. Inventory summary is displayed at top. Top 10 VMs by latency, least active by configuration and undersized hosts are shown in charts. VM Host detail list is visible at the bottom of the page.

Prerequisites: Annotations/definitions are necessary for Applications and Service Level/Tier. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Application	OCI configured annotation. Defines the application with host or internal volume capacity.
Tier	Name of the physical storage tier configured within OCI.
Storage	Name of the storage device monitored by OCI.
Data Store	Name of the Data Store associated with the ESX Host monitored by OCI.
VM Host	Name of the Virtual Machine associated with the ESX Host monitored by OCI.
VMDK	Name of the Virtual Disk associated with the Virtual Machine.
Config	Virtual Machine configuration using AWS standards: • WHEN CPUs = 1 THEN 't2.small', • WHEN CPUs <= 2 THEN 'm4.large', • WHEN CPUs <= 4 THEN 'm4.xlarge', • WHEN CPUs <= 8 THEN 'm4.2xlarge' • WHEN CPUs <= 16 THEN 'm4.4xlarge', • WHEN CPUs <= 40 THEN 'm4.10xlarge' • ELSE 'm4.16xlarge'
CPUs	Number of processors configured for each Virtual Machine.
Memory	Amount of RAM memory configured for each Virtual Machine.
Provisioned GB	Amount of capacity in GB provisioned from Data Stores to each Virtual Disk (VMDK).
Used GB	Amount of used capacity in GB as reported by each Virtual Machine. If capacity is Thick provisioned, then used will equal provisioned.
Total IOpS	Sum of Average IOpS as reported by the Virtual Disk associated with the Virtual Machine daily for 30 days.
Latency (ms)	Average Latency in milliseconds as reported by the Virtual Disk associated with the Virtual Machine daily for 30 days.
Status	If latency is greater than 50 milliseconds and CPU count is greater than 2, then a 'breach' flag is triggered.

Click on the report screen shot above to view an enlarged image.

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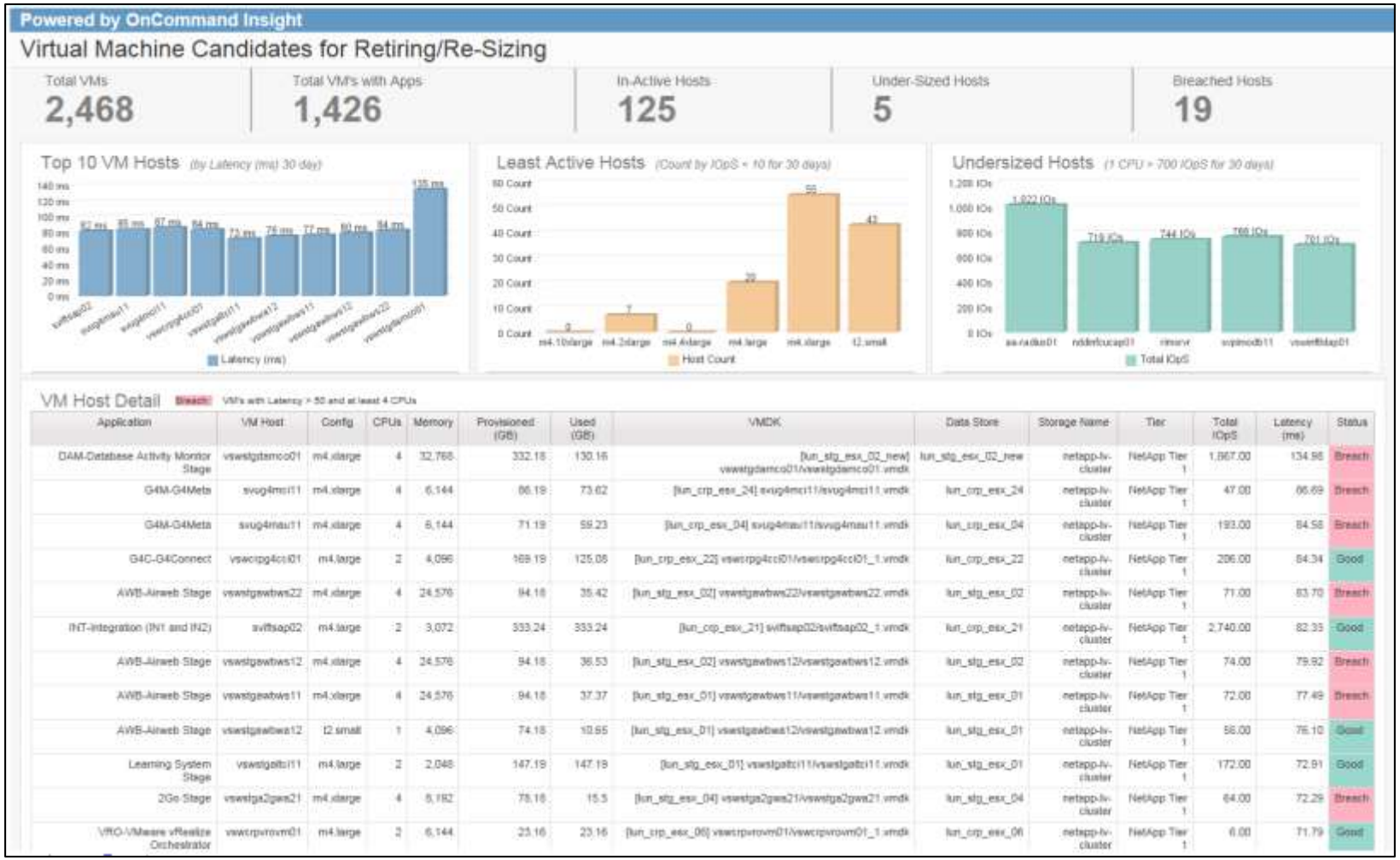

Application	VM Host	Config	CPUs	Memory	Provisioned (GB)	Used (GB)	VMDK	Data Store	Storage Name	Tier	Total IOpS	Latency (ms)	Status
DAM-Database Activity Monitor Stage	vswstgdamco01	m4.xlarge	4	32,768	332.18	130.16	[lun_stg_esx_02_new] vswstgdamco01/vswstgdamco01.vmdk	lun_stg_esx_02_new	netapp-lv-cluster	NetApp Tier 1	1,867.00	134.98	Breach
G4M-G4Meta	svug4mci11	m4.xlarge	4	6,144	86.19	73.62	[lun_crp_esx_24] svug4mci11/svug4mci11.vmdk	lun_crp_esx_24	netapp-lv-cluster	NetApp Tier 1	47.00	86.69	Breach
G4M-G4Meta	svug4mau11	m4.xlarge	4	6,144	71.19	59.23	[lun_crp_esx_04] svug4mau11/svug4mau11.vmdk	lun_crp_esx_04	netapp-lv-cluster	NetApp Tier 1	193.00	84.58	Breach
G4C-G4Connect	vswcrpg4cci01	m4.large	2	4,096	169.19	125.08	[lun_crp_esx_22] vswcrpg4cci01/vswcrpg4cci01_1.vmdk	lun_crp_esx_22	netapp-lv-cluster	NetApp Tier 1	206.00	84.34	Good
AWB-Airweb Stage	vswstgawbws22	m4.xlarge	4	24,576	94.18	35.42	[lun_stg_esx_02] vswstgawbws22/vswstgawbws22.vmdk	lun_stg_esx_02	netapp-lv-cluster	NetApp Tier 1	71.00	83.70	Breach
INT-Integration (IN1 and IN2)	swiftsap02	m4.large	2	3,072	333.24	333.24	[lun_crp_esx_21] swiftsap02/swiftsap02_1.vmdk	lun_crp_esx_21	netapp-lv-cluster	NetApp Tier 1	2,740.00	82.33	Good
AWB-Airweb Stage	vswstgawbws12	m4.xlarge	4	24,576	94.18	36.53	[lun_stg_esx_02] vswstgawbws12/vswstgawbws12.vmdk	lun_stg_esx_02	netapp-lv-cluster	NetApp Tier 1	74.00	79.92	Breach
AWB-Airweb Stage	vswstgawbws11	m4.xlarge	4	24,576	94.18	37.37	[lun_stg_esx_01] vswstgawbws11/vswstgawbws11.vmdk	lun_stg_esx_01	netapp-lv-cluster	NetApp Tier 1	72.00	77.49	Breach
AWB-Airweb Stage	vswstgawbws12	t2.small	1	4,096	74.18	10.65	[lun_stg_esx_01] vswstgawbws12/vswstgawbws12.vmdk	lun_stg_esx_01	netapp-lv-cluster	NetApp Tier 1	58.00	76.10	Good
Learning System Stage	vswstgaltci11	m4.large	2	2,048	147.19	147.19	[lun_stg_esx_01] vswstgaltci11/vswstgaltci11.vmdk	lun_stg_esx_01	netapp-lv-cluster	NetApp Tier 1	172.00	72.91	Good
2Go Stage	vswstga2gws21	m4.xlarge	4	8,192	78.18	15.5	[lun_stg_esx_04] vswstga2gws21/vswstga2gws21.vmdk	lun_stg_esx_04	netapp-lv-cluster	NetApp Tier 1	64.00	72.29	Breach
VRO-VMware vRealize Orchestrator	vswcrpvrovm01	m4.large	2	6,144	23.16	23.16	[lun_crp_esx_06] vswcrpvrovm01/vswcrpvrovm01_1.vmdk	lun_crp_esx_06	netapp-lv-cluster	NetApp Tier 1	6.00	71.79	Good

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Financial Management Overview

These are some of the day-to-day and monthly financial management tasks that can be addressed by leveraging the reports in this catalog. Here are some of the objectives met by this section:

- Actual spend vs. planned spend on storage assets
- Chargeback reporting
- Cost awareness
- Cost of IOpS
- Cost forecasting

* Any modifications to the Data Dictionary for the reports shown will require a custom report.

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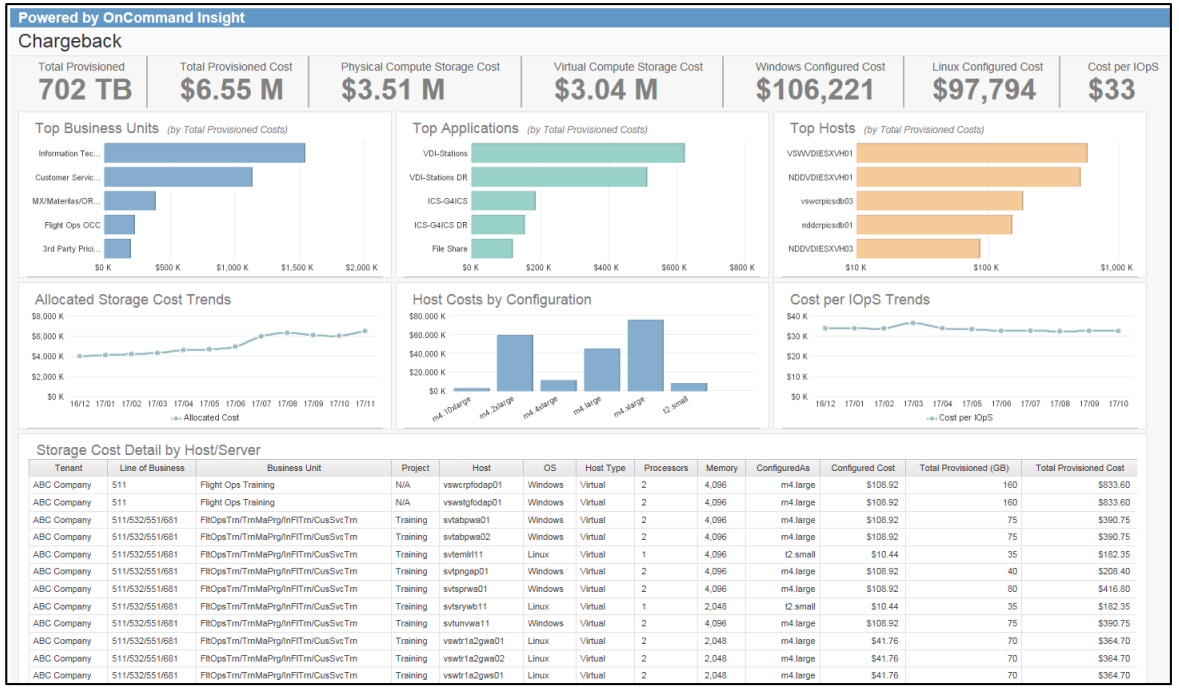
5.1 Chargeback (Compute and Storage) (Page 1 of 2)

Description: This dashboard shows Total Capacity Costs and Cost per IOpS which can be used for Compute and Storage Chargeback. A global summary of capacity and costs are visible at the top of the page. Top Business Units, Applications and Hosts are displayed in bar charts. Allocated storage costs and cost per IOpS are trended for up to 1 year. A detailed list of business entities and compute costs are available at the bottom.

Prerequisites: Annotations/definitions are necessary for Costs, Application, Tenant, Line of Business, Business Unit, Project and Service Level/Tier. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

See next page



 Click on the report screen shot above to view an enlarged image.

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5.1 Chargeback (Compute and Storage) (Page 2 of 2)

Field	Description
Tenant	OCI configured annotation. Defines the tenant associated with host or internal volume capacity.
Line of Business	OCI configured annotation. Defines the business unit associated with host or internal volume capacity.
Business Unit	OCI configured annotation. Defines the line of business associated with host or internal volume capacity.
Project	OCI configured annotation. Defines the line of project with host or internal volume capacity.
Application	OCI configured annotation. Defines the application with host or internal volume capacity.
Date	Fulldate field derived from the Date Dimension tables in the DWH.
Host	Name of the physical or virtual host monitored by OCI.
OS	Name of the host operating system. Physical non-ESX hosts will be equal to null (result of agentless config).
Host Type	Either virtual or physical.
Processors	Number of processors configured for virtual or ESX hosts.
Memory	Amount of memory configured for virtual or ESX hosts.
ConfiguredAs	Virtual Machine configuration using AWS standards: • WHEN CPUs = 1 THEN 't2.small', • WHEN CPUs <= 2 THEN 'm4.large', • WHEN CPUs <= 4 THEN 'm4.xlarge', • WHEN CPUs <= 8 THEN 'm4.2xlarge' • WHEN CPUs <= 16 THEN 'm4.4xlarge', • WHEN CPUs <= 40 THEN 'm4.10xlarge' • ELSE 'm4.16xlarge'

Data Dictionary

☐ **Select This Report**

Field	Description
Configured Cost	Based on user input parameters for costs associated with ConfiguredAs Virtual Machines.
Total Provisioned TB	Amount of capacity in TB provisioned to virtual and physical hosts.
Total Provisioned GB	Same as above but for GB.
Total Provisioned Cost	Virtual or physical host provisioned capacity * cost. Cost is either derived from ConfiguredAs parameters or the cost annotation defined in OCI and assigned to storage tiers.
Physical Compute Storage Cost	Cost of storage associated with physical hosts. Total Provisioned GB * Cost. Cost is derived from the cost annotation defined in OCI and assigned to storage tiers.
Virtual Compute Storage Cost	Cost of storage associated with virtual machines. Total Provisioned GB * Cost. Cost is derived from the cost annotation defined in OCI and assigned to storage tiers.
Windows Configured Cost	Based on user input parameters for costs associated with ConfiguredAs Windows based Virtual Machines.
Linux Configured Cost	Based on user input parameters for costs associated with ConfiguredAs Linux based Virtual Machines.
Pool IOpS Capability	IOpS Capability of the Storage Pool as published by the drive manufacturer. Example: a 15K SAS drive supports 200 IOpS.
Disk Capacity GB	Raw capacity of the physical disk in GB that supports the aggregate or storage pool.
Disk Capacity Cost	Disk Capacity Cost is derived from the cost annotation defined in OCI and assigned to storage tiers.
Cost per IOpS	Disk Cost * Disk Capacity GB / Pool IOpS Capability

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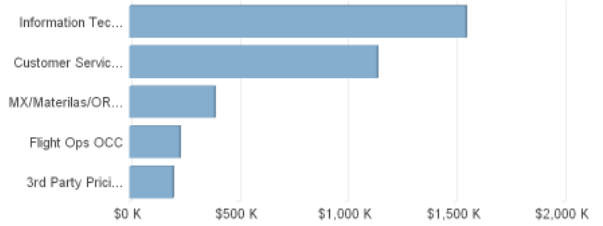
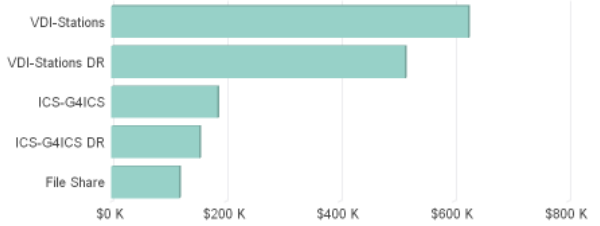
Chargeback

Total Provisioned	Total Provisioned Cost	Physical Compute Storage Cost	Virtual Compute Storage Cost	Windows Configured Cost	Linux Configured Cost	Cost per IOpS
702 TB	$6.55 M	$3.51 M	$3.04 M	$106,221	$97,794	$33

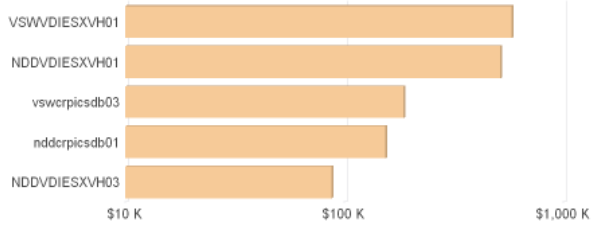
Top Business Units *(by Total Provisioned Costs)*



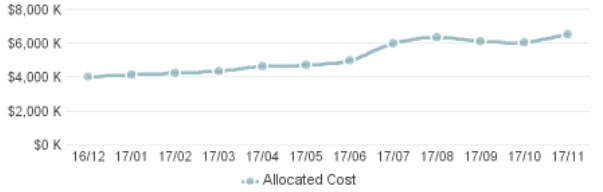
Top Applications *(by Total Provisioned Costs)*



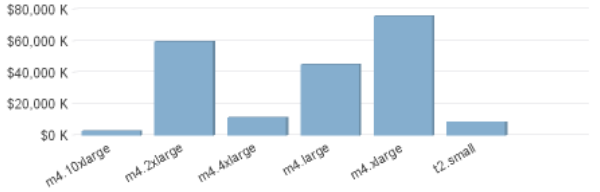
Top Hosts *(by Total Provisioned Costs)*



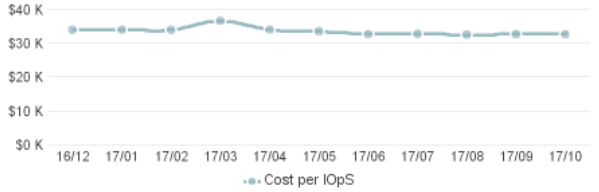
Allocated Storage Cost Trends



Host Costs by Configuration



Cost per IOpS Trends



Storage Cost Detail by Host/Server

Tenant	Line of Business	Business Unit	Project	Host	OS	Host Type	Processors	Memory	ConfiguredAs	Configured Cost	Total Provisioned (GB)	Total Provisioned Cost
ABC Company	511	Flight Ops Training	N/A	vswcrpfodap01	Windows	Virtual	2	4,096	m4.large	$108.92	160	$833.60
ABC Company	511	Flight Ops Training	N/A	vswstgfodap01	Windows	Virtual	2	4,096	m4.large	$108.92	160	$833.60
ABC Company	511/532/551/681	FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	Training	svtabpwa01	Windows	Virtual	2	4,096	m4.large	$108.92	75	$390.75
ABC Company	511/532/551/681	FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	Training	svtabpwa02	Windows	Virtual	2	4,096	m4.large	$108.92	75	$390.75
ABC Company	511/532/551/681	FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	Training	svtemlrl11	Linux	Virtual	1	4,096	t2.small	$10.44	35	$182.35
ABC Company	511/532/551/681	FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	Training	svtpngap01	Windows	Virtual	2	4,096	m4.large	$108.92	40	$208.40
ABC Company	511/532/551/681	FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	Training	svtsprwa01	Windows	Virtual	2	4,096	m4.large	$108.92	80	$416.80
ABC Company	511/532/551/681	FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	Training	svtsrywb11	Linux	Virtual	1	2,048	t2.small	$10.44	35	$182.35
ABC Company	511/532/551/681	FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	Training	svtunvwa11	Windows	Virtual	2	4,096	m4.large	$108.92	75	$390.75
ABC Company	511/532/551/681	FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	Training	vswtr1a2gwa01	Linux	Virtual	2	2,048	m4.large	$41.76	70	$364.70
ABC Company	511/532/551/681	FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	Training	vswtr1a2gwa02	Linux	Virtual	2	2,048	m4.large	$41.76	70	$364.70
ABC Company	511/532/551/681	FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	Training	vswtr1a2gws01	Linux	Virtual	2	2,048	m4.large	$41.76	70	$364.70

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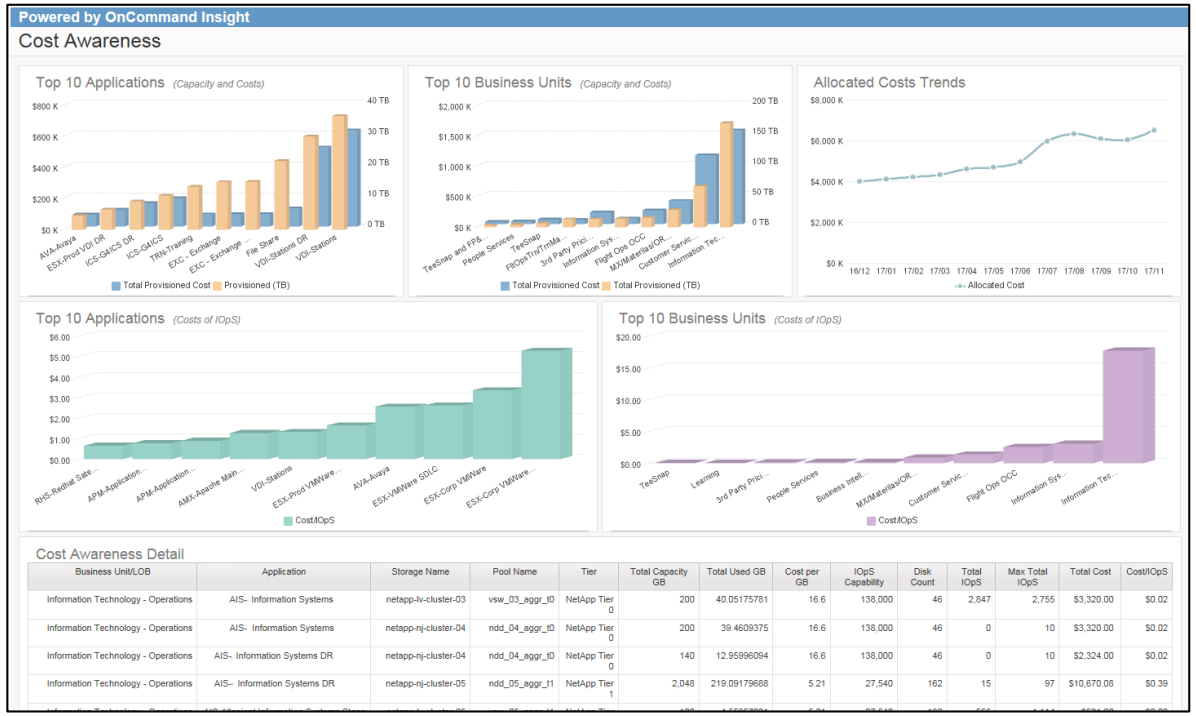
5.2 Cost Awareness

Description: This dashboard provides Costs Awareness focusing on Applications and Business Units. Top 10 Applications and Business Units Capacity Costs are visible. Allocated Global Costs trends are visible at the top right. A detailed list of costs associated with Applications and Business Units is visible on the bottom.

Prerequisites: Annotations/definitions are necessary for Costs, Application, Business Unit, and Service Level/Tier. Requires secondary ETL script to run nightly. This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Application	OCI configured annotation. Defines the application assigned to hosts or internal volumes.
Business Unit	OCI configured annotation. Defines business units or owners of resources assigned to hosts or internal volumes.
Tier	OCI configured annotation. Defines tiers of storage based on disk type, disk speed, etc.
Cost per GB	OCI configured annotation. Defines the cost per GB associated with storage tiers or service levels.
Storage Name	Name of the storage array (or filer) monitored by OCI.
Pool Name	Name of the storage manufacturer associated with the storage array (or filer) monitored by OCI.
Total Capacity GB	Provisioned Capacity in GB which is visible to host devices.
Total Used GB	Used Capacity in GB. If thick provisioned, then used = allocated. If thin provisioned, then used = written.
IOpS Capability	IOpS Capability of the Storage Pool as published by the drive manufacturer. Example: a 15K SAS drive supports 200 IOpS.
Total IOpS	Total IOpS (both read and write) averaged daily for 14 days.
Max Total IOpS	Max Total IOpS (both read and write) daily for 14 days.
Total Cost	Total Used GB * Cost per GB
Cost per IOpS	For this report Total Cost / IOpS Capability.
Date	Fulldate field derived from the Date Dimension tables in the DWH.

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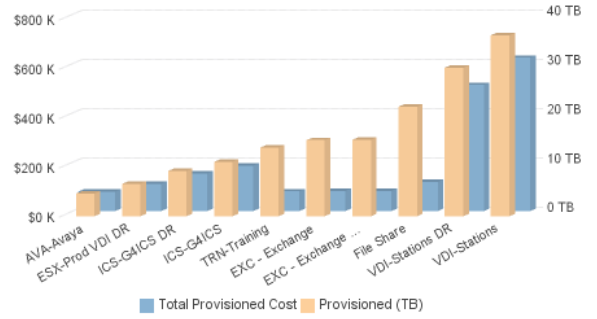
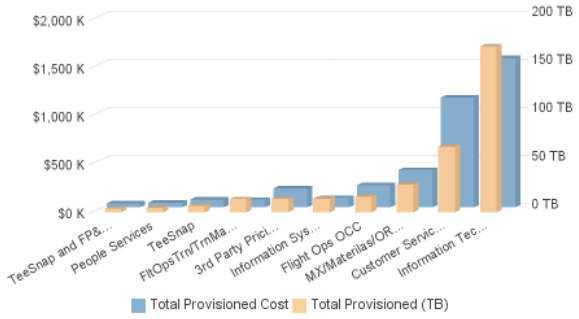
Cost Awareness

Top 10 Applications *(Capacity and Costs)*

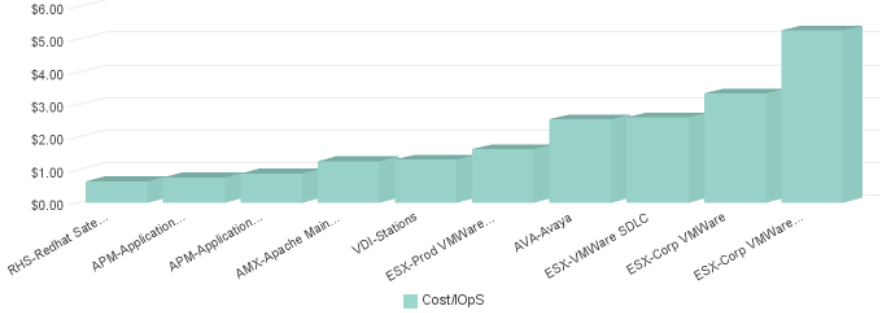


Top 10 Business Units *(Capacity and Costs)*

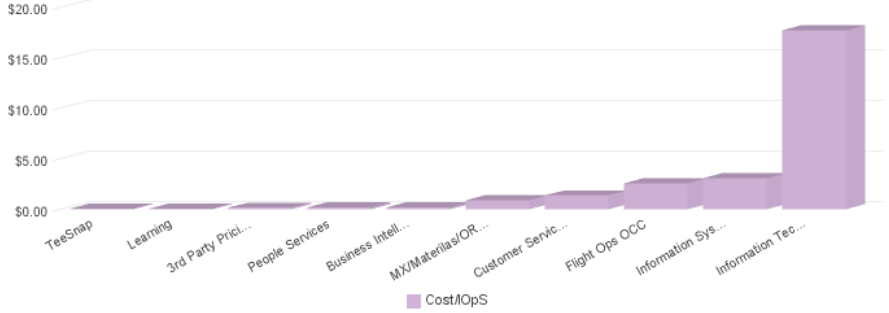


Allocated Costs Trends

Top 10 Applications *(Costs of IOpS)*



Top 10 Business Units *(Costs of IOpS)*



Cost Awareness Detail

Business Unit/LOB	Application	Storage Name	Pool Name	Tier	Total Capacity GB	Total Used GB	Cost per GB	IOpS Capability	Disk Count	Total IOpS	Max Total IOpS	Total Cost	Cost/IOpS
Information Technology - Operations	AIS- Information Systems	netapp-lv-cluster-03	vsw_03_aggr_t0	NetApp Tier 0	200	40.05175781	16.6	138,000	46	2,847	2,755	$3,320.00	$0.02
Information Technology - Operations	AIS- Information Systems	netapp-nj-cluster-04	ndd_04_aggr_t0	NetApp Tier 0	200	39.4609375	16.6	138,000	46	0	10	$3,320.00	$0.02
Information Technology - Operations	AIS-. Information Systems DR	netapp-nj-cluster-04	ndd_04_aggr_t0	NetApp Tier 0	140	12.95996094	16.6	138,000	46	0	10	$2,324.00	$0.02
Information Technology - Operations	AIS-- Information Systems DR	netapp-nj-cluster-05	ndd_05_aggr_t1	NetApp Tier 1	2,048	219.09179688	5.21	27,540	162	15	97	$10,670.08	$0.39

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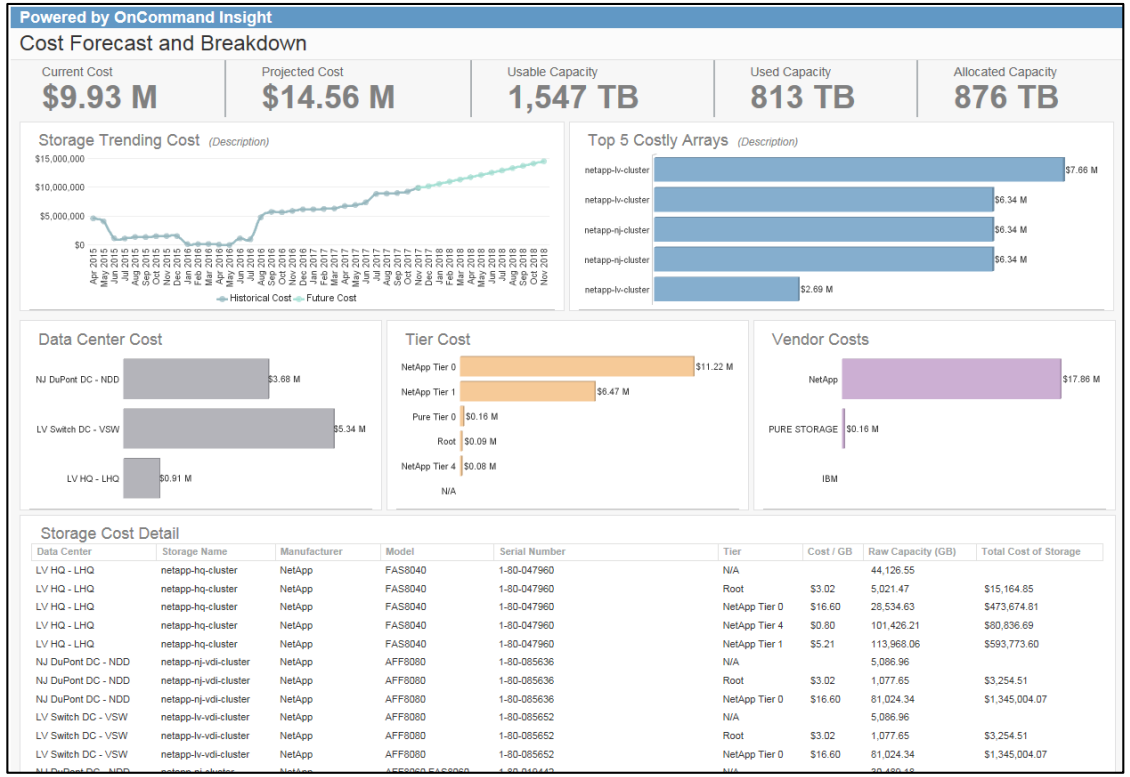
5.3 Cost Forecast and Breakdown

Description: This dashboard displays a Cost Forecast with breakdown by overall storage. A summary of capacity and costs is available at the top of the page. Charts for Top 5 Arrays; Data Center; Tier; and Top 5 Costliest Vendors are shown with a global cost forecast trend. Storage costs detail list is available at the bottom of the page.

Prerequisites: Annotations/definitions are necessary for Costs, Data Center, and Service Level/Tier. This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover and Plan.



Data Center	Storage Name	Manufacturer	Model	Serial Number	Tier	Cost / GB	Raw Capacity (GB)	Total Cost of Storage
LV HQ - LHQ	netapp-hq-cluster	NetApp	FAS8040	1-80-047960	N/A		44,126.55	
LV HQ - LHQ	netapp-hq-cluster	NetApp	FAS8040	1-80-047960	Root	$3.02	5,021.47	$15,164.85
LV HQ - LHQ	netapp-hq-cluster	NetApp	FAS8040	1-80-047960	NetApp Tier 0	$16.60	28,534.63	$473,674.81
LV HQ - LHQ	netapp-hq-cluster	NetApp	FAS8040	1-80-047960	NetApp Tier 4	$0.80	101,426.21	$80,836.69
LV HQ - LHQ	netapp-hq-cluster	NetApp	FAS8040	1-80-047960	NetApp Tier 1	$5.21	113,968.06	$593,773.60
NJ DuPont DC - NDD	netapp-nj-vdi-cluster	NetApp	AFF8080	1-80-085636	N/A		5,086.96	
NJ DuPont DC - NDD	netapp-nj-vdi-cluster	NetApp	AFF8080	1-80-085636	Root	$3.02	1,077.65	$3,254.51
NJ DuPont DC - NDD	netapp-nj-vdi-cluster	NetApp	AFF8080	1-80-085636	NetApp Tier 0	$16.60	81,024.34	$1,345,004.07
LV Switch DC - VSW	netapp-lv-vdi-cluster	NetApp	AFF8080	1-80-085652	N/A		5,086.96	
LV Switch DC - VSW	netapp-lv-vdi-cluster	NetApp	AFF8080	1-80-085652	Root	$3.02	1,077.65	$3,254.51
LV Switch DC - VSW	netapp-lv-vdi-cluster	NetApp	AFF8080	1-80-085652	NetApp Tier 0	$16.60	81,024.34	$1,345,004.07

Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	OCI configured annotation. Defines the physical location of the device.
Tier	OCI configured annotation. Defines tiers of storage based on disk type, disk speed, etc.
Cost / GB	OCI configured annotation. Same as cost. Defines the cost per GB associated with storage tiers or service levels.
Storage Name	Name of the storage array monitored by OCI.
Manufacturer/Vendor	Name of the manufacturer of the storage array monitored by OCI.
Model	Name of the model of the storage array monitored by OCI.
Serial Number	The serial number of the storage array monitored by OCI.
Raw Capacity (GB)	Pre-raid/post formatted capacity as reported by the storage array in TB.
Used Raw (GB)	Pre-raid/post formatted used capacity as reported by the storage array in TB.
Projected Used Raw (GB)	Forecast Pre-raid/post formatted Used Raw (TB) as reported by the storage pool and calculated via linear regression formula.
Total Cost of Storage	Used Raw (GB) * Cost / GB
Historical Cost	Total cost of storage for past N months.
Future Cost	Total cost of storage projected for future 12 months.
Date	Fulldate field derived from the Date Dimension tables in the DWH.

Click on the report screen shot above to view an enlarged image.

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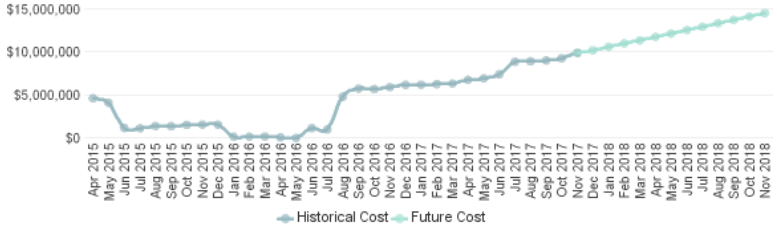
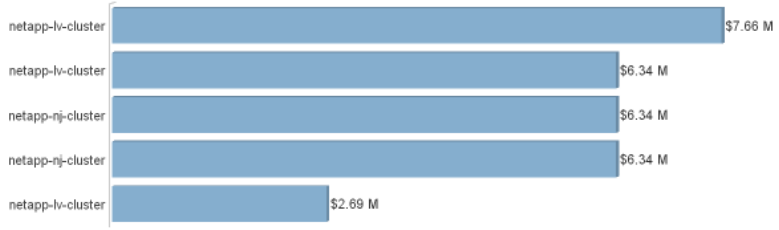
Cost Forecast and Breakdown

Current Cost	Projected Cost	Usable Capacity	Used Capacity	Allocated Capacity
$9.93 M	$14.56 M	1,547 TB	813 TB	876 TB

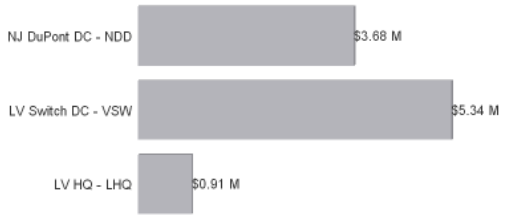
Storage Trending Cost *(Description)*



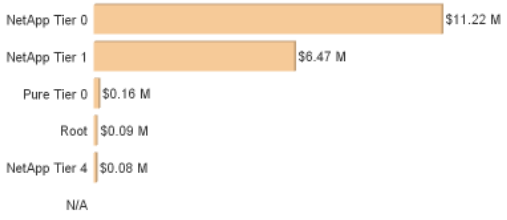
Top 5 Costly Arrays *(Description)*



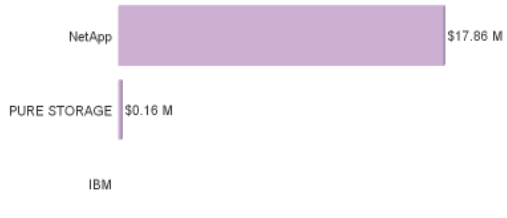
Data Center Cost



Tier Cost



Vendor Costs



Storage Cost Detail

Data Center	Storage Name	Manufacturer	Model	Serial Number	Tier	Cost / GB	Raw Capacity (GB)	Total Cost of Storage
LV HQ - LHQ	netapp-hq-cluster	NetApp	FAS8040	1-80-047960	N/A		44,126.55	
LV HQ - LHQ	netapp-hq-cluster	NetApp	FAS8040	1-80-047960	Root	$3.02	5,021.47	$15,164.85
LV HQ - LHQ	netapp-hq-cluster	NetApp	FAS8040	1-80-047960	NetApp Tier 0	$16.60	28,534.63	$473,674.81
LV HQ - LHQ	netapp-hq-cluster	NetApp	FAS8040	1-80-047960	NetApp Tier 4	$0.80	101,426.21	$80,836.69
LV HQ - LHQ	netapp-hq-cluster	NetApp	FAS8040	1-80-047960	NetApp Tier 1	$5.21	113,968.06	$593,773.60
NJ DuPont DC - NDD	netapp-nj-vdi-cluster	NetApp	AFF8080	1-80-085636	N/A		5,086.96	
NJ DuPont DC - NDD	netapp-nj-vdi-cluster	NetApp	AFF8080	1-80-085636	Root	$3.02	1,077.65	$3,254.51
NJ DuPont DC - NDD	netapp-nj-vdi-cluster	NetApp	AFF8080	1-80-085636	NetApp Tier 0	$16.60	81,024.34	$1,345,004.07
LV Switch DC - VSW	netapp-lv-vdi-cluster	NetApp	AFF8080	1-80-085652	N/A		5,086.96	
LV Switch DC - VSW	netapp-lv-vdi-cluster	NetApp	AFF8080	1-80-085652	Root	$3.02	1,077.65	$3,254.51
LV Switch DC - VSW	netapp-lv-vdi-cluster	NetApp	AFF8080	1-80-085652	NetApp Tier 0	$16.60	81,024.34	$1,345,004.07

 Click on the screen shot above to return to the report description.

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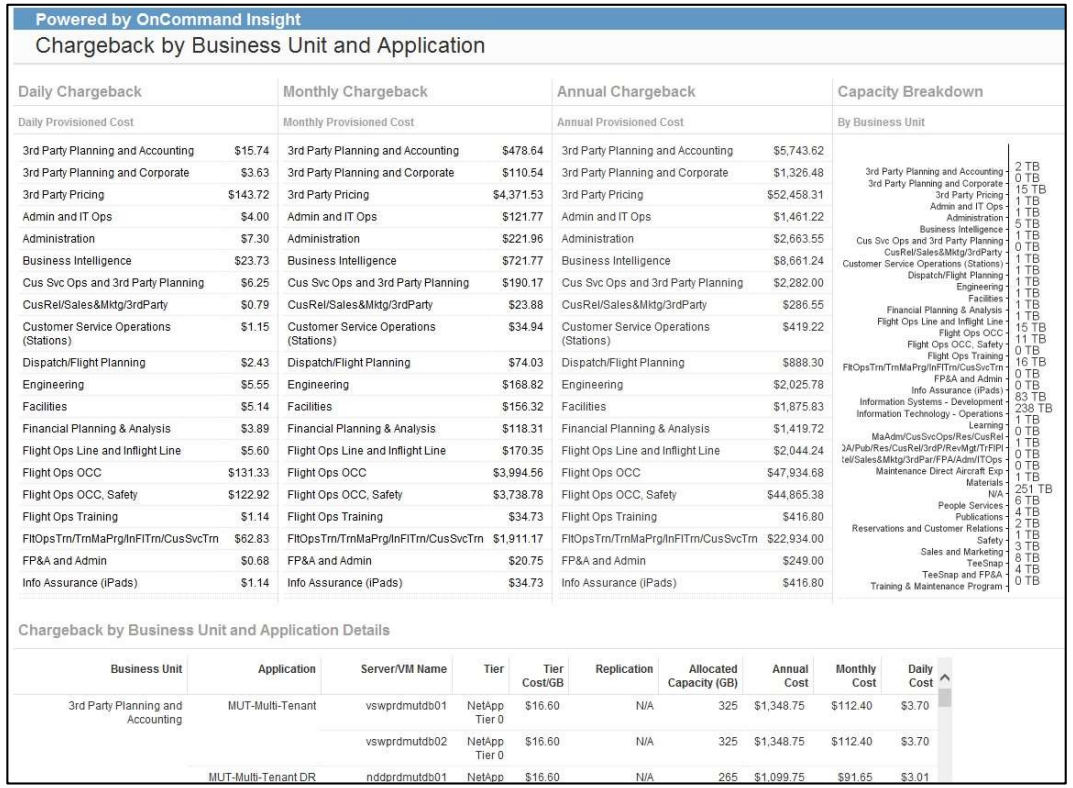
5.4 Chargeback by Business Unit and Application

Description: This report displays Daily, Monthly, and Annual Chargeback based on Provisioned Cost. On the right is a Capacity breakdown by Business Unit. The bottom section displays Daily, Monthly, and Annual Costs broken down by Business Unit and Application.

Prerequisites: Annotations/definitions are necessary for Costs, Application, Tenant, Line of Business, Business Unit, Project and Service Level/Tier. This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover and Plan.



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Chargeback by Business Unit and Application

Daily Chargeback

Daily Provisioned Cost	
3rd Party Planning and Accounting	$15.74
3rd Party Planning and Corporate	$3.63
3rd Party Pricing	$143.72
Admin and IT Ops	$4.00
Administration	$7.30
Business Intelligence	$23.73
Cus Svc Ops and 3rd Party Planning	$6.25
CusRel/Sales&Mktg/3rdParty	$0.79
Customer Service Operations (Stations)	$1.15
Dispatch/Flight Planning	$2.43
Engineering	$5.55
Facilities	$5.14
Financial Planning & Analysis	$3.89
Flight Ops Line and Inflight Line	$5.60
Flight Ops OCC	$131.33
Flight Ops OCC, Safety	$122.92
Flight Ops Training	$1.14
FltOpsTrn/TrnMaPrg/InFlTrn/CusSvcTrn	$62.83
FP&A and Admin	$0.68
Info Assurance (iPads)	$1.14

Monthly Chargeback

Monthly Provisioned Cost	
3rd Party Planning and Accounting	$478.64
3rd Party Planning and Corporate	$110.54
3rd Party Pricing	$4,371.53
Admin and IT Ops	$121.77
Administration	$221.96
Business Intelligence	$721.77
Cus Svc Ops and 3rd Party Planning	$190.17
CusRel/Sales&Mktg/3rdParty	$23.88
Customer Service Operations (Stations)	$34.94
Dispatch/Flight Planning	$74.03
Engineering	$168.82
Facilities	$156.32
Financial Planning & Analysis	$118.31
Flight Ops Line and Inflight Line	$170.35
Flight Ops OCC	$3,994.56
Flight Ops OCC, Safety	$3,738.78
Flight Ops Training	$34.73
FltOpsTrn/TrnMaPrg/InFlTrn/CusSvcTrn	$1,911.17
FP&A and Admin	$20.75
Info Assurance (iPads)	$34.73

Annual Chargeback

Annual Provisioned Cost	
3rd Party Planning and Accounting	$5,743.62
3rd Party Planning and Corporate	$1,326.48
3rd Party Pricing	$52,458.31
Admin and IT Ops	$1,461.22
Administration	$2,663.55
Business Intelligence	$8,661.24
Cus Svc Ops and 3rd Party Planning	$2,282.00
CusRel/Sales&Mktg/3rdParty	$286.55
Customer Service Operations (Stations)	$419.22
Dispatch/Flight Planning	$888.30
Engineering	$2,025.78
Facilities	$1,875.83
Financial Planning & Analysis	$1,419.72
Flight Ops Line and Inflight Line	$2,044.24
Flight Ops OCC	$47,934.68
Flight Ops OCC, Safety	$44,865.38
Flight Ops Training	$416.80
FltOpsTrn/TrnMaPrg/InFlTrn/CusSvcTrn	$22,934.00
FP&A and Admin	$249.00
Info Assurance (iPads)	$416.80

Capacity Breakdown

By Business Unit

Chargeback by Business Unit and Application Details

Business Unit	Application	Server/VM Name	Tier	Tier Cost/GB	Replication	Allocated Capacity (GB)	Annual Cost	Monthly Cost	Daily Cost
3rd Party Planning and Accounting	MUT-Multi-Tenant	vswprdmutdb01	NetApp Tier 0	$16.60	N/A	325	$1,348.75	$112.40	$3.70
		vswprdmutdb02	NetApp Tier 0	$16.60	N/A	325	$1,348.75	$112.40	$3.70
	MUT-Multi-Tenant DR	nddprdmutdb01	NetApp	$16.60	N/A	265	$1,099.75	$91.65	$3.01

Data Dictionary

☐ **Select This Report**

Field	Description
Business Unit	OCI configured annotation. Defines business units or owners of resources assigned to hosts or internal volumes.
Application	OCI configured annotation. Defines the application assigned to hosts or internal volumes.
Server/VM Name	Name of the physical or virtual server that has been discovered by OCI via Host Resolution or Virtual Center discovery.
Tier	OCI configured annotation. Defines tiers of storage based on disk type, disk speed, etc.
Tier Cost / GB	OCI configured annotation. Same as cost. Defines the cost per GB associated with storage tiers or service levels.
Server/VM Name	Name of the physical or virtual server that has been discovered by OCI via Host Resolution or Virtual Center discovery.
Replication	Is a replicated storage associated with the business unit or application.
Allocated Capacity (GB)	Capacity that is presented to physical or virtual hosts in GB.
Annual Cost	Business unit annual cost – Allocated Capacity(GB) * Tier Cost /GB rolled up for the past 12 months.
Monthly Cost	Business unit monthly cost – Allocated Capacity(GB) * Tier Cost /GB rolled up for the past month.
Daily Cost	Business unit daily cost – Allocated Capacity(GB) * Tier Cost /GB.

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Chargeback by Business Unit and Application

Daily Chargeback

Daily Provisioned Cost

3rd Party Planning and Accounting	$15.74
3rd Party Planning and Corporate	$3.63
3rd Party Pricing	$143.72
Admin and IT Ops	$4.00
Administration	$7.30
Business Intelligence	$23.73
Cus Svc Ops and 3rd Party Planning	$6.25
CusRel/Sales&Mktg/3rdParty	$0.79
Customer Service Operations (Stations)	$1.15
Dispatch/Flight Planning	$2.43
Engineering	$5.55
Facilities	$5.14
Financial Planning & Analysis	$3.89
Flight Ops Line and Inflight Line	$5.60
Flight Ops OCC	$131.33
Flight Ops OCC, Safety	$122.92
Flight Ops Training	$1.14
FltOpsTrn/TrnMaPrg/InFlTrn/CusSvcTrn	$62.83
FP&A and Admin	$0.68
Info Assurance (iPads)	$1.14

Monthly Chargeback

Monthly Provisioned Cost

3rd Party Planning and Accounting	$478.64
3rd Party Planning and Corporate	$110.54
3rd Party Pricing	$4,371.53
Admin and IT Ops	$121.77
Administration	$221.96
Business Intelligence	$721.77
Cus Svc Ops and 3rd Party Planning	$190.17
CusRel/Sales&Mktg/3rdParty	$23.88
Customer Service Operations (Stations)	$34.94
Dispatch/Flight Planning	$74.03
Engineering	$168.82
Facilities	$156.32
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Flight Ops Training	$34.73
FltOpsTrn/TrnMaPrg/InFlTrn/CusSvcTrn	$1,911.17
FP&A and Admin	$20.75
Info Assurance (iPads)	$34.73

Annual Chargeback

Annual Provisioned Cost

3rd Party Planning and Accounting	$5,743.62
3rd Party Planning and Corporate	$1,326.48
3rd Party Pricing	$52,458.31
Admin and IT Ops	$1,461.22
Administration	$2,663.55
Business Intelligence	$8,661.24
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CusRel/Sales&Mktg/3rdParty	$286.55
Customer Service Operations (Stations)	$419.22
Dispatch/Flight Planning	$888.30
Engineering	$2,025.78
Facilities	$1,875.83
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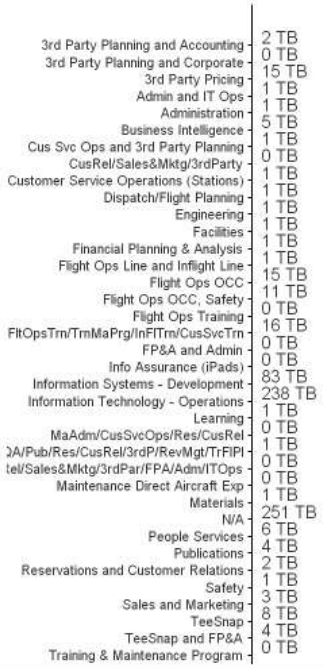
Flight Ops Line and Inflight Line	$2,044.24
Flight Ops OCC	$47,934.68
Flight Ops OCC, Safety	$44,865.38
Flight Ops Training	$416.80
FltOpsTrn/TrnMaPrg/InFlTrn/CusSvcTrn	$22,934.00
FP&A and Admin	$249.00
Info Assurance (iPads)	$416.80

Capacity Breakdown

By Business Unit



Chargeback by Business Unit and Application Details

Business Unit	Application	Server/VM Name	Tier	Tier Cost/GB	Replication	Allocated Capacity (GB)	Annual Cost	Monthly Cost	Daily Cost
3rd Party Planning and Accounting	MUT-Multi-Tenant	vswprdmutdb01	NetApp Tier 0	$16.60	N/A	325	$1,348.75	$112.40	$3.70
		vswprdmutdb02	NetApp Tier 0	$16.60	N/A	325	$1,348.75	$112.40	$3.70
	MUT-Multi-Tenant DR	nddprdmutdb01	NetApp	$16.60	N/A	265	$1,099.75	$91.65	$3.01

 Click on the screen shot above to return to the report description.

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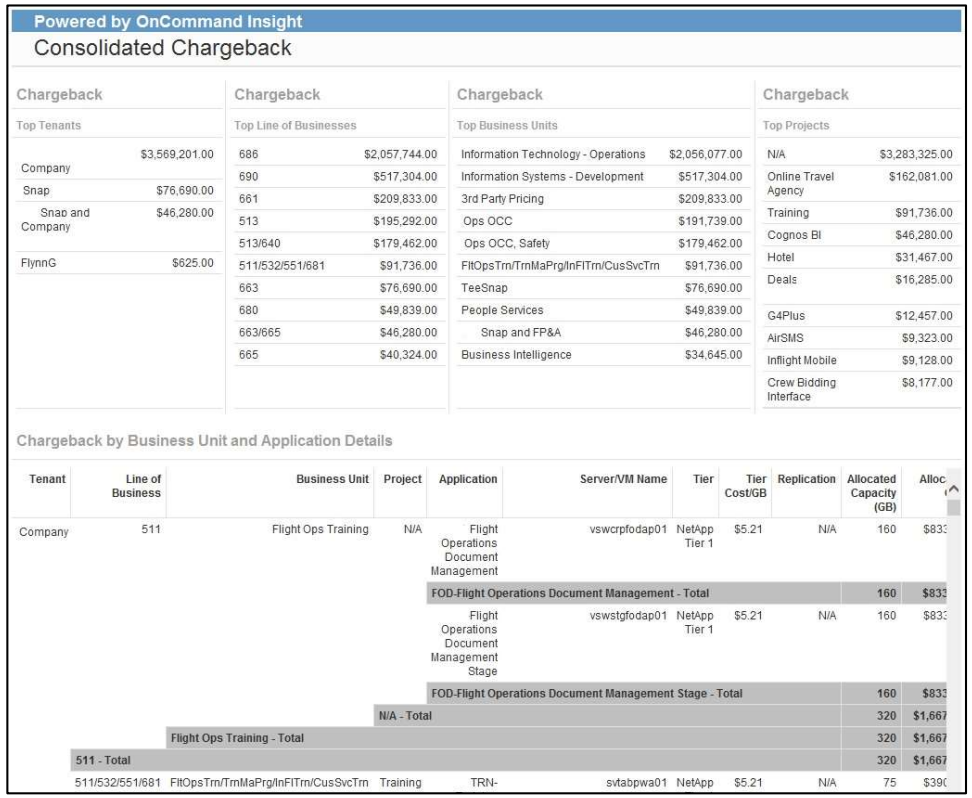
5.5 Consolidated Chargeback

Description: This report displays Daily, Monthly, and Annual Chargeback based on Provisioned Cost. On the right is a Capacity breakdown by Business Unit. The bottom section displays Daily, Monthly, and Annual Costs broken down by Business Unit and Application.

Prerequisites: Annotations/definitions are necessary for Costs, Application, Tenant, Line of Business, Business Unit, Project and Service Level/Tier. This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



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Consolidated Chargeback

Chargeback — Top Tenants

Company	$3,569,201.00
Snap	$76,690.00
Snap and Company	$46,280.00
FlynnG	$625.00

Chargeback — Top Line of Businesses

686	$2,057,744.00
690	$517,304.00
661	$209,833.00
513	$195,292.00
513/640	$179,462.00
511/532/551/681	$91,736.00
663	$76,690.00
680	$49,839.00
663/665	$46,280.00
665	$40,324.00

Chargeback — Top Business Units

Information Technology - Operations	$2,056,077.00
Information Systems - Development	$517,304.00
3rd Party Pricing	$209,833.00
Ops OCC	$191,739.00
Ops OCC, Safety	$179,462.00
FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	$91,736.00
TeeSnap	$76,690.00
People Services	$49,839.00
Snap and FP&A	$46,280.00
Business Intelligence	$34,645.00

Chargeback — Top Projects

N/A	$3,283,325.00
Online Travel Agency	$162,081.00
Training	$91,736.00
Cognos BI	$46,280.00
Hotel	$31,467.00
Deals	$16,285.00
G4Plus	$12,457.00
AirSMS	$9,323.00
Inflight Mobile	$9,128.00
Crew Bidding Interface	$8,177.00

Chargeback by Business Unit and Application Details

Tenant	Line of Business	Business Unit	Project	Application	Server/VM Name	Tier	Tier Cost/GB	Replication	Allocated Capacity (GB)	Alloc
Company	511	Flight Ops Training	N/A	Flight Operations Document Management	vswcrpfodap01	NetApp Tier 1	$5.21	N/A	160	$833
				FOD-Flight Operations Document Management - Total					160	$833
				Flight Operations Document Management Stage	vswstgfodap01	NetApp Tier 1	$5.21	N/A	160	$833
				FOD-Flight Operations Document Management Stage - Total					160	$833
			N/A - Total						320	$1,667
		Flight Ops Training - Total							320	$1,667
	511 - Total								320	$1,667
	511/532/551/681	FltOpsTrn/TrnMaPrg/InFITrn/CusSvcTrn	Training	TRN-	svtabpwa01	NetApp	$5.21	N/A	75	$390

Data Dictionary

☐ **Select This Report**

Field	Description
Tenant	OCI configured annotation. Defines the tenant associated with a host or internal volume.
Line of Business	OCI configured annotation. Defines the line of business associated with a host or internal volume.
Business Unit	OCI configured annotation. Defines the tenant business unit with a host or internal volume.
Project	OCI configured annotation. Defines the tenant project with a host or internal volume.
Application	OCI configured annotation. Defines the tenant application with a host or internal volume.
Tier	OCI configured annotation. Defines tiers of storage based on disk type, disk speed, etc.
Tier Cost / GB	OCI configured annotation. Same as cost. Defines the cost per GB associated with storage tiers or service levels.
Server/VM Name	Name of the physical or virtual server that has been discovered by OCI via Host Resolution or Virtual Center discovery.
Replication	Is a replicated storage associated with the business unit or application.
Allocated Capacity (GB)	Capacity that is presented to physical or virtual hosts in GB.
Allocated Cost	Allocated Capacity (GB) * Tier Cost / GB

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Consolidated Chargeback

Chargeback

Top Tenants

Company	$3,569,201.00
Snap	$76,690.00
Snap and Company	$46,280.00
FlynnG	$625.00

Chargeback

Top Line of Businesses

686	$2,057,744.00
690	$517,304.00
661	$209,833.00
513	$195,292.00
513/640	$179,462.00
511/532/551/681	$91,736.00
663	$76,690.00
680	$49,839.00
663/665	$46,280.00
665	$40,324.00

Chargeback

Top Business Units

Information Technology - Operations	$2,056,077.00
Information Systems - Development	$517,304.00
3rd Party Pricing	$209,833.00
Ops OCC	$191,739.00
Ops OCC, Safety	$179,462.00
FltOpsTrn/TrnMaPrg/InFlTrn/CusSvcTrn	$91,736.00
TeeSnap	$76,690.00
People Services	$49,839.00
Snap and FP&A	$46,280.00
Business Intelligence	$34,645.00

Chargeback

Top Projects

N/A	$3,283,325.00
Online Travel Agency	$162,081.00
Training	$91,736.00
Cognos BI	$46,280.00
Hotel	$31,467.00
Deals	$16,285.00
G4Plus	$12,457.00
AirSMS	$9,323.00
Inflight Mobile	$9,128.00
Crew Bidding Interface	$8,177.00

Chargeback by Business Unit and Application Details

Tenant	Line of Business	Business Unit	Project	Application	Server/VM Name	Tier	Tier Cost/GB	Replication	Allocated Capacity (GB)	Alloc
Company	511	Flight Ops Training	N/A	Flight Operations Document Management	vswcrpfodap01	NetApp Tier 1	$5.21	N/A	160	$833
				FOD-Flight Operations Document Management - Total					**160**	**$833**
				Flight Operations Document Management Stage	vswstgfodap01	NetApp Tier 1	$5.21	N/A	160	$833
				FOD-Flight Operations Document Management Stage - Total					**160**	**$833**
			N/A - Total						**320**	**$1,667**
		Flight Ops Training - Total							**320**	**$1,667**
	511 - Total								**320**	**$1,667**
	511/532/551/681	FltOpsTrn/TrnMaPrg/InFlTrn/CusSvcTrn	Training	TRN-	svtabpwa01	NetApp	$5.21	N/A	75	$39(

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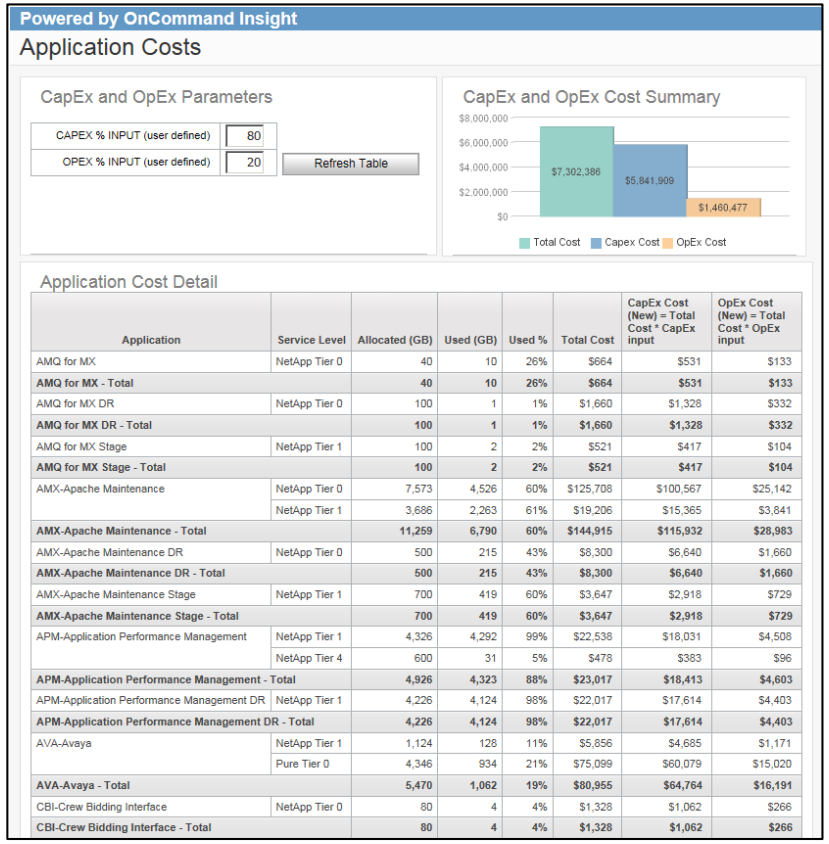
NetApp

5.6 Application Costs with OpEx and CapEx Offset

Description: A simple, interactive Application OpEx and CapEx report showing Application costs by service levels. User defined CapEx and OpEx percentages can be entered as desired.

Prerequisites: Annotations/definitions are necessary for Costs, Applications and Service Level/Tier. This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover and Plan.



Application	Service Level	Allocated (GB)	Used (GB)	Used %	Total Cost	CapEx Cost (New) = Total Cost * CapEx input	OpEx Cost (New) = Total Cost * OpEx input
AMQ for MX	NetApp Tier 0	40	10	26%	$664	$531	$133
AMQ for MX - Total		**40**	**10**	**26%**	**$664**	**$531**	**$133**
AMQ for MX DR	NetApp Tier 0	100	1	1%	$1,660	$1,328	$332
AMQ for MX DR - Total		**100**	**1**	**1%**	**$1,660**	**$1,328**	**$332**
AMQ for MX Stage	NetApp Tier 1	100	2	2%	$521	$417	$104
AMQ for MX Stage - Total		**100**	**2**	**2%**	**$521**	**$417**	**$104**
AMX-Apache Maintenance	NetApp Tier 0	7,573	4,526	60%	$125,708	$100,567	$25,142
	NetApp Tier 1	3,686	2,263	61%	$19,206	$15,365	$3,841
AMX-Apache Maintenance - Total		**11,259**	**6,790**	**60%**	**$144,915**	**$115,932**	**$28,983**
AMX-Apache Maintenance DR	NetApp Tier 0	500	215	43%	$8,300	$6,640	$1,660
AMX-Apache Maintenance DR - Total		**500**	**215**	**43%**	**$8,300**	**$6,640**	**$1,660**
AMX-Apache Maintenance Stage	NetApp Tier 1	700	419	60%	$3,647	$2,918	$729
AMX-Apache Maintenance Stage - Total		**700**	**419**	**60%**	**$3,647**	**$2,918**	**$729**
APM-Application Performance Management	NetApp Tier 1	4,326	4,292	99%	$22,538	$18,031	$4,508
	NetApp Tier 4	600	31	5%	$478	$383	$96
APM-Application Performance Management - Total		**4,926**	**4,323**	**88%**	**$23,017**	**$18,413**	**$4,603**
APM-Application Performance Management DR	NetApp Tier 1	4,226	4,124	98%	$22,017	$17,614	$4,403
APM-Application Performance Management DR - Total		**4,226**	**4,124**	**98%**	**$22,017**	**$17,614**	**$4,403**
AVA-Avaya	NetApp Tier 1	1,124	128	11%	$5,856	$4,685	$1,171
	Pure Tier 0	4,346	934	21%	$75,099	$60,079	$15,020
AVA-Avaya - Total		**5,470**	**1,062**	**19%**	**$80,955**	**$64,764**	**$16,191**
CBI-Crew Bidding Interface	NetApp Tier 0	80	4	4%	$1,328	$1,062	$266
CBI-Crew Bidding Interface - Total		**80**	**4**	**4%**	**$1,328**	**$1,062**	**$266**

Data Dictionary

☐ **Select This Report**

Field	Description
Application	OCI configured annotation. Defines the tenant application with a host or internal volume.
Service Level	OCI configured annotation. Defines tiers or service levels of storage based on disk type, disk speed, IOpS/TB etc.
Cost	Cost annotation configured in OCI and assigned to a storage tier.
Allocated (GB)	The capacity of volumes accessed by hosts, used for replication and volumes that are masked but no access path to them exists
Used (GB)	Used Capacity in TB, shows block written or data files written if from thin provisioned device, will equal Allocated if thick provisioned.
Used %	Used (TB) / Allocated (GB)
Total Cost	[Cost] * [Allocated (GB)]
CapEx Cost	[CapEx %] * [Total Cost]
OpEx Cost	[OpEx %] * [Total Cost]
CapEx %	User defined input default of 80%.
OpEx %	User defined input default of 20%.

Click on the report screen shot above to view an enlarged image.

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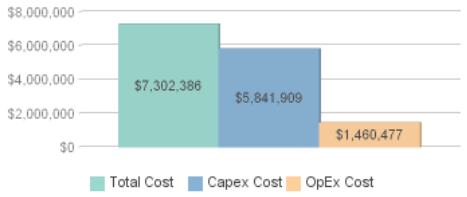
Application Costs

CapEx and OpEx Parameters

CAPEX % INPUT (user defined)	80
OPEX % INPUT (user defined)	20

Refresh Table

CapEx and OpEx Cost Summary



Application Cost Detail

Application	Service Level	Allocated (GB)	Used (GB)	Used %	Total Cost	CapEx Cost (New) = Total Cost * CapEx input	OpEx Cost (New) = Total Cost * OpEx input
AMQ for MX	NetApp Tier 0	40	10	26%	$664	$531	$133
AMQ for MX - Total		**40**	**10**	**26%**	**$664**	**$531**	**$133**
AMQ for MX DR	NetApp Tier 0	100	1	1%	$1,660	$1,328	$332
AMQ for MX DR - Total		**100**	**1**	**1%**	**$1,660**	**$1,328**	**$332**
AMQ for MX Stage	NetApp Tier 1	100	2	2%	$521	$417	$104
AMQ for MX Stage - Total		**100**	**2**	**2%**	**$521**	**$417**	**$104**
AMX-Apache Maintenance	NetApp Tier 0	7,573	4,526	60%	$125,708	$100,567	$25,142
	NetApp Tier 1	3,686	2,263	61%	$19,206	$15,365	$3,841
AMX-Apache Maintenance - Total		**11,259**	**6,790**	**60%**	**$144,915**	**$115,932**	**$28,983**
AMX-Apache Maintenance DR	NetApp Tier 0	500	215	43%	$8,300	$6,640	$1,660
AMX-Apache Maintenance DR - Total		**500**	**215**	**43%**	**$8,300**	**$6,640**	**$1,660**
AMX-Apache Maintenance Stage	NetApp Tier 1	700	419	60%	$3,647	$2,918	$729
AMX-Apache Maintenance Stage - Total		**700**	**419**	**60%**	**$3,647**	**$2,918**	**$729**
APM-Application Performance Management	NetApp Tier 1	4,326	4,292	99%	$22,538	$18,031	$4,508
	NetApp Tier 4	600	31	5%	$478	$383	$96
APM-Application Performance Management - Total		**4,926**	**4,323**	**88%**	**$23,017**	**$18,413**	**$4,603**
APM-Application Performance Management DR	NetApp Tier 1	4,226	4,124	98%	$22,017	$17,614	$4,403
APM-Application Performance Management DR - Total		**4,226**	**4,124**	**98%**	**$22,017**	**$17,614**	**$4,403**
AVA-Avaya	NetApp Tier 1	1,124	128	11%	$5,856	$4,685	$1,171
	Pure Tier 0	4,346	934	21%	$75,099	$60,079	$15,020
AVA-Avaya - Total		**5,470**	**1,062**	**19%**	**$80,955**	**$64,764**	**$16,191**
CBI-Crew Bidding Interface	NetApp Tier 0	80	4	4%	$1,328	$1,062	$266
CBI-Crew Bidding Interface - Total		**80**	**4**	**4%**	**$1,328**	**$1,062**	**$266**

 Click on the screen shot above to return to the report description.

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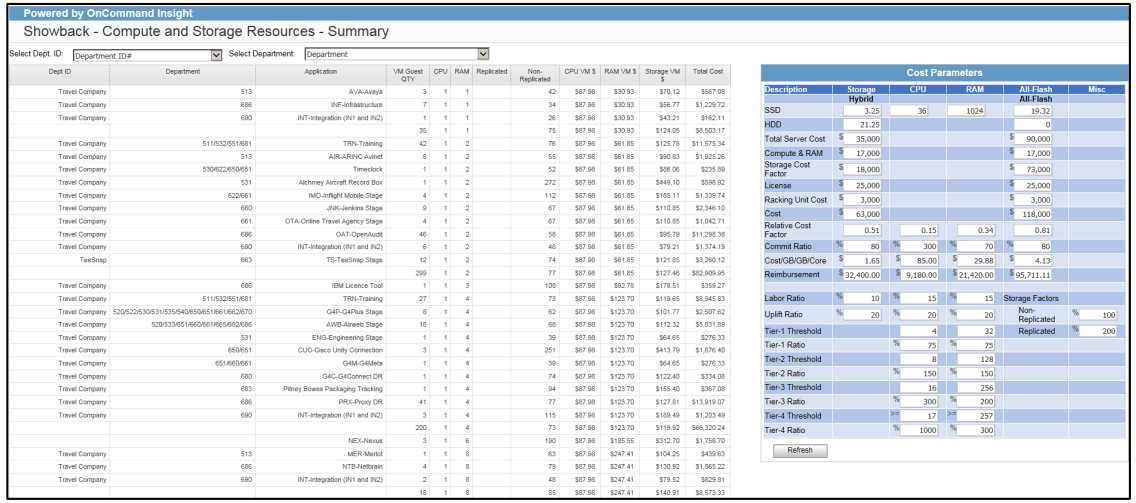
5.7 Showback – Compute and Storage Resources (Page 1 of 2)

Description: This real-world showback report shows costs for compute and storage resources. Cost parameters are added at run-time and have a high degree of complexity when applied to compute resources. This example can be used to customize a similar artifact for prospective users.

Compute tiers are based on CPU and Memory allocations and are represented by Cognos configured variables/parameters. Dept ID and Department are based on business entity annotations configured in OCI. Summary and detail pages are available with user selectable drop-downs for Dept ID and Department filters.

Prerequisites: Annotations/definitions are necessary for Application, Tenant and Line of Business. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI Discover and Plan.



Data Dictionary

See next page

Field	Description
Dept ID	OCI configured annotation. Defines the tenant associated with host or internal volume capacity.
Department	OCI configured annotation. Defines the business unit associated with host or internal volume capacity.
Application	OCI configured annotation. Defines the tenant application with a host or internal volume.
VM Guest QTY	Virtual Machine Count.
CPU	Number of CPUs allocated to virtual machines.
RAM	Amount of RAM allocated to virtual machines.
Replicated	Indicates whether the virtual machine provisioned capacity in GB is replicated.
Non-Replicated	Indicates whether the virtual machine provisioned capacity in GB is NOT replicated.
LaborRatioCPU	OCI/Cognos configured parameter/variable. Defines the annual rate of increase % in labor charges . Default is 15%.
UpliftRatioCPU	OCI/Cognos configured parameter/variable. Defines the annual rate of increase % in equipment charges. Default is 20%.
Tier1ThresholdCPU	OCI/Cognos configured parameter/variable. Defines the Tier-1 compute resource configuration for CPUs. Default is 4.
Tier1RatioCPU	OCI/Cognos configured parameter/variable. Defines the cost ratio applied to the fixed cost (costCoreCPU) parameter. Default is 75%.
Tier2ThresholdCPU	OCI/Cognos configured parameter/variable. Defines the Tier-1 compute resource configuration for CPUs. Default is 8.
Tier2RatioCPU	OCI/Cognos configured parameter/variable. Defines the cost ratio applied to the fixed cost (costCoreCPU) parameter. Default is 150%.
Tier3ThresholdCPU	OCI/Cognos configured parameter/variable. Defines the Tier-1 compute resource configuration for CPUs. Default is 16.
Tier3RatioCPU	OCI/Cognos configured parameter/variable. Defines the cost ratio applied to the fixed cost (costCoreCPU) parameter. Default is 300%.

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5.7 Showback – Compute and Storage Resources (Page 2 of 2)

Field	Description
Tier4ThresholdCPU	OCI/Cognos configured parameter/variable. Defines the Tier-1 compute resource configuration for CPUs. Default is 17.
Tier4RatioCPU	OCI/Cognos configured parameter/variable. Defines the cost ratio applied to the fixed cost (costCoreCPU) parameter. Default is 1000%.
nonreplicated	OCI/Cognos configured parameter/variable. Defines storage cost factor for nonreplicated storage. Default is 100%.
costCoreCPU	OCI/Cognos configured parameter/variable. Cost per GB of provisioned capacity, GB of RAM or CPU. Default is $85.00 for CPU.
CPU VM $	(1 + LaborRatioCPU /100)) * (1 + (UpliftRatioCPU/100)) * (LEAST(tier1ThresholdCPU, dwh_inventory.hv_virtual_machine.processors) * costCoreCPU * (tier1RatioCPU/100) + GREATEST(LEAST(tier2ThresholdCPU - tier1ThresholdCPU,dwh_inventory.hv_virtual_machine.processors - tier1ThresholdCPU * costCoreCPU * (tier2RatioCPU/100), 0) + GREATEST(LEAST(tier3ThresholdCPU - tier2ThresholdCPU, dwh_inventory.hv_virtual_machine.processors - tier2ThresholdCPU * costCoreCPU * tier3RatioCPU/100), 0)+GREATEST(dwh_inventory.hv_virtual_machine.processors - tier3ThresholdCPU), 0) * costCoreCPU * (tier4RatioCPU/100)) * (nonreplicated/100) * (nonreplicated/100)
LaborRatioRAM	OCI/Cognos configured parameter/variable. Defines the annual rate of increase % in labor charges . Default is 15%.
UpliftRatioRAM	OCI/Cognos configured parameter/variable. Defines the annual rate of increase % in equipment charges. Default is 20%.
Tier1ThresholdRAM	OCI/Cognos configured parameter/variable. Defines the Tier-1 compute resource configuration for RAM. Default is 32.
Tier1RatioRAM	OCI/Cognos configured parameter/variable. Defines the cost ratio applied to the fixed cost (costCoreRAM) parameter. Default is 75%.
Tier2ThresholdRAM	OCI/Cognos configured parameter/variable. Defines the Tier-1 compute resource configuration for RAM. Default is 128.

Data Dictionary (cont'd)

See previous page

☐ **Select This Report**

Field	Description
Tier2RatioRAM	OCI/Cognos configured parameter/variable. Defines the cost ratio applied to the fixed cost (costCoreRAM) parameter. Default is 150%.
Tier3ThresholdRAM	OCI/Cognos configured parameter/variable. Defines the Tier-1 compute resource configuration for RAM. Default is 256.
Tier3RatioRAM	OCI/Cognos configured parameter/variable. Defines the cost ratio applied to the fixed cost (costCoreRAM) parameter. Default is 200%.
Tier4ThresholdRAM	OCI/Cognos configured parameter/variable. Defines the Tier-1 compute resource configuration for RAM. Default is 257.
Tier4RatioRAM	OCI/Cognos configured parameter/variable. Defines the cost ratio applied to the fixed cost (costCoreRAM) parameter. Default is 300%.
costCoreRAM	OCI/Cognos configured parameter/variable. Cost per GB of provisioned capacity, GB of RAM or CPU. Default is $29.88 for RAM.
RAM VM $	(1 + (LaborRatioRAM/100)) * (1 + (UpliftRatioRAM/100)) * (LEAST(tier1ThresholdRAM, ROUND(dwh_inventory.hv_virtual_machine.memory/1024,0)) * costCoreRAM * (tier1RatioRAM/100) + GREATEST(LEAST(tier2ThresholdRAM - tier1ThresholdRAM, ROUND(dwh_inventory.hv_virtual_machine.memory/1024,0) - tier1ThresholdRAM * costCoreRAM * (tier2RatioRAM/100), 0)+ GREATEST(LEAST(tier3ThresholdRAM - tier2ThresholdRAM , ROUND(dwh_inventory.hv_virtual_machine.memory/1024,0) - tier2ThresholdRAM)) * costCoreRAM * ((tier3RatioRAM/100), 0)+GREATEST(ROUND(dwh_inventory.hv_virtual_machine.memory/1024,0) - (tier3ThresholdRAM), 0) * (costCoreRAM) * ((tier4RatioRAM)/100)) * ((nonreplicated/100) * ((nonreplicated/100)
costCoreStorage	OCI/Cognos configured parameter/variable. Cost per GB of provisioned capacity. Default is $1.65.
Storage VM $	costCoreStorage * ((ROUND(SUM(dwh_inventory.hv_virtual_machine.provisionedCapacityMB)/1024,2) / COUNT(dwh_inventory.hv_virtual_machine.id)) * (nonreplicated/100))
Total Cost	VM Guest QTY * (CPU VM $ + RAM VM $ + Storage VM $)

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Showback - Compute and Storage Resources - Summary

Select Dept. ID: Department ID# Select Department: Department

Dept ID	Department	Application	VM Guest QTY	CPU	RAM	Replicated	Non-Replicated	CPU VM $	RAM VM $	Storage VM $	Total Cost
Travel Company	513	AVA-Avaya	3	1	1		42	$87.98	$30.93	$70.12	$567.08
Travel Company	686	INF-Infrastructure	7	1	1		34	$87.98	$30.93	$56.77	$1,229.72
Travel Company	690	INT-Integration (IN1 and IN2)	1	1	1		26	$87.98	$30.93	$43.21	$162.11
			35	1	1		75	$87.98	$30.93	$124.05	$8,503.17
Travel Company	511/532/551/681	TRN-Training	42	1	2		76	$87.98	$61.85	$125.78	$11,575.34
Travel Company	513	AIR-ARINC Avinet	8	1	2		55	$87.98	$61.85	$90.83	$1,925.26
Travel Company	530/622/650/651	Timeclock	1	1	2		52	$87.98	$61.85	$86.06	$235.89
Travel Company	531	Alchmey Aircraft Record Box	1	1	2		272	$87.98	$61.85	$449.10	$598.92
Travel Company	622/661	IMO-Inflight Mobile Stage	4	1	2		112	$87.98	$61.85	$185.11	$1,339.74
Travel Company	660	JNK-Jenkins Stage	9	1	2		67	$87.98	$61.85	$110.85	$2,346.10
Travel Company	661	OTA-Online Travel Agency Stage	4	1	2		67	$87.98	$61.85	$110.85	$1,042.71
Travel Company	686	OAT-OpenAudit	46	1	2		58	$87.98	$61.85	$95.79	$11,298.38
Travel Company	690	INT-Integration (IN1 and IN2)	6	1	2		48	$87.98	$61.85	$79.21	$1,374.19
TeeSnap	663	TS-TeeSnap Stage	12	1	2		74	$87.98	$61.85	$121.85	$3,260.12
			299	1	2		77	$87.98	$61.85	$127.46	$82,909.95
Travel Company	686	IBM Licence Tool	1	1	3		108	$87.98	$92.78	$178.51	$359.27
Travel Company	511/532/551/681	TRN-Training	27	1	4		73	$87.98	$123.70	$119.65	$8,945.83
Travel Company	520/522/530/531/535/540/650/651/661/662/670	G4P-G4Plus Stage	8	1	4		62	$87.98	$123.70	$101.77	$2,507.62
Travel Company	520/533/651/660/661/665/682/686	AWB-Airweb Stage	18	1	4		68	$87.98	$123.70	$112.32	$5,831.89
Travel Company	531	ENG-Engineering Stage	1	1	4		39	$87.98	$123.70	$64.65	$276.33
Travel Company	650/651	CUC-Cisco Unity Connection	3	1	4		251	$87.98	$123.70	$413.79	$1,876.40
Travel Company	651/660/661	G4M-G4Meta	1	1	4		39	$87.98	$123.70	$64.65	$276.33
Travel Company	680	G4C-G4Connect DR	1	1	4		74	$87.98	$123.70	$122.40	$334.08
Travel Company	683	Pitney Bowes Packaging Tracking	1	1	4		94	$87.98	$123.70	$155.40	$367.08
Travel Company	686	PRX-Proxy DR	41	1	4		77	$87.98	$123.70	$127.81	$13,919.07
Travel Company	690	INT-Integration (IN1 and IN2)	3	1	4		115	$87.98	$123.70	$189.49	$1,203.49
			200	1	4		73	$87.98	$123.70	$119.92	$66,320.24
		NEX-Nexus	3	1	6		190	$87.98	$185.55	$312.70	$1,758.70
Travel Company	513	MER-Merlot	1	1	8		63	$87.98	$247.41	$104.25	$439.63
Travel Company	686	NTB-Netbrain	4	1	8		79	$87.98	$247.41	$130.92	$1,865.22
Travel Company	690	INT-Integration (IN1 and IN2)	2	1	8		48	$87.98	$247.41	$79.52	$829.81
			18	1	8		85	$87.98	$247.41	$140.91	$8,573.33

Cost Parameters

Description	Storage	CPU	RAM	All-Flash	Misc
	Hybrid			All-Flash	
SSD	3.25	36	1024	19.32	
HDD	21.25			0	
Total Server Cost	$ 35,000			$ 90,000	
Compute & RAM	$ 17,000			$ 17,000	
Storage Cost Factor	$ 18,000			$ 73,000	
License	$ 25,000			$ 25,000	
Racking Unit Cost	$ 3,000			$ 3,000	
Cost	$ 63,000			$ 118,000	
Relative Cost Factor	0.51	0.15	0.34	0.81	
Commit Ratio	% 80	% 300	% 70	% 80	
Cost/GB/GB/Core	$ 1.65	$ 85.00	$ 29.88	$ 4.13	
Reimbursement	$ 32,400.00	$ 9,180.00	$ 21,420.00	$ 95,711.11	
Labor Ratio	% 10	% 15	% 15	Storage Factors	
Uplift Ratio	% 20	% 20	% 20	Non-Replicated	% 100
Tier-1 Threshold		4	32	Replicated	% 200
Tier-1 Ratio		% 75	% 75		
Tier-2 Threshold		8	128		
Tier-2 Ratio		% 150	% 150		
Tier-3 Threshold		16	256		
Tier-3 Ratio		% 300	% 200		
Tier-4 Threshold		>= 17	>= 257		
Tier-4 Ratio		% 1000	% 300		

Refresh

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Asset Management Introduction

These are some of the day-to-day and monthly asset management tasks that can be addressed by leveraging the reports in this catalog. Here are some of the objectives met by this section:

- Asset management overview
- Asset utilization
- Retired assets
- Request fulfillment
- Environment analysis

* Any modifications to the Data Dictionary for the reports shown will require a custom report.

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6.1 Cloud Analysis (Page 1 of 5)

Description: This dashboard contains multiple pages of data showing an analysis of as-is virtual infrastructure vs optimized virtual infrastructure. Costs savings is emphasized by re-tiering or re-sizing virtual machines based on AWS Standard Configuration parameters. The idea is to determine which resources would benefit from cost savings by remaining on-prem vs migrating to the AWS Cloud.

Prerequisites: Annotations/definitions are necessary for Applications. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.

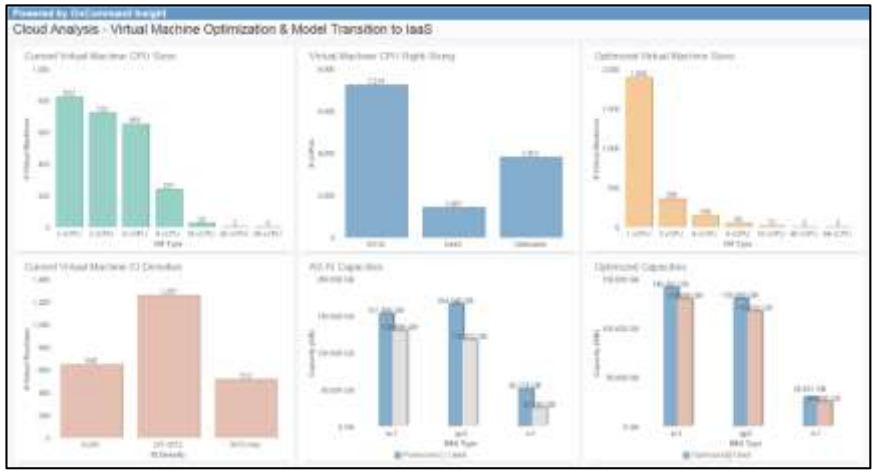
Data Dictionary

See next page

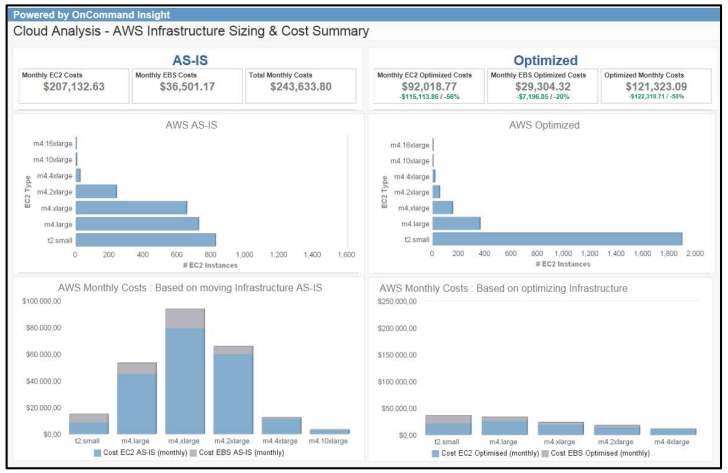
☐ Select This Report

Cloud Analysis – Page 1

Cloud Analysis – Page 2



Cloud Analysis – Page 3



Click on the report screen shots above to view an enlarged image.

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6.1 Cloud Analysis (Page 2 of 5)

Field	Description
Application	OCI configured annotation. Defines the tenant application with a host or internal volume.
VM Instance Name	Name of the Virtual Machine monitored by OCI.
OS	Name of the operating system associated with the virtual machine.
Cores	Number of CPU cores allocated to a virtual machine.
Memory(GB)	Amount of RAM allocated to a virtual machine.
Provisioned Capacity(GB)	Amount of capacity in GB provisioned to the VMDK associated with a virtual machine.
provGB	Same as above.
Used Capacity(GB)	Amount of used capacity in GB provisioned to the VMDK associated with a virtual machine. If capacity is thick provisioned, then used will equal to allocated.
Used GB	Same as above.
Monthly Cost Chart Axis Range	The result of the axisThreshold parameter associated with Cost Charts Axis Threshold input at runtime. Sets the axis threshold for Cost charts. Default is 250,000.
EC2 Axis Threshold	The result of the EC2chartAxisThreshold parameter associated with EC2 Charts Axis Threshold input at runtime. Sets the axis threshold for EC2 Charts. Default is 1600.
Order Configured	Sets the order of the Configured EC2 results for charts. t2.small is 0 up to m4.16xlarge is equal to 6.
Configured EC2	AWS 'As-Configured' Standard for EC2 : Cores = 1 THEN t2.small Cores <= 2 THEN m4.large Cores <= 4 THEN m4.xlarge Cores <=8 THEN m4.2xlarge Cores <=16 THEN m4.4xlarge Cores <=40 THEN m4.10xlarge ELSE m4.16xlarge

Data Dictionary

Field	Description
AS-IS EC2 Type	Same as Configured EC2.
Configured EBS	Equal to 'gp2'.
Max IOPS	Peak Hourly IOpS as reported by the virtual machine over 14 days.
Max Throughput	Peak Hourly Throughput in MB/second as reported by the virtual machine over 14 days.
Max of avg CPU	Peak Hourly CPU Utilization % as reported by the virtual machine over 14 days.
Max of avg MEM	Peak Hourly Memory Utilization % as reported by the virtual machine over 14 days.
Used Cores	Max of avg CPU * Cores
Used Memory	Max of avg MEM * Memory(GB)
IOPS 95th	The 95th percentile says that 95% of the time, the usage is at or below this amount. Conversely, 5% of the samples may be bursting above this rate but are ignored. 95th Percentile of IOpS Formula: CAST(SUBSTRING_INDEX(SUBSTRING_INDEX(GROUP_CONCAT(pf.totalIopsMax ORDER BY pf.totalIopsMax SEPARATOR ','), ',', 95/100 * COUNT(*) + 1), ',', -1) AS DECIMAL)
IOD 95th	95th Percentile of IO Density (IOpS/TB) CAST(SUBSTRING_INDEX(SUBSTRING_INDEX(GROUP_CONCAT(pf.totalIopsMax ORDER BY pf.totalIopsMax SEPARATOR ','), ',', 95/100 * COUNT(*) + 1), ',', -1) AS DECIMAL)/(hvvm.usedCapacityMB/1048576)

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6.1 Cloud Analysis (Page 3 of 5)

Field	Description
Optimized MEM(GB)	Amount of RAM memory allocated to the virtual machine.
Order-optimized	
optCPU	OCI/Cognos configured parameter/variable. Optimized CPU % variable input at run-time. Default is .80 or 80%.

Optimized CPU	IF(MAX of avg CPU is null THEN Cores,
	IF(MAX of avg CPU > 0.9 THEN Cores+1,
	ELSE
	CEIL((Cores * MAX of avg CPU) / optCPU))
	NOTE: MySQL CEIL() function returns the smallest integer value not less than the number specified as an argument.

Optimized EC2 Type	Optimized EC2 Type is based on the Optimized CPU value above and the Configured EC2 field.
capTop	OCI/Cognos configured parameter/variable input at run-time. Optimized capacity threshold for TOP Used %. Default is .75 or 75%.
capBottom	OCI/Cognos configured parameter/variable input at run-time. Optimized bottom used capacity threshold in (GB). Default is 7.5 GB.
Optimized Capacity	CASE WHEN (usedGB / provGB) > capTop THEN CEIL(provGB) WHEN usedGB <= capBottom THEN 10 ELSE CEIL(usedGB / capTop) END
sc10ptEBS	OCI/Cognos configured parameter/variable input at run-time. IO Density requirements for EBS sc1. Default is <=256.
gp2OptEBS	OCI/Cognos configured parameter/variable input at run-time. IO Density requirements for EBS gp2. Default is <=3072.
io10ptEBS	OCI/Cognos configured parameter/variable input at run-time. IO Density requirements for EBS io1. Default is any value greater than 3072.

Data Dictionary

Field	Description
Optimized EBS Type	Optimized EBS formula based on user input values above. CASE WHEN IOD 95th IS NULL THEN 'sc1' WHEN IOD 95th <= sc1OptEBS THEN 'sc1' WHEN IOD 95th <= gp2OptEBS THEN 'gp2' WHEN IOD 95th io1OptEBS THEN 'io1' ELSE 'NULL'
Cost EC2 AS-IS (monthly)	Based on the AS-IS EC2 Type and configured parameter/variables input at run-time. Defaults are configured as follows: WINDOWS Type='t2.small' and variable is t2smallWindows = $17.16 Type='m4.large' and variable is m4largeWindows = $108.92 Type='m4.xlarge' and variable is m4xlargeWindows = $217.91 Type='m4.2xlarge' and variable is m42xlargeWindows = $435.81 Type='m4.4xlarge' and variable is m44xlargeWindows = $871.55 Type='m4.10xlarge' and variable is m410xlargeWindows = $2178.90 Type='m4.16xlarge' and variable is m416xlargeWindows = $3486.26 LINUX t2smallLinux = $10.44 m4largeLinux = $41.76 m4xlargeLinux = $83.59 m42xlargeLinux = $167.17 m44xlargeLinux = $334.27 m410xlargeLinux = $835.70 m416xlargeLinux = $1337.14

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6.1 Cloud Analysis (Page 4 of 5)

Field	Description
Cost EBS AS-IS (monthly)	Based on the Configured EBS Type and configured parameter/variables input at run-time. Defaults are configured as follows: WHEN Configured EBS = 'gp2' THEN gp2 * Provisioned Capacity(GB) WHEN Configured EBS = 'sc1' THEN sc1 * Provisioned Capacity(GB) WHEN Configured EBS = 'io1' THEN io1 * Provisioned Capacity(GB) + io1iops * IOPS 95th ELSE 0
Cost AS-IS (monthly)	Cost EC2 AS-IS (monthly) – Cost EBS AS-IS (monthly)
Cost EC2 Optimized (monthly)	Based on the Optimized EC2 Type field and follows the same cost structure as Cost EC2 AS-IS (monthly) above.
Cost EBS Optimized (monthly)	Based on the Optimized EBS Type field and configured parameter/variables input at run-time. Defaults are configured as follows: WHEN Configured EBS = 'gp2' THEN gp2 * Optimized Capacity WHEN Configured EBS = 'sc1' THEN sc1 * Optimized Capacity WHEN Configured EBS = 'io1' THEN io1 Optimized Capacity + io1iops * IOPS 95th ELSE 0
Cost Optimized (monthly)	Cost EBS Optimized (monthly) + Cost EC2 Optimized (monthly)
Cost EC2 Delta (monthly)	Cost EC2 Optimized (monthly) – Cost EC2 AS-IS (monthly)
Cost EBS Delta (monthly)	Cost EBS Optimized (monthly) – Cost EBS AS-IS (monthly)
Cost Delta (monthly)	Cost Optimized (monthly) – Cost AS-IS (monthly)
Cost Avoid over 3 Years	(Cost Delta (monthly) * -1)*36 / 1000000

Data Dictionary

Field	Description
Total Configured CPU %	Total(Used Cores) / Total(Cores) Note: this is a Cognos Total Function used for custom data items
Total Optimized Memory %	Total(Used Memory) / Total (Optimized MEM(GB))
Total Optimized Storage %	Total(Used Capacity(GB)) / Total(Optimized Capacity)
Count as-is	Number of virtual machines by configuration for as-is criteria.
Count optimized	Number of virtual machines by configuration for optimized criteria.
Count AS-IS Cores	[Count as-is t2.small]+([Count as-is m4.large]*2)+([Count as-is m4.xlarge]*4)+([Count as-is m4.2xlarge]*8)+([Count as-is m4.4xlarge]*16)+([Count as-is m4.10xlarge]*40)+([Count as-is m4.16xlarge]*64)
Count Optimized Cores	[Count optimised t2.small]+([Count optimised m4.large]*2)+([Count optimised m4.xlarge]*4)+([Count optimised m4.2xlarge]*8)+([Count optimised m4.4xlarge]*16)+([Count optimised m4.10xlarge]*40)+([Count optimised m4.16xlarge]*64)
Reduction in X-Large VM %	(([Count as-is m4.16xlarge]+[Count as-is m4.10xlarge]+[Count as-is m4.4xlarge]+[Count as-is m4.2xlarge]+[Count as-is m4.xlarge]) – ([Count optimised m4.16xlarge]+[Count optimised m4.10xlarge]+[Count optimised m4.4xlarge]+[Count optimised m4.2xlarge]+[Count optimised m4.xlarge])) / ([Count as-is m4.16xlarge]+[Count as-is m4.10xlarge]+[Count as-is m4.4xlarge]+[Count as-is m4.2xlarge]+[Count as-is m4.xlarge]+[Count as-is m4.large]+[Count as-is t2.small])

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6.1 Cloud Analysis (Page 5 of 5)

Field	Description
Count AS-IS Mem Util	Count of AS-IS Memory Utilization for values 10% through 100% at increments of 10. There are 10 separate data items with the following formula (substitute .1 with the appropriate increment) If (Max of avg MEM < .1) THEN (1) ELSE (0) A Cognos aggregation will provide the sum of the value when the condition is met.
Count AS-IS IOD	Count of AS-IS IO Density for values 256, 3072 and greater than 3072. IF (IOD 95th < 257) THEN (1) ELSE (0) A Cognos aggregation will provide the sum of the value when the condition is met.
Count AS-IS CPU Util	Count of AS-IS CPU Utilization for values 10% through 100% at increments of 10. There are 10 separate data items with the following formula (substitute .1 with the appropriate increment) If (Max of avg CPU < .1) THEN (1) ELSE (0) A Cognos aggregation will provide the sum of the value when the condition is met.

Data Dictionary

Field	Description
VMs Less Than 40% CPU usage at Peak	([Count AS-IS CPU Util 10]+[Count AS-IS CPU Util 20]+[Count AS-IS CPU Util 30]+[Count AS-IS CPU Util 40]) / ([Count AS-IS CPU Util 10]+[Count AS-IS CPU Util 20]+[Count AS-IS CPU Util 30]+[Count AS-IS CPU Util 40]+[Count AS-IS CPU Util 50]+[Count AS-IS CPU Util 60]+[Count AS-IS CPU Util 70]+[Count AS-IS CPU Util 80]+[Count AS-IS CPU Util 90]+[Count AS-IS CPU Util 100])
Chart Top Range	Monthly Cost Chart Axis Range
EC2 Axis	EC2 Axis Threshold
EC2 Cost Delta %	Total (Cost EC2 Delta (monthly)) / Total(Cost EC2 AS-IS (monthly))
EBS Cost Delta %	Total(Cost EBS Delta (monthly)) / Total(Cost EBS AS-IS (monthly))
Cost Delta %	Total(Cost Delta (monthly)) / Total(Cost AS-IS (monthly))
Cost Avoid %	Cost Delta % * 100 * -1

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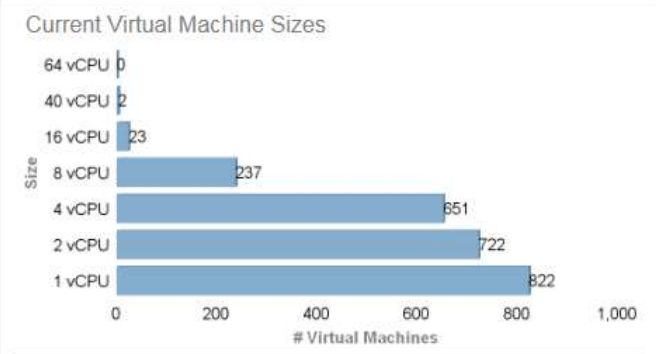
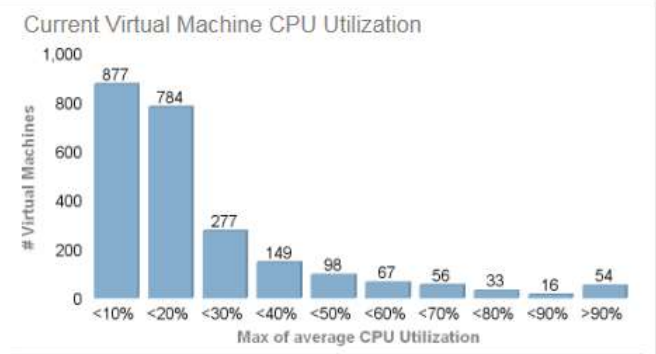
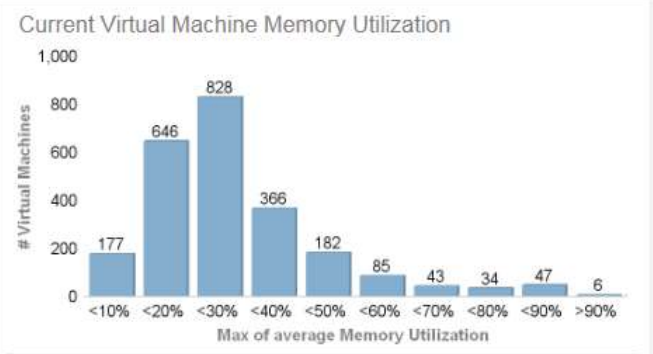
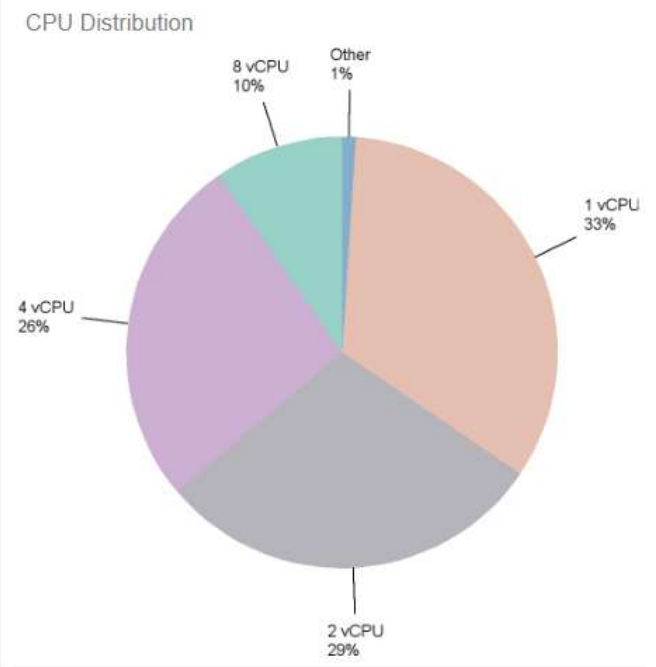
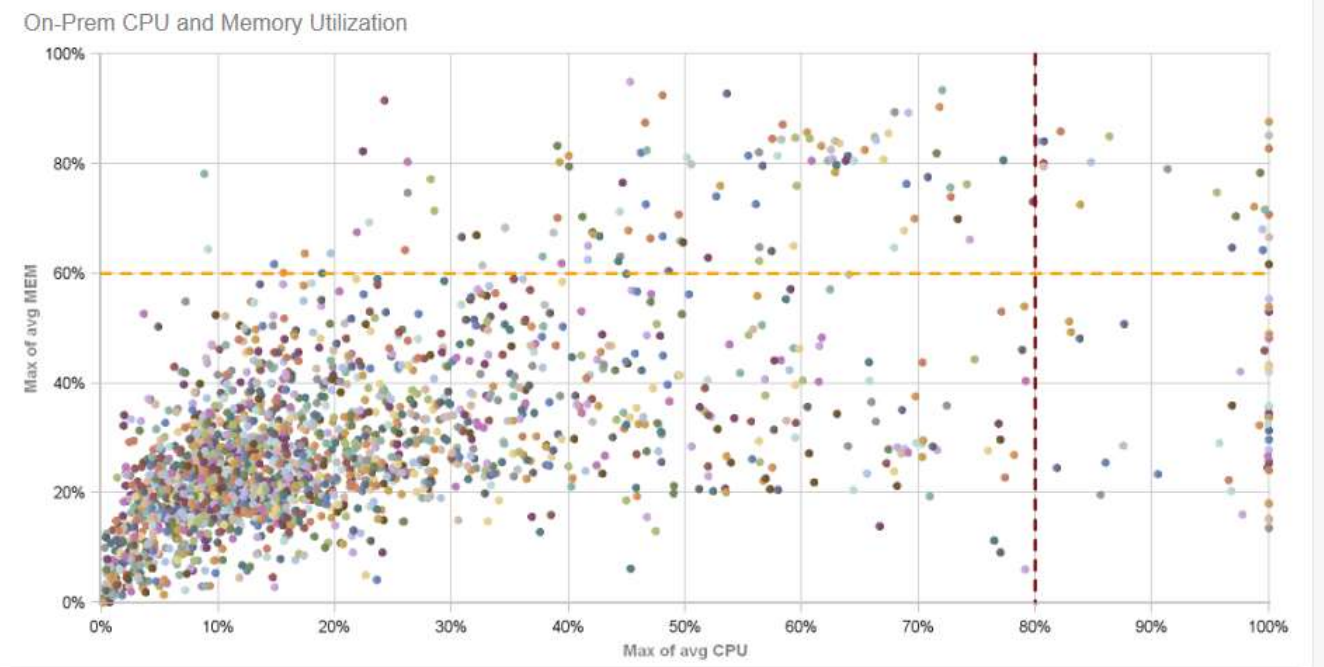
Cloud Analysis - Current Virtual Machine Status











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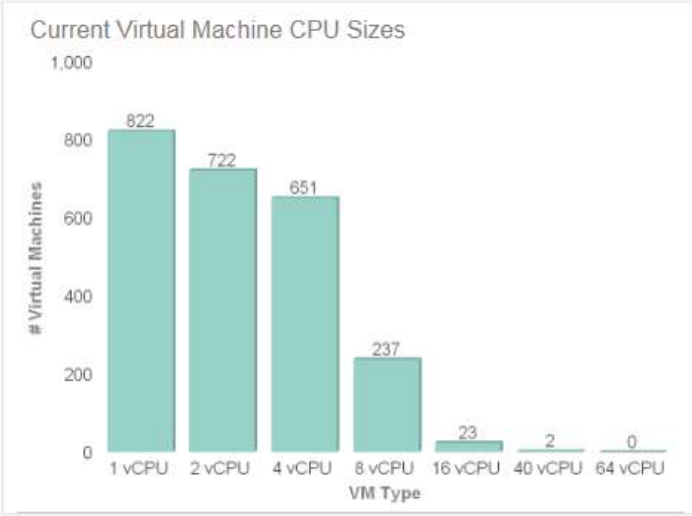
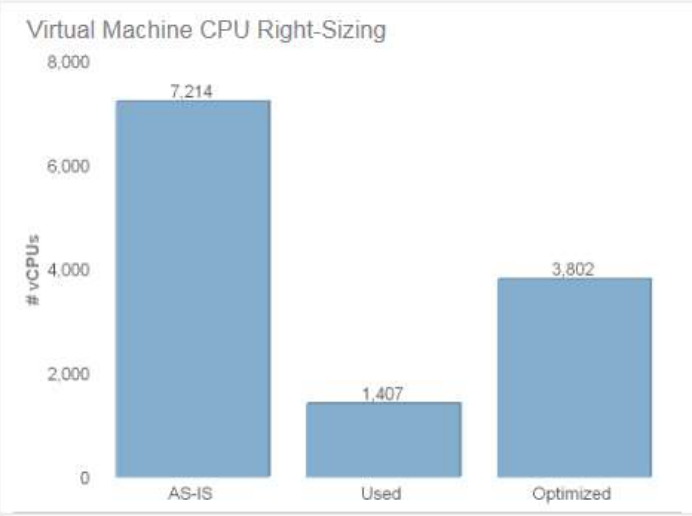
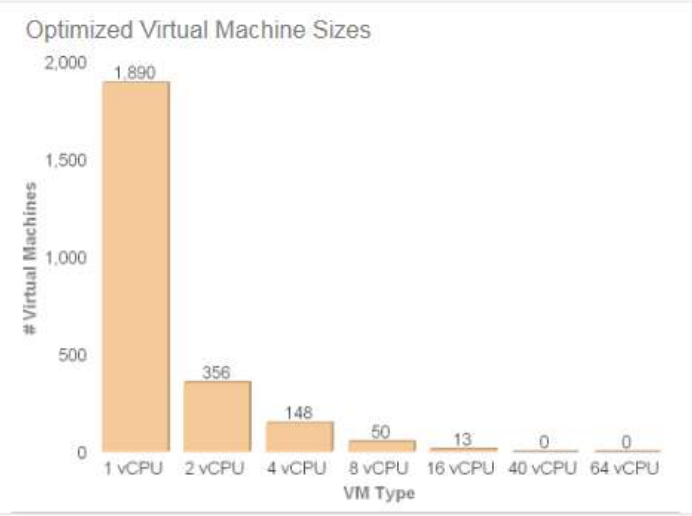
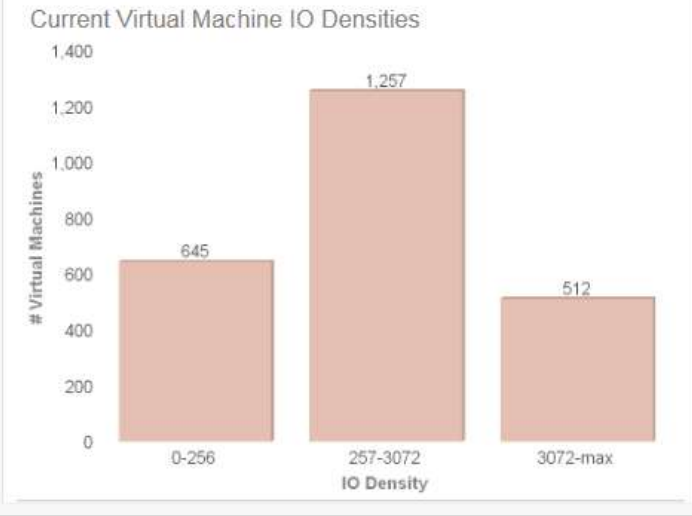
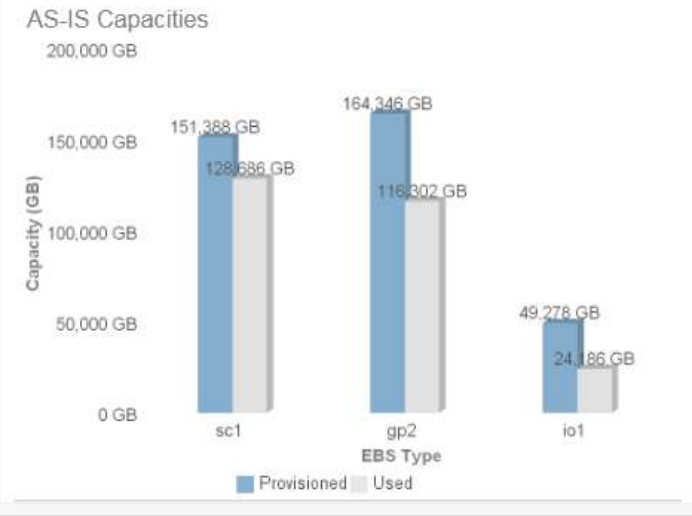
Cloud Analysis - Virtual Machine Optimization & Model Transition to IaaS

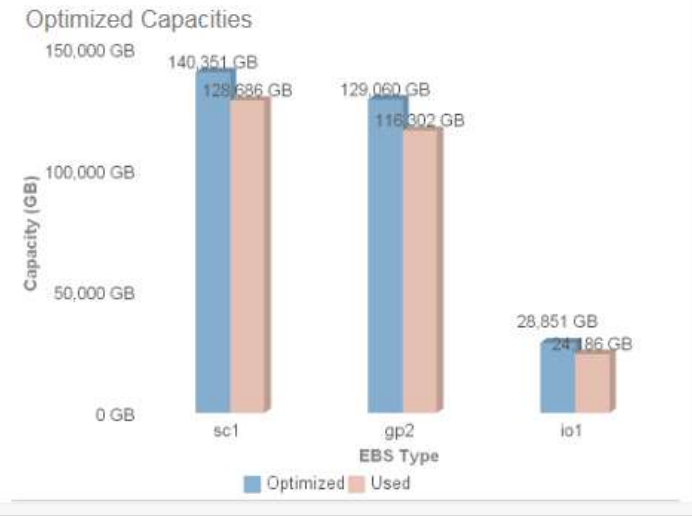












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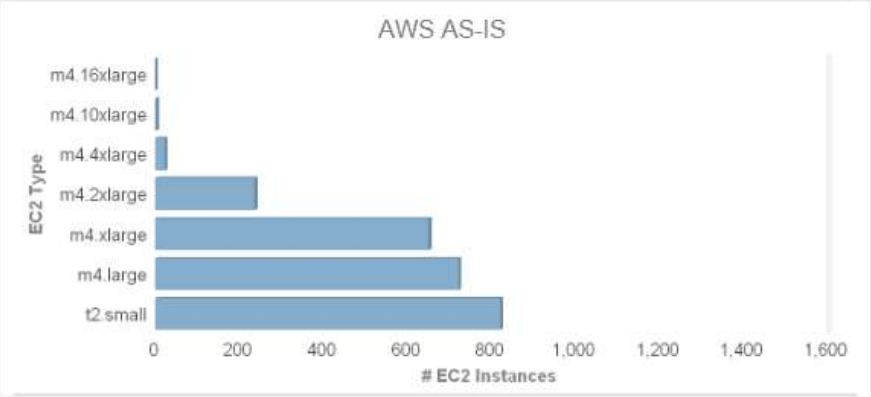
Cloud Analysis - AWS Infrastructure Sizing & Cost Summary

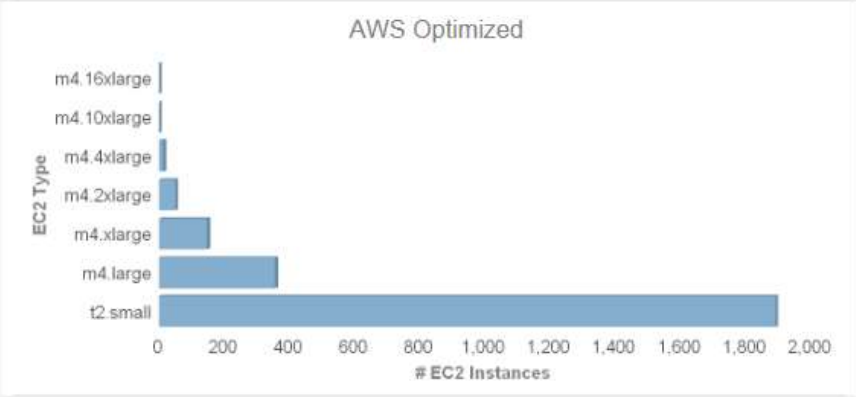
AS-IS

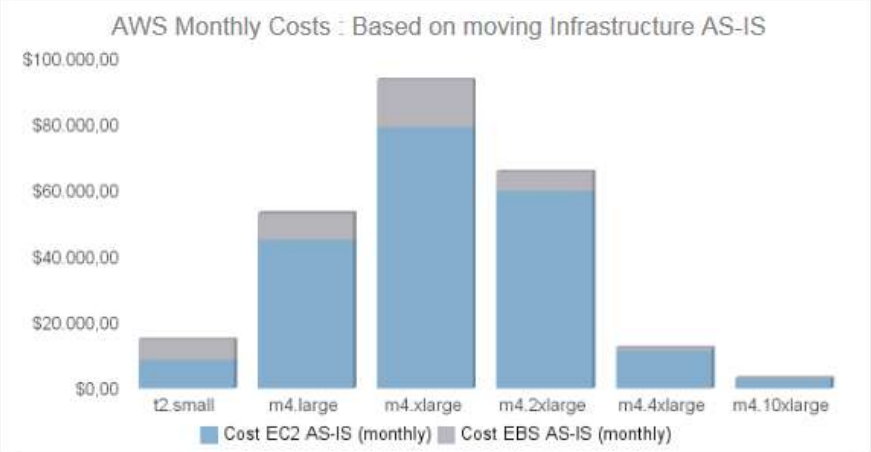
Monthly EC2 Costs	Monthly EBS Costs	Total Monthly Costs
$207,132.63	$36,501.17	$243,633.80

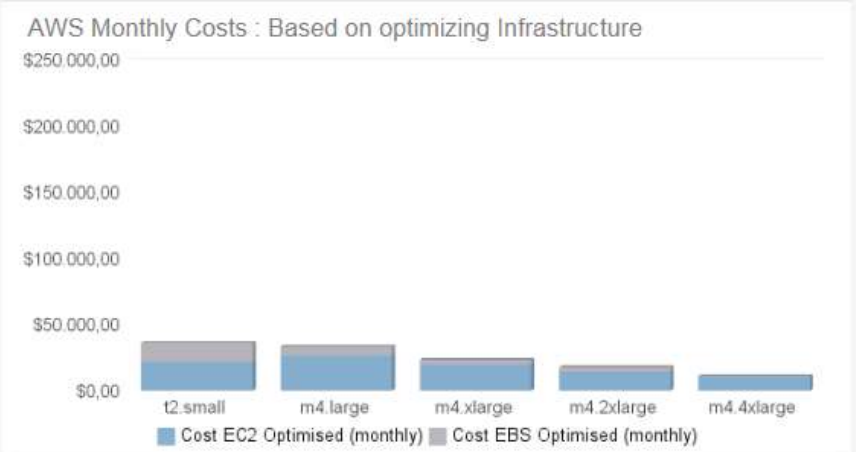
Optimized

Monthly EC2 Optimized Costs	Monthly EBS Optimized Costs	Optimized Monthly Costs
$92,018.77 -$115,113.86 / -56%	$29,304.32 -$7,196.85 / -20%	$121,323.09 -$122,310.71 / -50%









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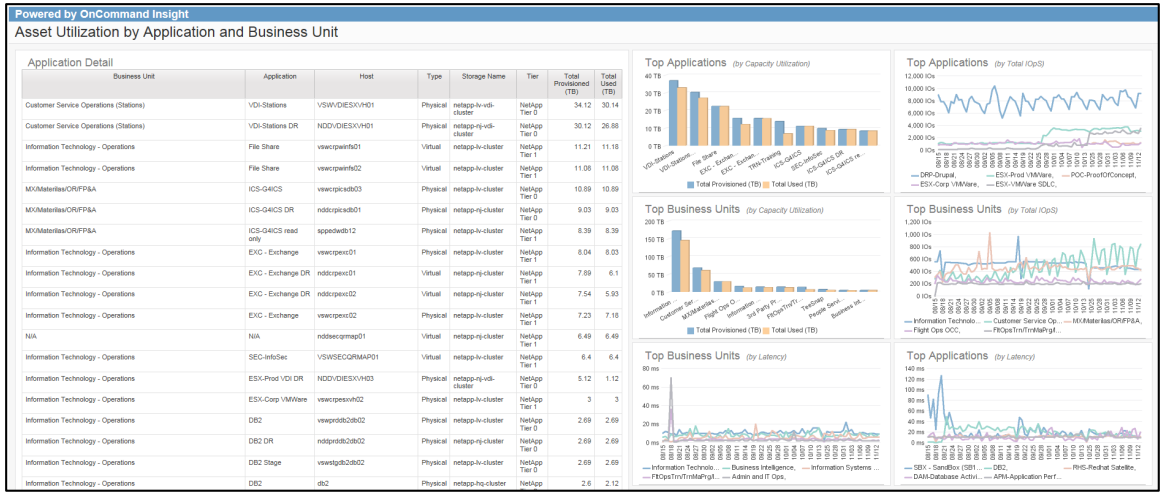
6.2 Asset Utilization by Application and Business Unit

Description: This report shows Asset (Storage) Utilization grouped by Application, Organization (Business Unit), and Tier. Provisioned and Used Capacity are shown for each Asset including both physical and virtual hosts. On the right of the dashboard are two charts showing Top Application Utilization and Top Business Unit Utilization. The charts in the final section on the right show the Top Applications and Business Unit by IOpS, Latency, and Throughput.

Prerequisites: Annotations/definitions are necessary for costs, Application, Business Unit, and Service Level/Tier. Requires secondary ETL script to run nightly. There is a Non-ETL version as well. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Application	OCI configured annotation. Defines the application assigned to hosts or internal volumes.
Business Unit	OCI configured annotation. Defines business units or owners of resources assigned to hosts or internal volumes.
Tier	OCI configured annotation. Defines tiers of storage based on disk type, disk speed, etc.
Host	Name of the physical or virtual host monitored by OCI.
Type	Type of host. (e.g. virtual or physical)
Storage Name	Name of the storage array discovered by OCI.
Tier	OCI configured annotation. Defines tiers of storage based on disk type, disk speed, etc.
Total Provisioned (TB)	Internal Volume or Volume/LUN capacity allocated to host initiators that are annotated with Business Unit or Application.
Total Used (TB)	For Internal Volumes that are not LUNS and with Space Guarantee disabled, this is written capacity grouped by Application or Business Unit. For Internal Volumes with Space Guarantee enabled and for LUNs, used capacity will be equal to allocated.
Total IOpS	Sum of Average IOpS (both read and write) averaged daily for past 90 days.
Latency	Average Latency in milliseconds for past 90 days.
Date	OCI configured annotation. Defines the application assigned to hosts or internal volumes.

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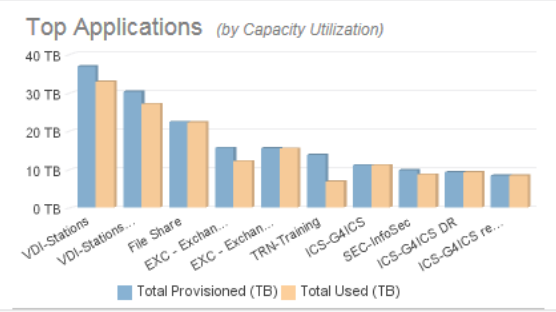
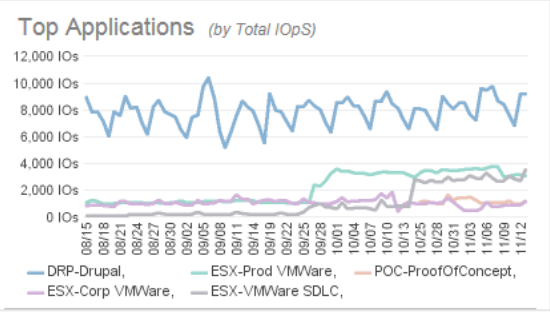
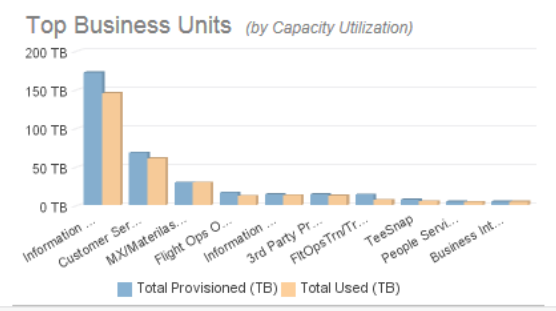
Asset Utilization by Application and Business Unit

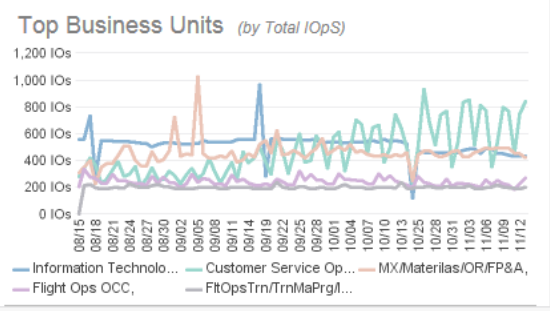
Application Detail

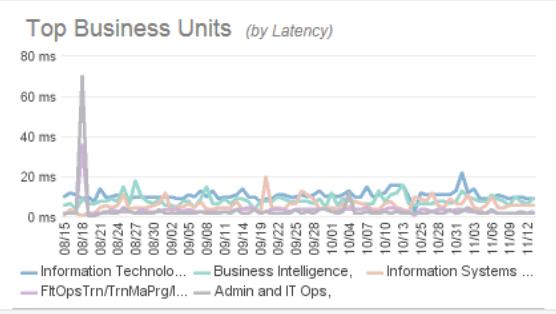
Business Unit	Application	Host	Type	Storage Name	Tier	Total Provisioned (TB)	Total Used (TB)
Customer Service Operations (Stations)	VDI-Stations	VSWVDIESXVH01	Physical	netapp-lv-vdi-cluster	NetApp Tier 0	34.12	30.14
Customer Service Operations (Stations)	VDI-Stations DR	NDDVDIESXVH01	Physical	netapp-nj-vdi-cluster	NetApp Tier 0	30.12	26.88
Information Technology - Operations	File Share	vswcrpwinfs01	Virtual	netapp-lv-cluster	NetApp Tier 1	11.21	11.18
Information Technology - Operations	File Share	vswcrpwinfs02	Virtual	netapp-lv-cluster	NetApp Tier 1	11.08	11.08
MX/Materilas/OR/FP&A	ICS-G4ICS	vswcrpicsdb03	Physical	netapp-lv-cluster	NetApp Tier 0	10.89	10.89
MX/Materilas/OR/FP&A	ICS-G4ICS DR	nddcrpicsdb01	Physical	netapp-nj-cluster	NetApp Tier 0	9.03	9.03
MX/Materilas/OR/FP&A	ICS-G4ICS read only	sppedwdb12	Physical	netapp-lv-cluster	NetApp Tier 1	8.39	8.39
Information Technology - Operations	EXC - Exchange	vswcrpexc01	Physical	netapp-lv-cluster	NetApp Tier 1	8.04	8.03
Information Technology - Operations	EXC - Exchange DR	nddcrpexc01	Virtual	netapp-nj-cluster	NetApp Tier 1	7.89	6.1
Information Technology - Operations	EXC - Exchange DR	nddcrpexc02	Virtual	netapp-nj-cluster	NetApp Tier 1	7.54	5.93
Information Technology - Operations	EXC - Exchange	vswcrpexc02	Physical	netapp-lv-cluster	NetApp Tier 1	7.23	7.18
N/A	N/A	nddsecqrmap01	Virtual	netapp-nj-cluster	NetApp Tier 1	6.49	6.49
Information Technology - Operations	SEC-InfoSec	VSWSECQRMAP01	Virtual	netapp-lv-cluster	NetApp Tier 1	6.4	6.4
Information Technology - Operations	ESX-Prod VDI DR	NDDVDIESXVH03	Physical	netapp-nj-vdi-cluster	NetApp Tier 0	5.12	1.12
Information Technology - Operations	ESX-Corp VMWare	vswcrpesxvh02	Physical	netapp-lv-cluster	NetApp Tier 1	3	3
Information Technology - Operations	DB2	vswprddb2db02	Physical	netapp-lv-cluster	NetApp Tier 0	2.69	2.69
Information Technology - Operations	DB2 DR	nddprddb2db02	Physical	netapp-nj-cluster	NetApp Tier 0	2.69	2.69
Information Technology - Operations	DB2 Stage	vswstgdb2db02	Physical	netapp-lv-cluster	NetApp Tier 0	2.69	2.69
Information Technology - Operations	DB2	db2	Physical	netapp-hq-cluster	NetApp	2.6	2.12

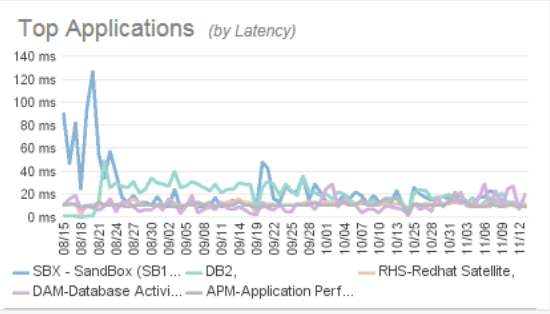












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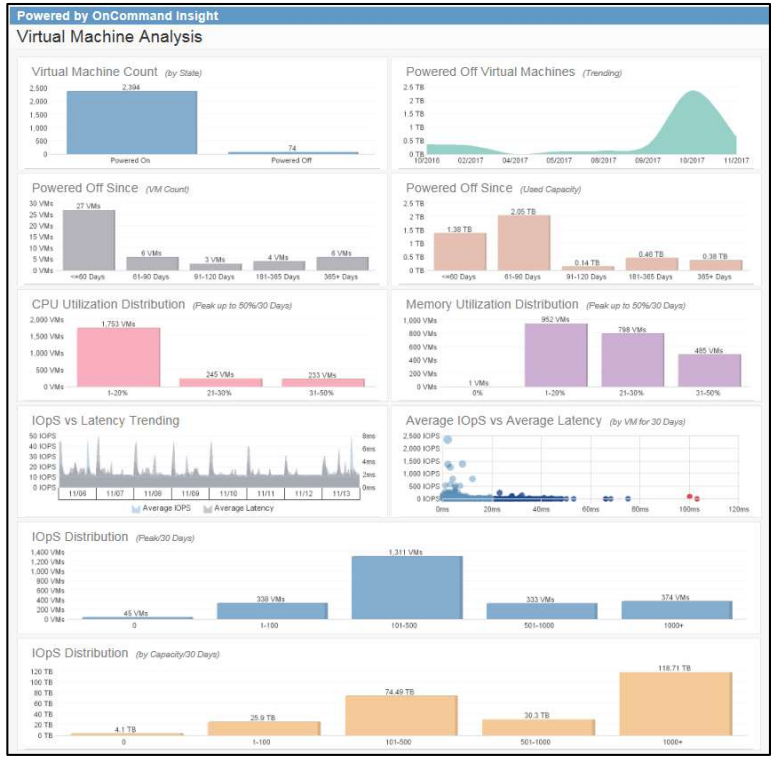
6.3 Virtual Machine Analysis

Description: This dashboard depicts the overall virtual infrastructure and its corresponding health. This quickly gives context as to how much of the environment is potentially reclaimable in terms of Capacity, vCPU, and Memory. It provides a view into an overall distribution of each individual virtual machine's performance in terms of Peak IOpS.

Prerequisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
State	The Virtual Machine State. E.g. Powered On, Powered Off, Suspended.
Powered Off Since	The number of days elapsed since the VM was powered off.
Used Capacity TB	Amount of space actually used by the Virtual Machine. VM Used Capacity in TB shows the space actually occupied by the virtual machine files (Config Files, Log files, VMDK & Snapshots, etc.) in the Virtual Machine Directory.
CPU Utilization Distribution	Virtual Machine CPU Utilization %.
Memory Utilization	Virtual Machine RAM Memory Utilization %.
IOpS	Total IOpS (both read and write) averaged daily for past 30 days.
Latency	Total Response Time in milliseconds (both read and write) averaged daily for past 30 days.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.

Click on the report screen shot above to view an enlarged image.

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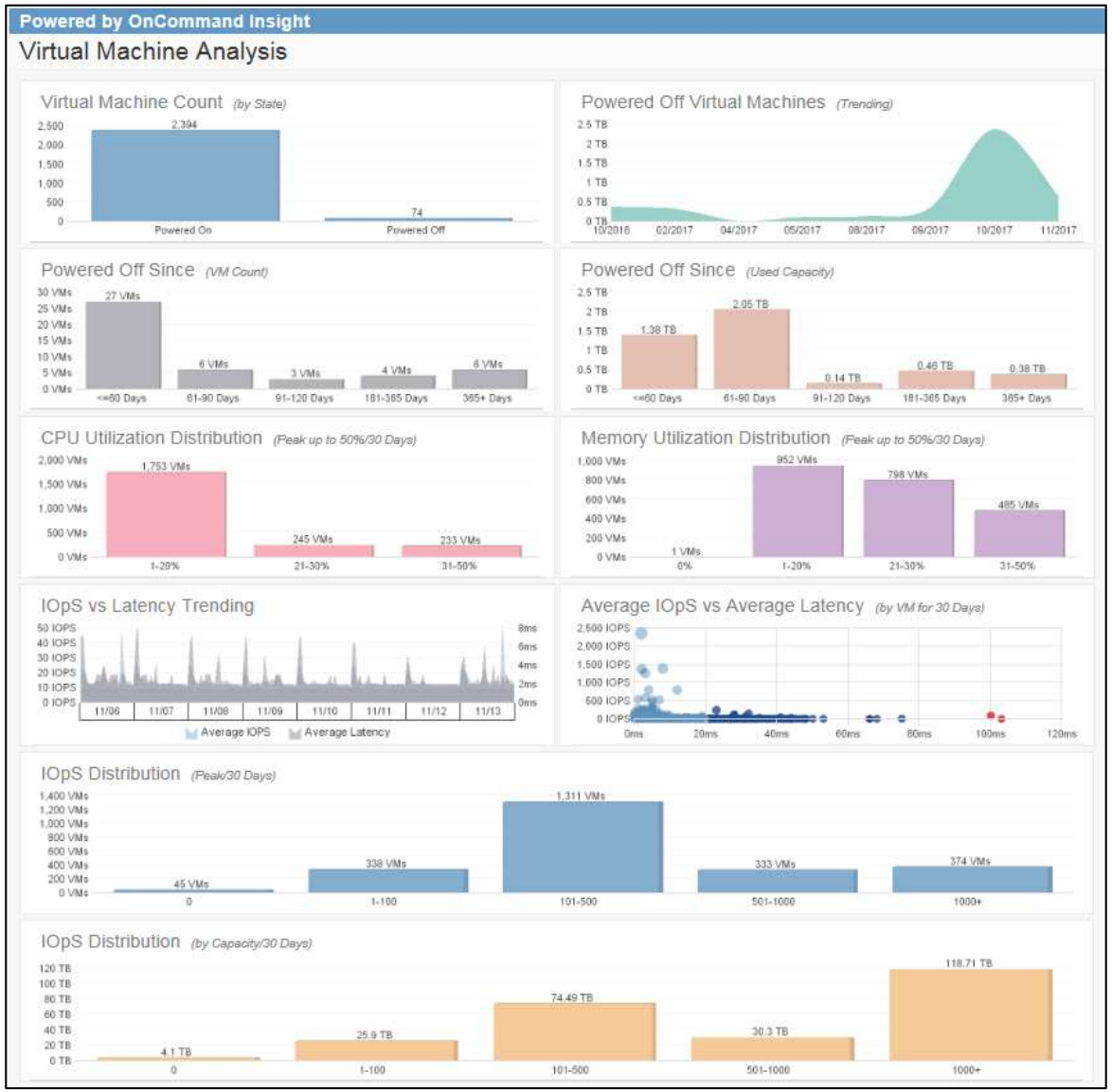

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6.4 Thin-on-Thin – Risk Management (Page 1 of 2)

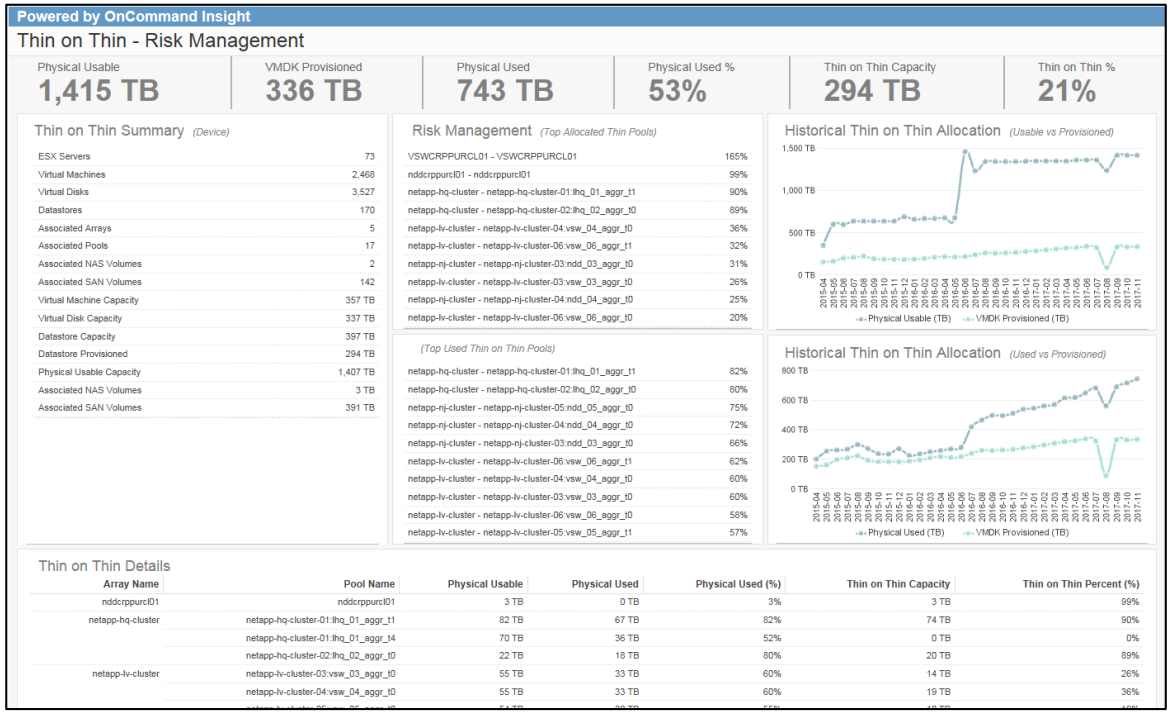
Description: This dashboard shows Thin on Thin in order to mitigate risk. It displays Thin on Thin Summary at top. In the middle, a summary of Capacity, Top Allocated Pools and Historical Trends are available. At the bottom is a list of Thin-on-Thin details.

Prerequisites: This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover and Plan.

Data Dictionary

See Next page

Data Dictionary



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6.4 Thin on Thin – Risk Management (Page 2 of 2)

Field	Description
Pools	Name of the storage pool or aggregate associated with the storage array (or filer) discovered by OCI.
ESX Servers	Total count of Vmware's enterprise server virtualization platform discovered by OCI with a thin on thin configuration.
Virtual Machines	Total count of virtual machines for ALL ESX servers discovered by OCI with a thin on thin configuration.
Virtual Disks	Total count of VMDK's provisioned to virtual machines with a thin on thin configuration.
Datastores	Total count of datastores associated with ESX servers discovered by OCI with a thin on thin configuration.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
Associated Arrays	Total count of storage arrays associated with ESX servers with a thin on thin configuration.
Associated Pools	Total count of storage pools or aggregates with a thin on thin configuration.
Associated NAS Volumes	Total count of NAS volumes associated with ESX servers with a thin on thin configuration.
Associated SAN Volumes	Total count of SAN volumes associated with ESX servers with a thin on thin configuration.
Virtual Machine Capacity TB	Capacity in TB that is provisioned to a virtual machine.

Data Dictionary

☐ **Select This Report**

Field	Description
Virtual Disk Capacity TB	Virtual Disk capacity in TB.
Datastore Capacity TB	SAN or NAS Capacity that is allocated to a Vmware datastore associated with an ESX server discovered by OCI.
Physical Usable Capacity TB	Post-RAID usable capacity in TB as reported by the storage pool associated with the storage array discovered by OCI.
Associated NAS Volumes Capacity TB	Thin allocated capacity in TB for internal volumes (Flexvols).
Associated SAN Volumes Capacity TB	Thin allocated capacity in TB for SAN volumes.
Physical Usable (TB)	Same as Physical Usable Capacity TB.
Physical Used (TB)	Thin provisioned capacity in TB that is written.
Phyisical Used %	Physical Used (TB) / Physical Usable (TB)
Thin on Thin Capacity TB	SUM of dwh_inventory.hv_data_store.provisionedCapacityMB where storage_pool.thinProvisioning is true.
Thin on Thin Percent (%)	Datastore Provisioned Capacity / Volume Capacity
VMDK Provisioned (TB)	Capacity in TB that has been provisioned to VMDKs

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Thin on Thin - Risk Management

Physical Usable	VMDK Provisioned	Physical Used	Physical Used %	Thin on Thin Capacity	Thin on Thin %
1,415 TB	336 TB	743 TB	53%	294 TB	21%

Thin on Thin Summary *(Device)*

ESX Servers	73
Virtual Machines	2,468
Virtual Disks	3,527
Datastores	170
Associated Arrays	5
Associated Pools	17
Associated NAS Volumes	2
Associated SAN Volumes	142
Virtual Machine Capacity	357 TB
Virtual Disk Capacity	337 TB
Datastore Capacity	397 TB
Datastore Provisioned	294 TB
Physical Usable Capacity	1,407 TB
Associated NAS Volumes	3 TB
Associated SAN Volumes	391 TB

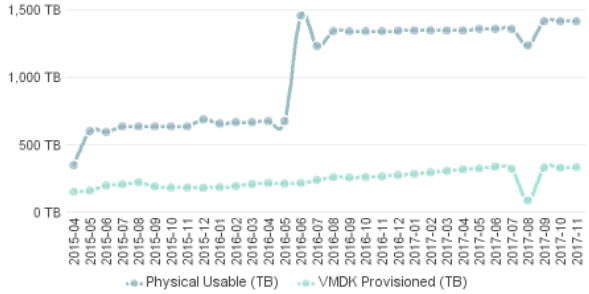
Risk Management *(Top Allocated Thin Pools)*

VSWCRPPURCL01 - VSWCRPPURCL01	165%
nddcrppurcl01 - nddcrppurcl01	99%
netapp-hq-cluster - netapp-hq-cluster-01:lhq_01_aggr_t1	90%
netapp-hq-cluster - netapp-hq-cluster-02:lhq_02_aggr_t0	89%
netapp-lv-cluster - netapp-lv-cluster-04:vsw_04_aggr_t0	36%
netapp-lv-cluster - netapp-lv-cluster-06:vsw_06_aggr_t1	32%
netapp-nj-cluster - netapp-nj-cluster-03:ndd_03_aggr_t0	31%
netapp-lv-cluster - netapp-lv-cluster-03:vsw_03_aggr_t0	26%
netapp-nj-cluster - netapp-nj-cluster-04:ndd_04_aggr_t0	25%
netapp-lv-cluster - netapp-lv-cluster-06:vsw_06_aggr_t0	20%

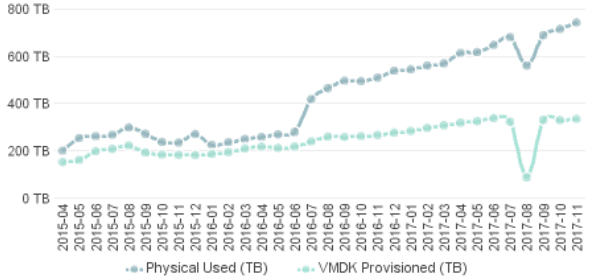
(Top Used Thin on Thin Pools)

netapp-hq-cluster - netapp-hq-cluster-01:lhq_01_aggr_t1	82%
netapp-hq-cluster - netapp-hq-cluster-02:lhq_02_aggr_t0	80%
netapp-nj-cluster - netapp-nj-cluster-05:ndd_05_aggr_t0	75%
netapp-nj-cluster - netapp-nj-cluster-04:ndd_04_aggr_t0	72%
netapp-nj-cluster - netapp-nj-cluster-03:ndd_03_aggr_t0	66%
netapp-lv-cluster - netapp-lv-cluster-06:vsw_06_aggr_t1	62%
netapp-lv-cluster - netapp-lv-cluster-04:vsw_04_aggr_t0	60%
netapp-lv-cluster - netapp-lv-cluster-03:vsw_03_aggr_t0	60%
netapp-lv-cluster - netapp-lv-cluster-06:vsw_06_aggr_t0	58%
netapp-lv-cluster - netapp-lv-cluster-05:vsw_05_aggr_t1	57%

Historical Thin on Thin Allocation *(Usable vs Provisioned)*



Historical Thin on Thin Allocation *(Used vs Provisioned)*



Thin on Thin Details

Array Name	Pool Name	Physical Usable	Physical Used	Physical Used (%)	Thin on Thin Capacity	Thin on Thin Percent (%)
nddcrppurcl01	nddcrppurcl01	3 TB	0 TB	3%	3 TB	99%
netapp-hq-cluster	netapp-hq-cluster-01:lhq_01_aggr_t1	82 TB	67 TB	82%	74 TB	90%
	netapp-hq-cluster-01:lhq_01_aggr_t4	70 TB	36 TB	52%	0 TB	0%
	netapp-hq-cluster-02:lhq_02_aggr_t0	22 TB	18 TB	80%	20 TB	89%
netapp-lv-cluster	netapp-lv-cluster-03:vsw_03_aggr_t0	55 TB	33 TB	60%	14 TB	26%
	netapp-lv-cluster-04:vsw_04_aggr_t0	55 TB	33 TB	60%	19 TB	36%
	netapp-lv-cluster-05:vsw_05_aggr_t0	54 TB	30 TB	55%	19 TB	19%

Click on the screen shot above to return to the report description.

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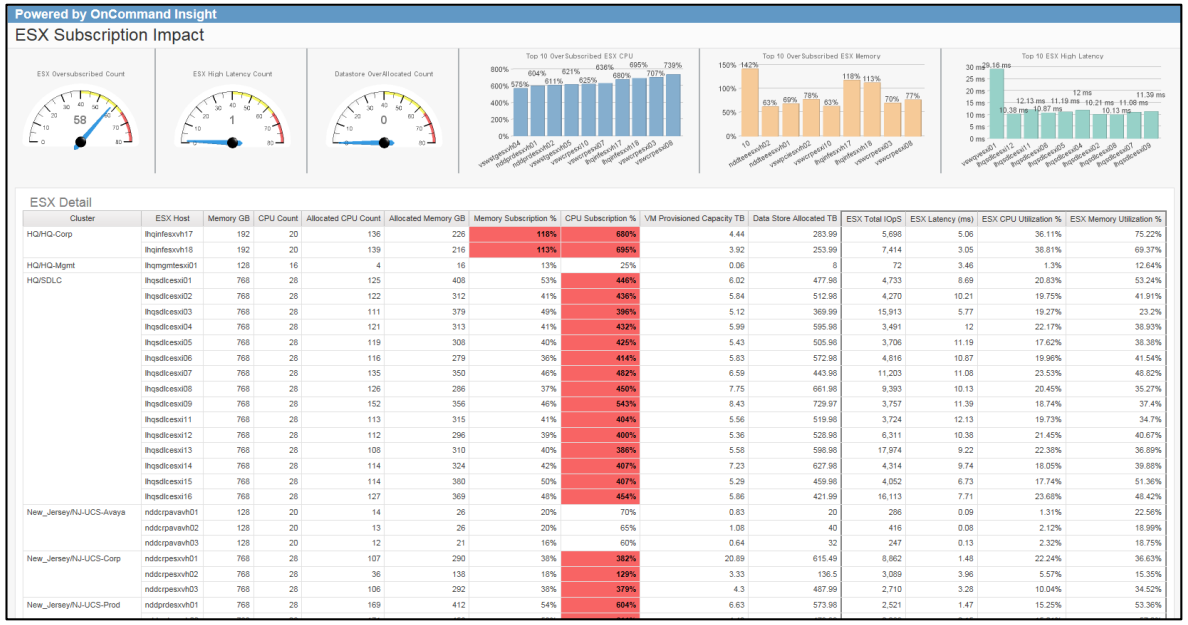
6.5 ESX Subscription Impact

Description: This report shows over-provisioned ESX servers from a memory and CPU perspective. Focus is on the % of Memory and the % of CPU allocated to VM Guests and the potential impact on VM performance.

Prerequisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Cluster	ESX Host	Memory GB	CPU Count	Allocated CPU Count	Allocated Memory GB	Memory Subscription %	CPU Subscription %	VM Provisioned Capacity TB	Data Store Allocated TB	ESX Total IOpS	ESX Latency (ms)	ESX CPU Utilization %	ESX Memory Utilization %
HQ/HQ-Corp	lhqinfesxvh17	192	20	136	226	118%	680%	4.44	283.99	5,698	5.06	36.11%	75.22%
	lhqinfesxvh18	192	20	139	216	113%	695%	3.92	253.99	7,414	3.05	38.81%	69.37%
HQ/HQ-Mgmt	lhqmgmtesxi01	128	16	4	16	13%	25%	0.06	8	72	3.46	1.3%	12.64%
HQ/SDLC	lhqsdlcesxi01	768	28	125	408	53%	446%	6.02	477.98	4,733	8.69	20.83%	53.24%
	lhqsdlcesxi02	768	28	122	312	41%	436%	5.84	512.98	4,270	10.21	19.75%	41.91%
	lhqsdlcesxi03	768	28	111	379	49%	396%	5.12	369.99	15,913	5.77	19.27%	23.2%
	lhqsdlcesxi04	768	28	121	313	41%	432%	5.99	595.98	3,491	12	22.17%	38.93%
	lhqsdlcesxi05	768	28	119	308	40%	425%	5.43	505.98	3,706	11.19	17.62%	38.38%
	lhqsdlcesxi06	768	28	116	279	36%	414%	5.83	572.98	4,816	10.87	19.96%	41.54%
	lhqsdlcesxi07	768	28	135	350	46%	482%	6.59	443.98	11,203	11.08	23.53%	48.82%
	lhqsdlcesxi08	768	28	126	286	37%	450%	7.75	661.98	9,393	10.13	20.45%	35.27%
	lhqsdlcesxi09	768	28	152	356	46%	543%	8.43	729.97	3,757	11.39	18.74%	37.4%
	lhqsdlcesxi11	768	28	113	315	41%	404%	5.56	519.98	3,724	12.13	19.73%	34.7%
	lhqsdlcesxi12	768	28	112	296	39%	400%	5.36	528.98	6,311	10.38	21.45%	40.67%
	lhqsdlcesxi13	768	28	108	310	40%	386%	5.58	598.98	17,974	9.22	22.38%	36.89%
	lhqsdlcesxi14	768	28	114	324	42%	407%	7.23	627.98	4,314	9.74	18.05%	39.88%
	lhqsdlcesxi15	768	28	114	380	50%	407%	5.29	459.98	4,052	6.73	17.74%	51.36%
	lhqsdlcesxi16	768	28	127	369	48%	454%	5.86	421.99	16,113	7.71	23.68%	48.42%
New_Jersey/NJ-UCS-Avaya	nddcrpavavh01	128	20	14	26	20%	70%	0.83	20	286	0.09	1.31%	22.56%
	nddcrpavavh02	128	20	13	26	20%	65%	1.08	40	416	0.08	2.12%	18.99%
	nddcrpavavh03	128	20	12	21	16%	60%	0.64	32	247	0.13	2.32%	18.75%
New_Jersey/NJ-UCS-Corp	nddcrpesxvh01	768	28	107	290	38%	382%	20.89	615.49	8,862	1.48	22.24%	36.63%
	nddcrpesxvh02	768	28	36	138	18%	129%	3.33	136.5	3,089	3.96	5.57%	15.35%
	nddcrpesxvh03	768	28	106	292	38%	379%	4.3	487.99	2,710	3.28	10.04%	34.52%
New_Jersey/NJ-UCS-Prod	nddprdesxvh01	768	28	169	412	54%	604%	6.63	573.98	2,521	1.47	15.25%	53.36%

Data Dictionary

☐ **Select This Report**

Field	Description
Cluster	Name of the ESX Cluster discovered and monitored by OCI.
ESX Host	Name of the ESX Host discovered and monitored by OCI.
Memory GB	ESX RAM memory in GB.
CPU Count	Number of CPUs associated with the ESX Host.
Allocated CPU Count	Number of CPUs allocated to Virtual Machines.
Allocated Memory GB	RAM Memory in GB allocated to Virtual Machines.
Memory Subscription %	Allocated Memory GB / Memory GB
CPU Subscription %	Allocated CPU Count / CPU Count
VM Provisioned Capacity (TB)	Virtual Machine Provisioned Capacity in (TB).
Data Store Allocated (TB)	Capacity Allocated in TB to a Data Store.
ESX Total IOpS	Measures the total number of I/O service requests on the volume during the selected time period (measured in I/O per sec).
ESX Latency	The time it takes from the moment a request for information arrives at the storage device to the time when the storage device begin to send the information back in response. This is the actual latency of the device in milliseconds.
ESX CPU Utilization %	Active CPU Utilization % of the ESX Server.
ESX Memory Utilization %	Active Memory Utilization % of the ESX Server.

Click on the report screen shot above to view an enlarged image.

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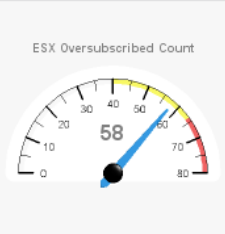
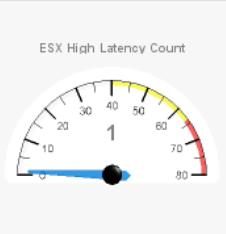
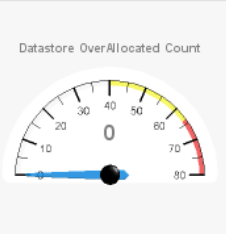
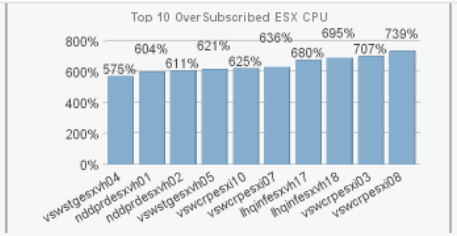
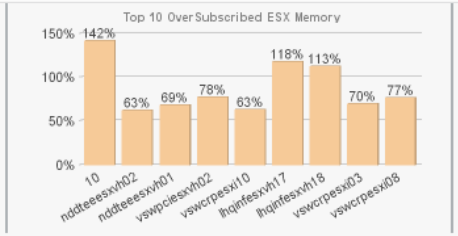
ESX Subscription Impact

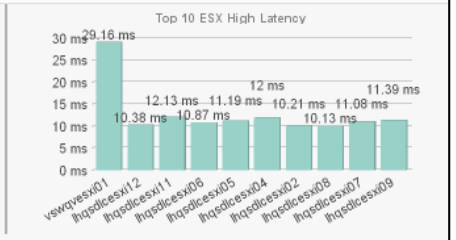












ESX Detail

Cluster	ESX Host	Memory GB	CPU Count	Allocated CPU Count	Allocated Memory GB	Memory Subscription %	CPU Subscription %	VM Provisioned Capacity TB	Data Store Allocated TB	ESX Total IOpS	ESX Latency (ms)	ESX CPU Utilization %	ESX Memory Utilization %
HQ/HQ-Corp	lhqinfesxvh17	192	20	136	226	118%	680%	4.44	283.99	5,698	5.06	36.11%	75.22%
	lhqinfesxvh18	192	20	139	216	113%	695%	3.92	253.99	7,414	3.05	38.81%	69.37%
HQ/HQ-Mgmt	lhqmgmtesxi01	128	16	4	16	13%	25%	0.06	8	72	3.46	1.3%	12.64%
HQ/SDLC	lhqsdlcesxi01	768	28	125	408	53%	446%	6.02	477.98	4,733	8.69	20.83%	53.24%
	lhqsdlcesxi02	768	28	122	312	41%	436%	5.84	512.98	4,270	10.21	19.75%	41.91%
	lhqsdlcesxi03	768	28	111	379	49%	396%	5.12	369.99	15,913	5.77	19.27%	23.2%
	lhqsdlcesxi04	768	28	121	313	41%	432%	5.99	595.98	3,491	12	22.17%	38.93%
	lhqsdlcesxi05	768	28	119	308	40%	425%	5.43	505.98	3,706	11.19	17.62%	38.38%
	lhqsdlcesxi06	768	28	116	279	36%	414%	5.83	572.98	4,816	10.87	19.96%	41.54%
	lhqsdlcesxi07	768	28	135	350	46%	482%	6.59	443.98	11,203	11.08	23.53%	48.82%
	lhqsdlcesxi08	768	28	126	286	37%	450%	7.75	661.98	9,393	10.13	20.45%	35.27%
	lhqsdlcesxi09	768	28	152	356	46%	543%	8.43	729.97	3,757	11.39	18.74%	37.4%
	lhqsdlcesxi11	768	28	113	315	41%	404%	5.56	519.98	3,724	12.13	19.73%	34.7%
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	lhqsdlcesxi14	768	28	114	324	42%	407%	7.23	627.98	4,314	9.74	18.05%	39.88%
	lhqsdlcesxi15	768	28	114	380	50%	407%	5.29	459.98	4,052	6.73	17.74%	51.36%
	lhqsdlcesxi16	768	28	127	369	48%	454%	5.86	421.99	16,113	7.71	23.68%	48.42%
New_Jersey/NJ-UCS-Avaya	nddcrpavavh01	128	20	14	26	20%	70%	0.83	20	286	0.09	1.31%	22.56%
	nddcrpavavh02	128	20	13	26	20%	65%	1.08	40	416	0.08	2.12%	18.99%
	nddcrpavavh03	128	20	12	21	16%	60%	0.64	32	247	0.13	2.32%	18.75%
New_Jersey/NJ-UCS-Corp	nddcrpesxvh01	768	28	107	290	38%	382%	20.89	615.49	8,862	1.48	22.24%	36.63%
	nddcrpesxvh02	768	28	36	138	18%	129%	3.33	136.5	3,089	3.96	5.57%	15.35%
	nddcrpesxvh03	768	28	106	292	38%	379%	4.3	487.99	2,710	3.28	10.04%	34.52%
New_Jersey/NJ-UCS-Prod	nddprdesxvh01	768	28	169	412	54%	604%	6.63	573.98	2,521	1.47	15.25%	53.36%

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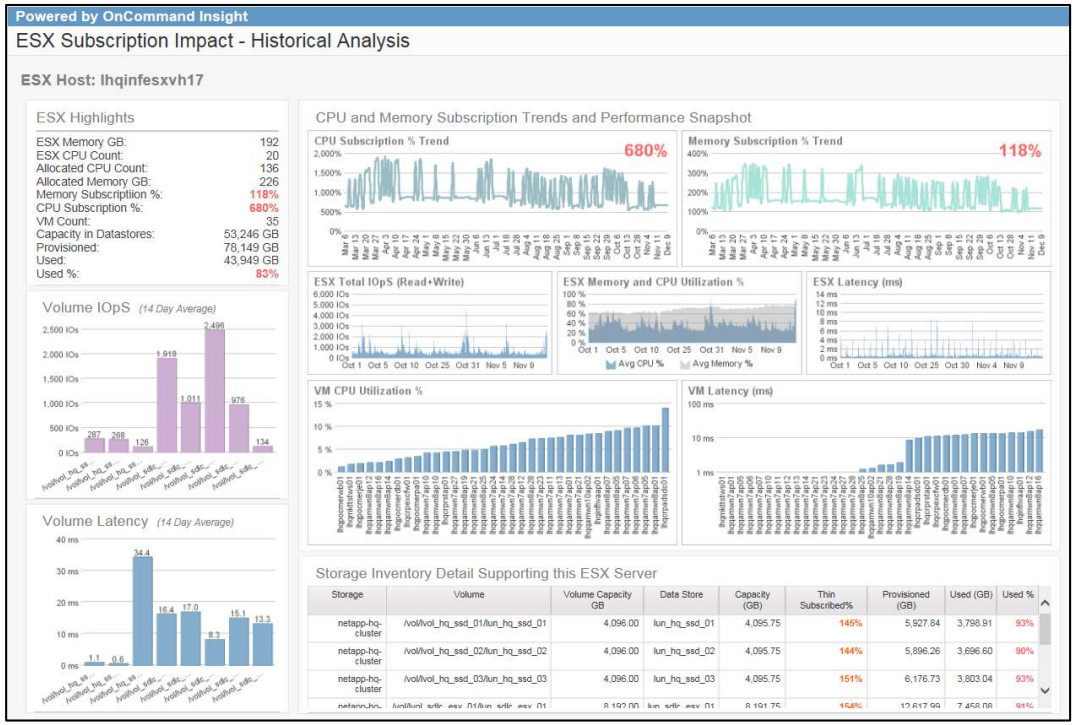
6.6 ESX Subscription Impact – Historical Analysis

Description: This operations level dashboard shows Vmware storage capacity allocation, performance and guest resource subscription details sorted by ESX Server. It will help isolate potential performance bottlenecks based on over-subscribed guest resources like CPU and Memory or backend storage or data stores. CPU and Memory subscription data is derived from the Inventory Data Mart and stored via the secondary ETL for 90 days by default. Records older than 90 days will be purged.

Prerequisites: This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage	Name of the storage array discovered by OCI.
Volume	Name of the volume associated with the storage array discovered by OCI.
ESX Host	Name of the ESX Server discovered by OCI via the Vcenter API.
Data Store	Name of the Data Store associated to the ESX Server.
VM Guest	Name of the VM Guest associated to the ESX Server.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.
ESX Memory Utilization %	Memory Utilization % of the ESX Server averaged hourly for 14 days.
ESX CPU Utilization %	CPU Utilization % of the ESX Server averaged hourly for 14 days.
ESX Total IOpS	Measures the total number of Average TOTAL I/O service requests for the ESX Server (measured in I/O per sec).
ESX Latency (ms)	Total Response Time in milliseconds average hourly for 14 days.
VM CPU Utilization %	CPU utilization for the VM Guest as reported by the Vcenter API.
VM Latency (ms)	Latency in milliseconds for the VM Guest as reported by the Vcenter API.
ESX Memory GB	Total amount of RAM configured within the ESX Server.
ESX CPU Count	Total number of CPU uses configured within the ESX Server.
Allocated CPU Count	The number of CPU's from the ESX Server allocated to VM Guests.
Allocated Memory GB	Total amount of RAM in GB allocated to VM Guests.
Memory Subscription %	Allocated Memory GB / ESX Memory GB.
CPU Subscription %	Allocated CPU Count / ESX CPU Count.
Capacity in Datastores	Total amount of capacity provisioned to Datastores as reported by the Vcenter API.
Provisioned (GB)	Total amount of capacity provisioned to VM Guests from Datastores.
Used (GB)	Total amount of used capacity for VM Guests as reported by the Vcenter API.
Used %	Used (GB) / Provisioned (GB)
Thin Subscribed %	Provisioned (GB) / Capacity in Datastores

 Click on the report screen shot above to view an enlarged image.

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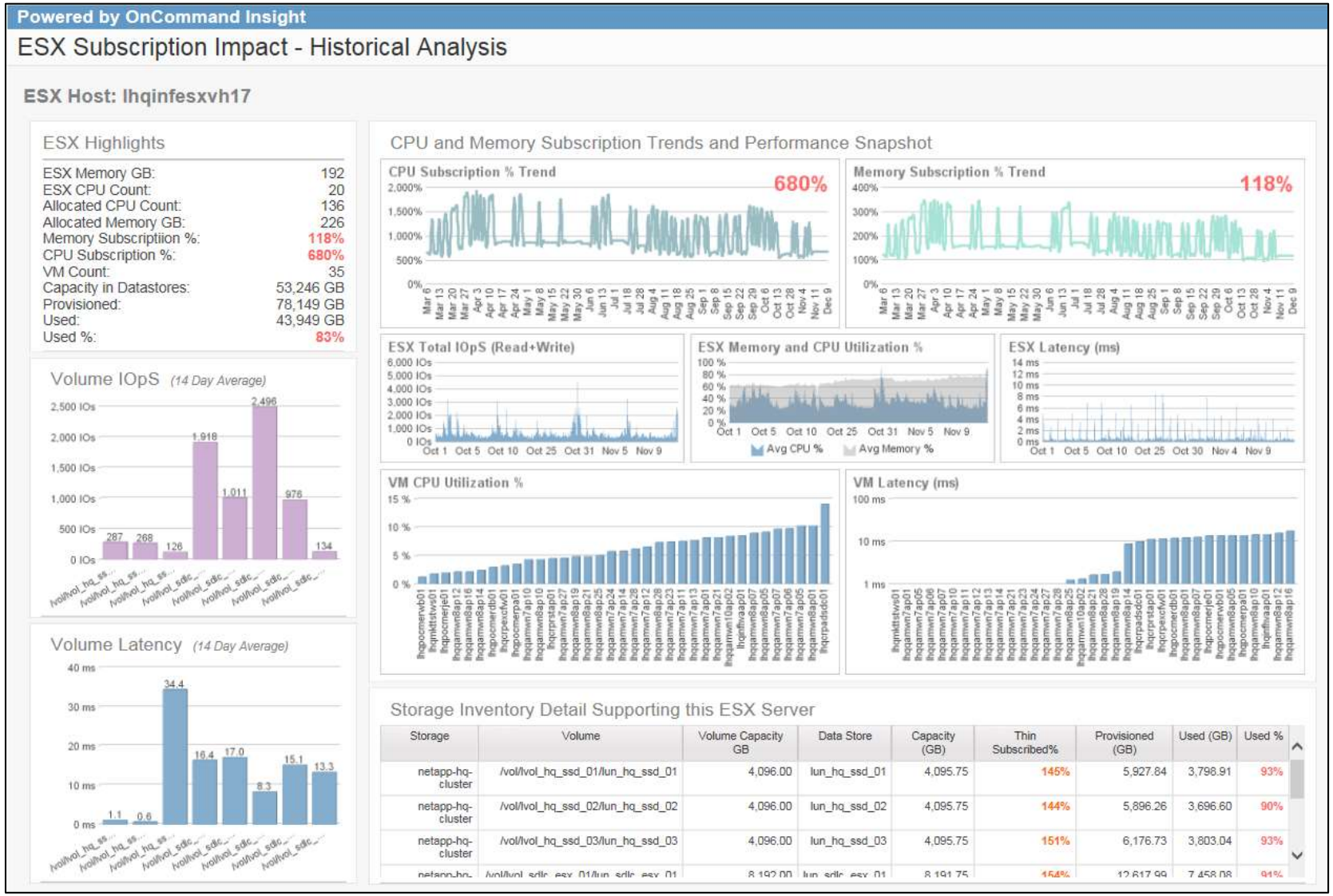

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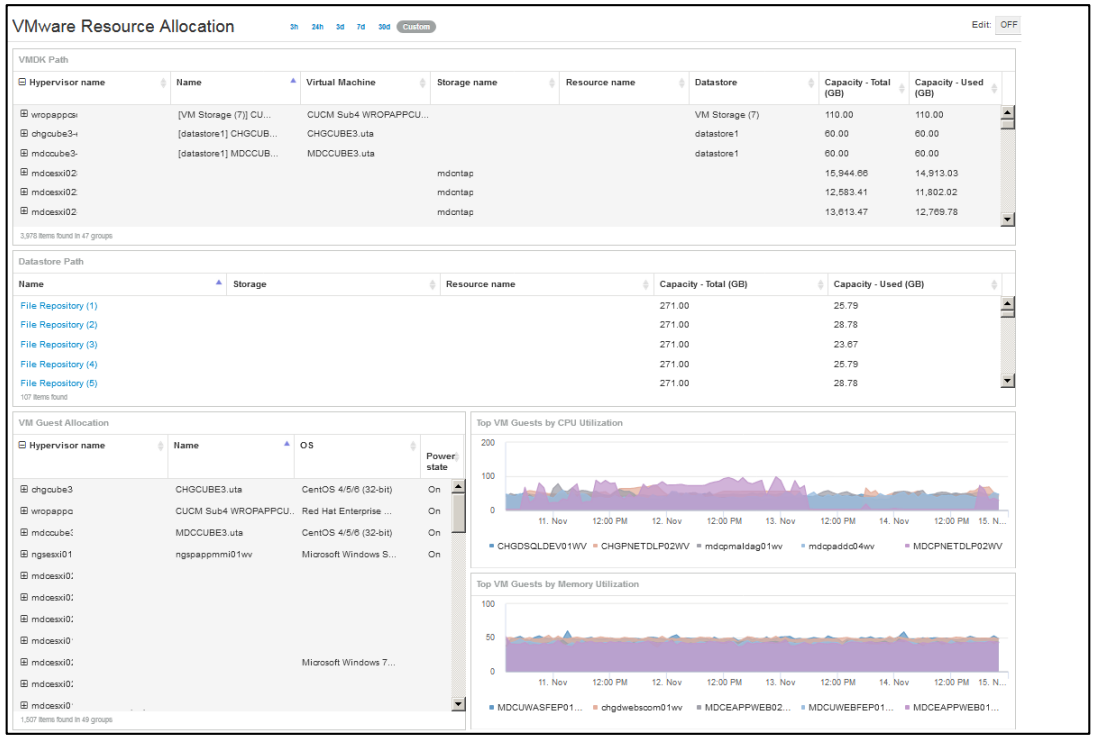
6.7 WebUI – VMware Resource Allocation

Description: This WebUI based dashboard shows VMWare Resource Allocations. At the top, a list of VMDK path objects provide an end-to-end viewpoint into allocated VM capacity. In the middle, a data store list shows datastore dependencies. At the bottom, a list showing virtual machine resource allocations with Top N VM CPU Utilization and Top N VM Memory Utilization trends for the user selected time period.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Hypervisor Name	Name of the ESX Host/Server monitored by OCI.
Virtual Machine	Name of the Vmware Guest associated with the ESX Host monitored by OCI.
VMDK / Name	Name of the Virtual Disk (VMDK) associated with the virtual machine.
OS	Name of the operating system associated with the virtual machine.
Storage name	Name of the storage device monitored by OCI.
Resource name	Name of the volume or resource associated with the datastore.
Datastore / Name	Name of the Datastore associated with the ESX Host monitored by OCI.
Power State	Power State of the virtual machine. (e.g. poweredON, poweredOff, Standby etc.)
Capacity – Total (GB)	Capacity in (GB) provisioned to the VMDK associated with the virtual machine
Capacity – Used (GB)	Used Capacity in (GB) reported by the VMDK associated with the virtual machine. If capacity is thick provisioned, then Used Capacity will equal Capacity.
CPU Utilization	Average CPU Utilization in % for the user selected time period.
Memory Utilization	Average Memory Utilization in % for the user selected time period.
Date	The date field applied to trending charts and selectable by the user.

Click on the report screen shot above to view an enlarged image.

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VMware Resource Allocation

3h 24h 3d 7d 30d Custom

Edit: OFF

VMDK Path

Hypervisor name	Name	Virtual Machine	Storage name	Resource name	Datastore	Capacity - Total (GB)	Capacity - Used (GB)
wropappcs	[VM Storage (7)] CU...	CUCM Sub4 WROPAPPCU...			VM Storage (7)	110.00	110.00
chgcube3-	[datastore1] CHGCUB...	CHGCUBE3.uta			datastore1	60.00	60.00
mdccube3-	[datastore1] MDCCUB...	MDCCUBE3.uta			datastore1	60.00	60.00
mdcesxi02			mdcntap			15,944.66	14,913.03
mdcesxi02			mdcntap			12,583.41	11,802.02
mdcesxi02			mdcntap			13,613.47	12,769.78

3,978 items found in 47 groups

Datastore Path

Name	Storage	Resource name	Capacity - Total (GB)	Capacity - Used (GB)
File Repository (1)			271.00	25.79
File Repository (2)			271.00	28.78
File Repository (3)			271.00	23.67
File Repository (4)			271.00	25.79
File Repository (5)			271.00	28.78

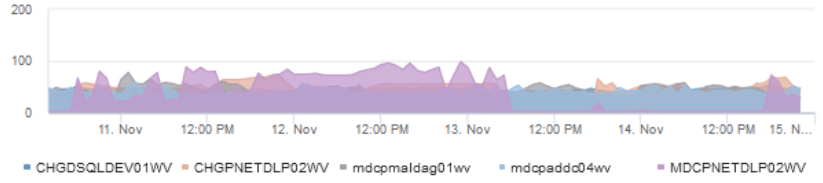
107 items found

VM Guest Allocation

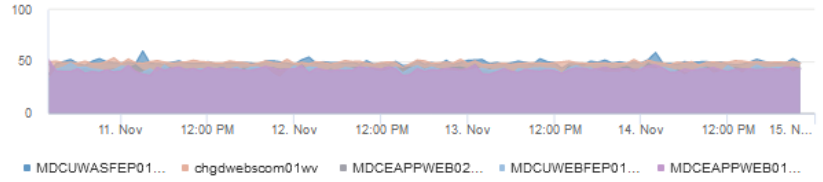
Hypervisor name	Name	OS	Power state
chgcube3	CHGCUBE3.uta	CentOS 4/5/6 (32-bit)	On
wropappc	CUCM Sub4 WROPAPPCU..	Red Hat Enterprise ...	On
mdccube3	MDCCUBE3.uta	CentOS 4/5/6 (32-bit)	On
ngsesxi01	ngspappmmi01wv	Microsoft Windows S...	On
mdcesxi0			
mdcesxi0			
mdcesxi0			
mdcesxi0			
mdcesxi0		Microsoft Windows 7...	
mdcesxi0			
mdcesxi0			

1,507 items found in 49 groups

Top VM Guests by CPU Utilization



Top VM Guests by Memory Utilization



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Workflow Metrics and Triggers Overview

These are some of the day-to-day and monthly workflow metrics that can be addressed by leveraging the reports in this catalog. Here are some of the objectives met by this section:

- Violation management
- Operational reporting
- Environmental reporting

* Any modifications to the Data Dictionary for the reports shown will require a custom report.

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7.1 Violation Trends and Status

Description: This report shows trending for Violations of Policies and Thresholds which have been exceeded. At the top is a summary of violation related metrics. Beneath the summary, are trending for Total number of Violations; Count by Type (of Violations); and Overcommitted Thin Pools. The next section shows Violation Count by Storage, Path Outage trending, impact of Storage Capacity, and Storage Arrays nearing Full Capacity. The last section shows Performance Thresholds by Total IOpS; Average Latency; and Total Throughput. The final chart on the right shows over Storage Arrays with High Fan Out (masked storage port connections).

Prerequisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

☐ **Select This Report**

Field	Description
Violation Count	Total count of violations as configured in OCI FC path policies.
Violation Type	The violation type. E.g. path outage, missing redundancy, unauthorized sharing, missing virtual cluster etc.
Storage Array or Storage	Name of the storage array discovered by OCI.
Thin Pool	Name of the storage pool or aggregate that is thin provisioned.
Capacity (GB) Impacted by Violations	Provisioned capacity in GB that is impacted by a violation type.
Total IOpS	Sum of Average Daily IOpS (both Read and Write) for a period of 365 days.
Latency	Average Latency milliseconds averaged daily for a period of 365 days.
Throughput	Sum of Average Daily Throughput in MB/second (both read and write) for a period of 365 days.
Full Capacity %	Total provisioned physical capacity % for the storage array discovered by OCI.
High Fan Out	Storage ports that are provisioned to more than one host initiators. A fan out of 8 or more will violate the default threshold in OCI. For this report, high fan out is the top five arrays and their highest fan out count for a specific port.
Path Outage	A critical violation as report by OCI FC policies. Indicates a completely failed redundant path between storage and host initiators.
Date	Hourdatetime and/or fulldate fields derived from the Time Dimension and Date Dimension tables in the DWH.

Click on the report screen shot above to view an enlarged image.

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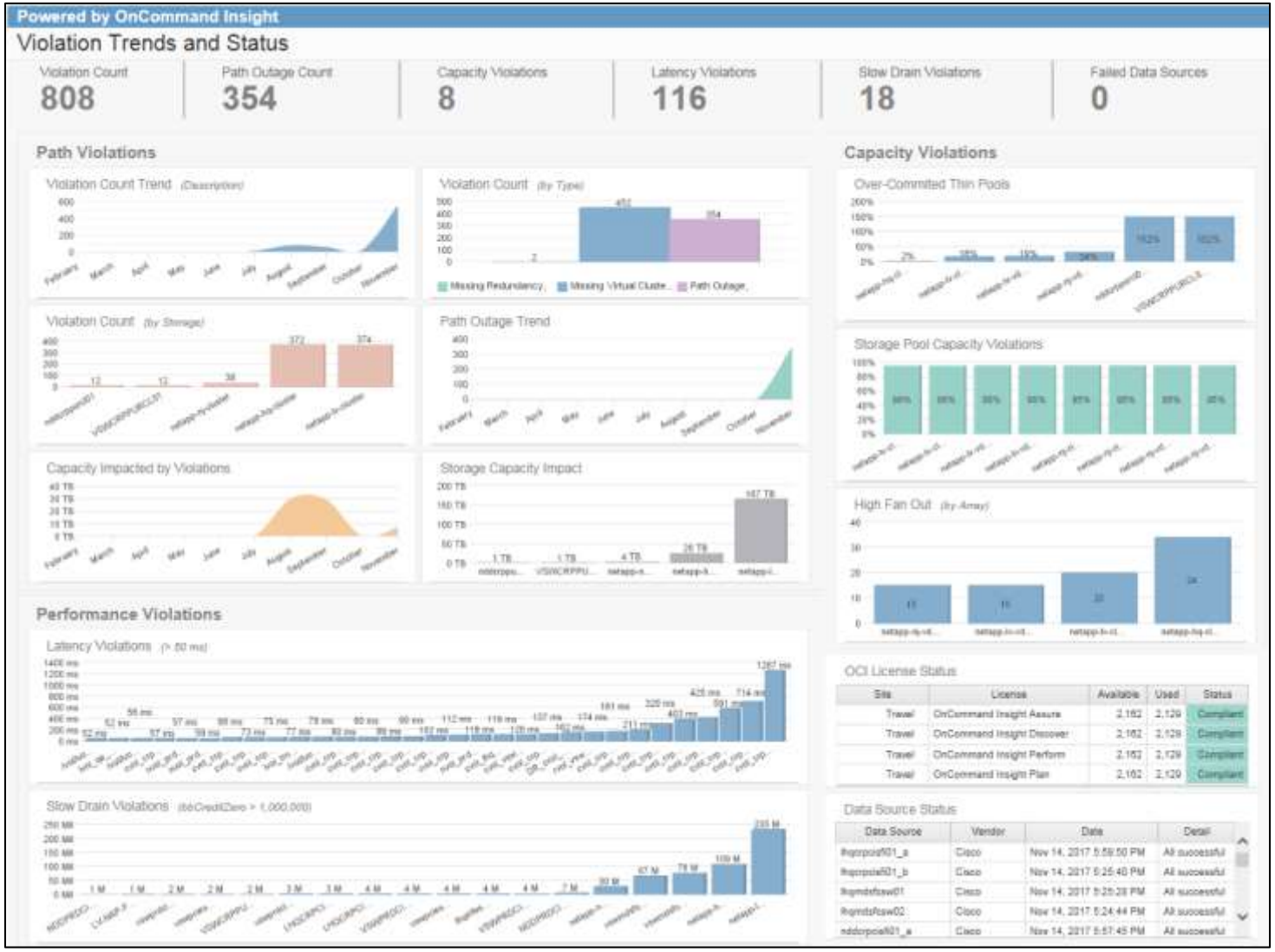

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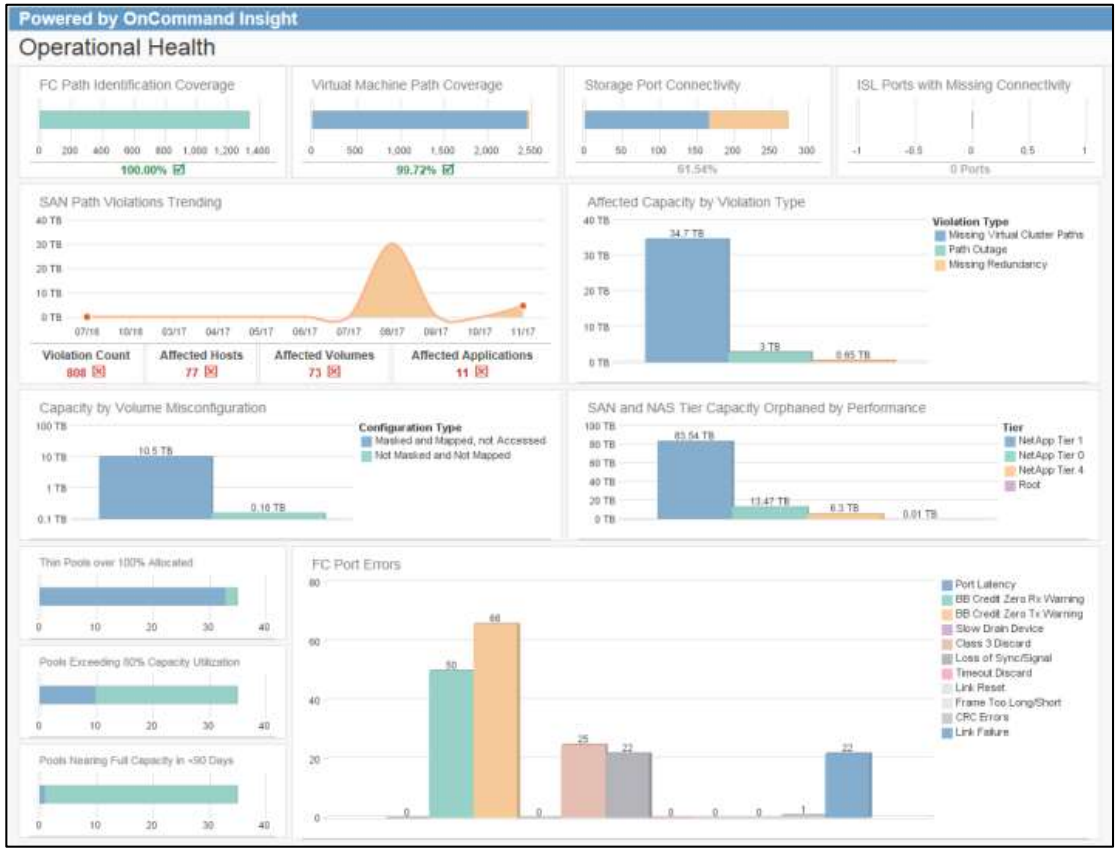
7.2 Operational Health (page 1 of 2)

Description: This dashboard depicts the overall health of the environment. This quickly gives context as to how much and how well the environment is performing, based on Violation rules, Thresholds setup, and how much of the environment has been discovered and identified.

Prerequisites: Annotations/definitions are necessary for Service Level/Tier. This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.

Data Dictionary

See next page



Click on the report screen shot above to view an enlarged image.

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7.2 Operational Health (page 2 of 2)

Field	Description
Tier	OCI configured annotation. Defines tiers of storage based on disk type, disk speed, etc.
Application	OCI configured annotation. Defines the application assigned to hosts or internal volumes.
FC Path Identification Coverage	Total FC path count as enumerated in dwh_inventory.logical. Generic Device Path Count when dwh_inventory.logical.genericDeviceId field is NOT null.
Virtual Machine Path Coverage	Total count of virtual machines. Total count of virtual machines WITHOUT backend storage.
Storage Port Connectivity	Total count of storage ports. Total count of unconnected storage ports (where dwh_inventory.storage_port.id NOT IN dwh_inventory.port_connectivity.portId (means its not connected to anything J)
ISL Ports with Missing Connectivity	Count of ISL 'E' ports with missing connectivity.
Capacity Orphaned by Performance	Total SAN capacity where Max Total IOpS = 0 for the past 30 days.
SAN Path Violation Trends	Count of SAN path violations trending over time. There is no set timeframe for trend.
Violation Count	Total count of path violations as reported by OCI FC path policies.
Affected Hosts	Total count of hosts that are impacted by violations.
Affected Volumes	Total count of storage volumes that are impacted by violations.
Affected Applications	Total count of applications that are impacted by violations.
Violation Type	The violation type. E.g. path outage, missing redundancy, unauthorized sharing, missing virtual cluster etc.
Capacity by Volume Misconfiguration	Volume misconfiguration = volumes that are masked and mapped but not accessed, not masked and not mapped or mapped but not masked.
Masked and Mapped, not Accessed	A volume that is masked (lun masked) to a host initiator and mapped to a storage port but not 'accessed' by a host. That is, no file system exists on the lun.

Data Dictionary

☐ **Select This Report**

Field	Description
Not Masked and Not Mapped	A volume that is neither mapped or masked.
Mapped, but not Masked	A volume that is mapped to a storage port but not masked to a host initiator.
Thin Pools	Storage pools or aggregates that are using thin provisioning storage efficiency technology.
Capacity Utilization	Used capacity %. If thick provisioned, it is the % of capacity that is visible to hosts. If thin provisioned, it is the % of capacity that is written in TB.
FC Port Errors	SAN FC Switch port errors.
Port Latency	Defined as BB Credit Zero milliseconds transmit > 0.
BB Credit Zero Rx Warning	Count of BB Credit Zero warnings for frames received. When BB Credit Zero warnings are excessive, performance will be affected.
BB Credit Zero Tx Warning	Count of BB Credit Zero warnings for frames transmitted. When BB Credit Zero warnings are excessive, performance will be affected.
Slow Drain Device	See Slow Drain definition below.
Class 3 Discard	Count of frames sent without FLOGling or with an invalid destination.
Timeout Discard	Defined as port error discard timeout > 0
Link Reset	Link reset count > 0
Frame too Long/Short	Frame too Long/Short count > 0
CRC Errors	Rate of Cyclical Redundancy Check errors. Usually indicates a physical problem within the FC link which lead to corruption inside the FC data frame.
Link Failure	Port error link failure count > 0
Date	Date dimension object in the OCI database.
Slow Drain Definition and BB Credit Error Count Correlation	For devices to qualify for slow drain, bbCreditZeroRx and Tx must be greater than 1,000,000 and bbCreditZeroMsTx must be >=1.

See Previous page

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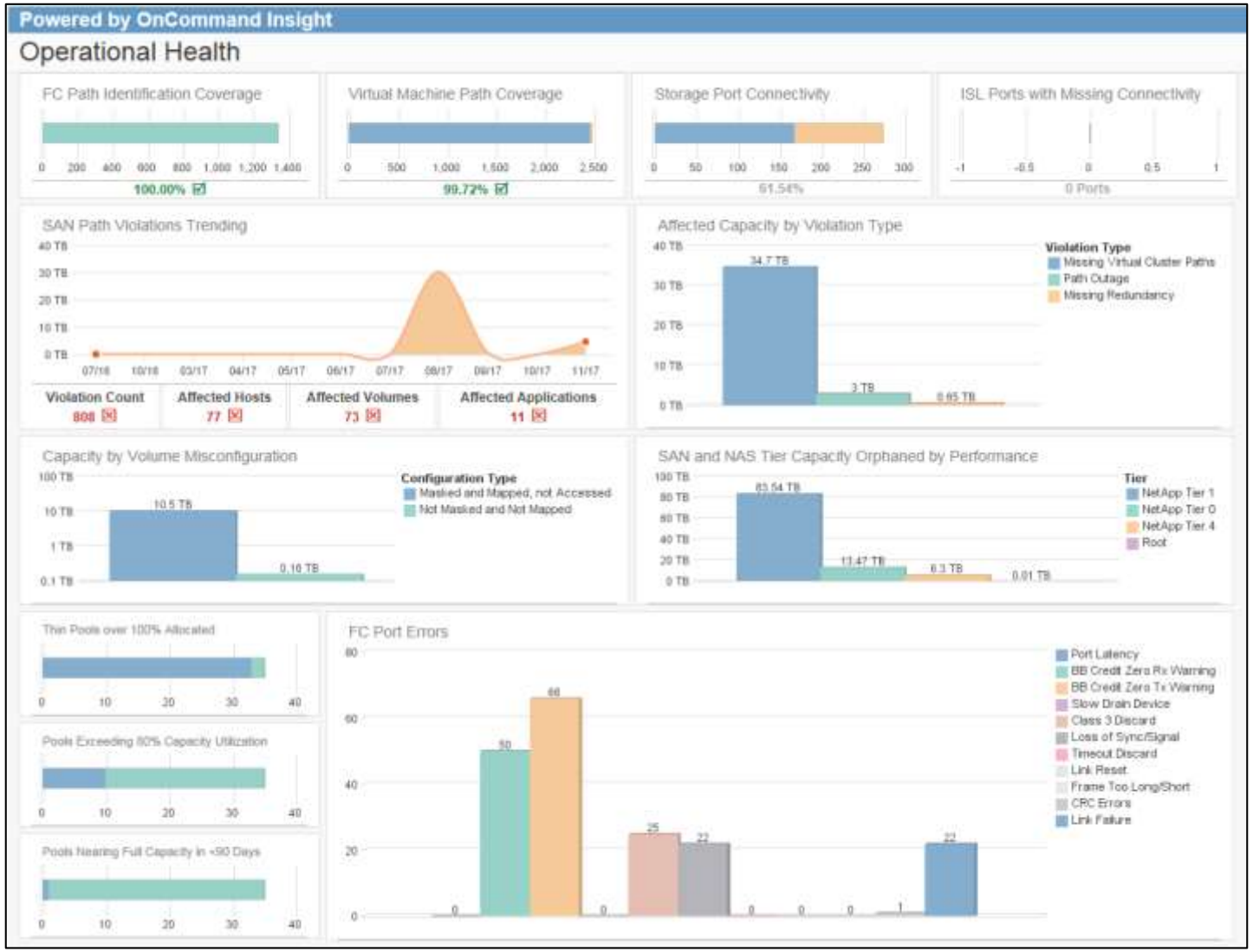

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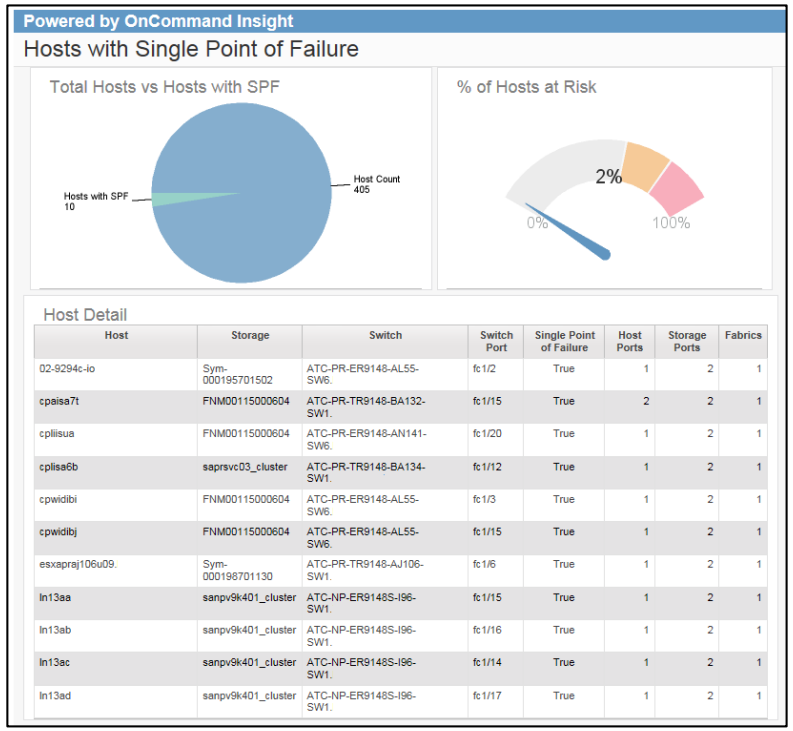
7.3 Hosts with Single Point of Failure

Description: This report provides a list of SAN attached physical hosts that have a single point of failure in the fabric. At the top of the page are summary charts showing a breakdown of hosts and hosts at risk. At the bottom is a detailed list showing the relative path for each violation.

Prerequisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover and Plan.



Host	Storage	Switch	Switch Port	Single Point of Failure	Host Ports	Storage Ports	Fabrics
02-9294c-io	Sym-000195701502	ATC-PR-ER9148-AL55-SW6.	fc1/2	True	1	2	1
cpaisa7t	FNM00115000604	ATC-PR-TR9148-BA132-SW1.	fc1/15	True	2	2	1
cpliisua	FNM00115000604	ATC-PR-ER9148-AN141-SW6.	fc1/20	True	1	2	1
cplisa6b	saprsvc03_cluster	ATC-PR-TR9148-BA134-SW1.	fc1/12	True	1	2	1
cpwidibi	FNM00115000604	ATC-PR-ER9148-AL55-SW6.	fc1/3	True	1	2	1
cpwidibj	FNM00115000604	ATC-PR-ER9148-AL55-SW6.	fc1/15	True	1	2	1
esxapraj106u09.	Sym-000198701130	ATC-PR-TR9148-AJ106-SW1.	fc1/6	True	1	2	1
ln13aa	sanpv9k401_cluster	ATC-NP-ER9148S-I96-SW1.	fc1/15	True	1	2	1
ln13ab	sanpv9k401_cluster	ATC-NP-ER9148S-I96-SW1.	fc1/16	True	1	2	1
ln13ac	sanpv9k401_cluster	ATC-NP-ER9148S-I96-SW1.	fc1/14	True	1	2	1
ln13ad	sanpv9k401_cluster	ATC-NP-ER9148S-I96-SW1.	fc1/17	True	1	2	1

Data Dictionary

☐ **Select This Report**

Field	Description
Host	Name of the physical host resolved via auto host resolution in OCI. Auto host resolution is the process where a host WWN is correlated to an IP address via NSLOOKUP or PING.
Storage	Name of the storage array discovered by OCI.
Switch	Name of the SAN switch discovered by OCI.
Switch Port	Name of the port associated with the switch discovered by OCI.
Single Point of Failure	Single Point of Failure (true or false). True if only one path exists.
Host Ports	Number of host ports connected
Storage Ports	Number of storage ports connected.
Fabrics	Number of Switch Fabrics.
% of Hosts at Risk	% of hosts (out of total physical resolved in OCI) that are at risk due to single point of failure = true.
Host Count	Total number of physical hosts resolved in OCI.
Hosts with SPF	Total number of physical hosts with single point of failure flag = true.

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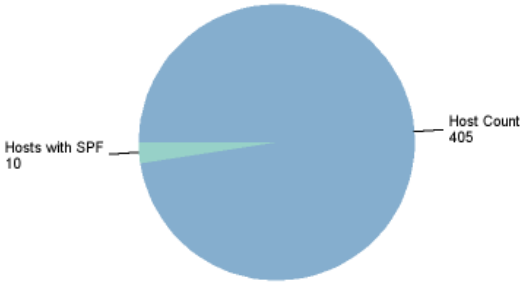
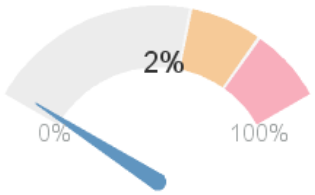
Hosts with Single Point of Failure

Total Hosts vs Hosts with SPF



% of Hosts at Risk



Host Detail

Host	Storage	Switch	Switch Port	Single Point of Failure	Host Ports	Storage Ports	Fabrics
02-9294c-io	Sym-000195701502	ATC-PR-ER9148-AL55-SW6.	fc1/2	True	1	2	1
cpaisa7t	FNM00115000604	ATC-PR-TR9148-BA132-SW1.	fc1/15	True	2	2	1
cpliisua	FNM00115000604	ATC-PR-ER9148-AN141-SW6.	fc1/20	True	1	2	1
cplisa6b	saprsvc03_cluster	ATC-PR-TR9148-BA134-SW1.	fc1/12	True	1	2	1
cpwidibi	FNM00115000604	ATC-PR-ER9148-AL55-SW6.	fc1/3	True	1	2	1
cpwidibj	FNM00115000604	ATC-PR-ER9148-AL55-SW6.	fc1/15	True	1	2	1
esxapraj106u09.	Sym-000198701130	ATC-PR-TR9148-AJ106-SW1.	fc1/6	True	1	2	1
In13aa	sanpv9k401_cluster	ATC-NP-ER9148S-I96-SW1.	fc1/15	True	1	2	1
In13ab	sanpv9k401_cluster	ATC-NP-ER9148S-I96-SW1.	fc1/16	True	1	2	1
In13ac	sanpv9k401_cluster	ATC-NP-ER9148S-I96-SW1.	fc1/14	True	1	2	1
In13ad	sanpv9k401_cluster	ATC-NP-ER9148S-I96-SW1.	fc1/17	True	1	2	1

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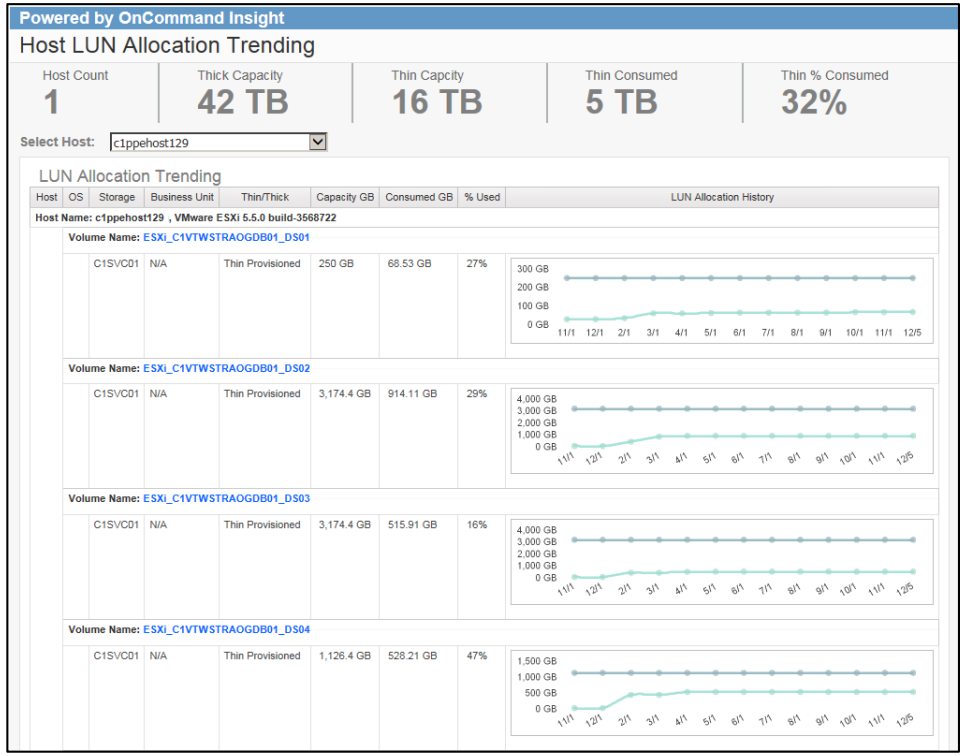
7.4 Host LUN Allocation Trending

Description: This report shows LUNs allocated to hosts and the historical trend of allocations. A summary of hosts and capacity are visible at the top. At the bottom, hosts are grouped with each LUN, capacity metrics and historical trends chart.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Host Name	The name of the physical host that was resolved via auto host resolution in OCI. Auto host resolution is the process where a host WWN is correlated to an IP address via NSLOOKUP or PING.
Volume Name	Name of the Volume associated with the Storage Array discovered by OCI.
OS	Name of the OS (Operating System) associated with the Host.
Storage	Name of the Storage Array discovered by OCI.
Business Unit	Business Unit annotation associated with the Volume or Host in OCI.
Thin/Thick	Indicates whether a Volume is Thin or Thick Provisioned.
Capacity GB	Capacity in GB that is Provisioned (Mapped and Masked) to the Volume.
Consumed GB	Capacity in GB that is written if the volume is thin provisioned.
% Used	Capacity in % that is used. Consumed GB / Capacity GB.
Date	Fulldate field derived from the Date Dimension tables in the DWH.

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Host LUN Allocation Trending

Host Count	Thick Capacity	Thin Capcity	Thin Consumed	Thin % Consumed
1	42 TB	16 TB	5 TB	32%

Select Host: c1ppehost129

LUN Allocation Trending

Host	OS	Storage	Business Unit	Thin/Thick	Capacity GB	Consumed GB	% Used	LUN Allocation History
Host Name: c1ppehost129 , VMware ESXi 5.5.0 build-3568722								
Volume Name: ESXi_C1VTWSTRAOGDB01_DS01								
		C1SVC01	N/A	Thin Provisioned	250 GB	68.53 GB	27%	
Volume Name: ESXi_C1VTWSTRAOGDB01_DS02								
		C1SVC01	N/A	Thin Provisioned	3,174.4 GB	914.11 GB	29%	
Volume Name: ESXi_C1VTWSTRAOGDB01_DS03								
		C1SVC01	N/A	Thin Provisioned	3,174.4 GB	515.91 GB	16%	
Volume Name: ESXi_C1VTWSTRAOGDB01_DS04								
		C1SVC01	N/A	Thin Provisioned	1,126.4 GB	528.21 GB	47%	

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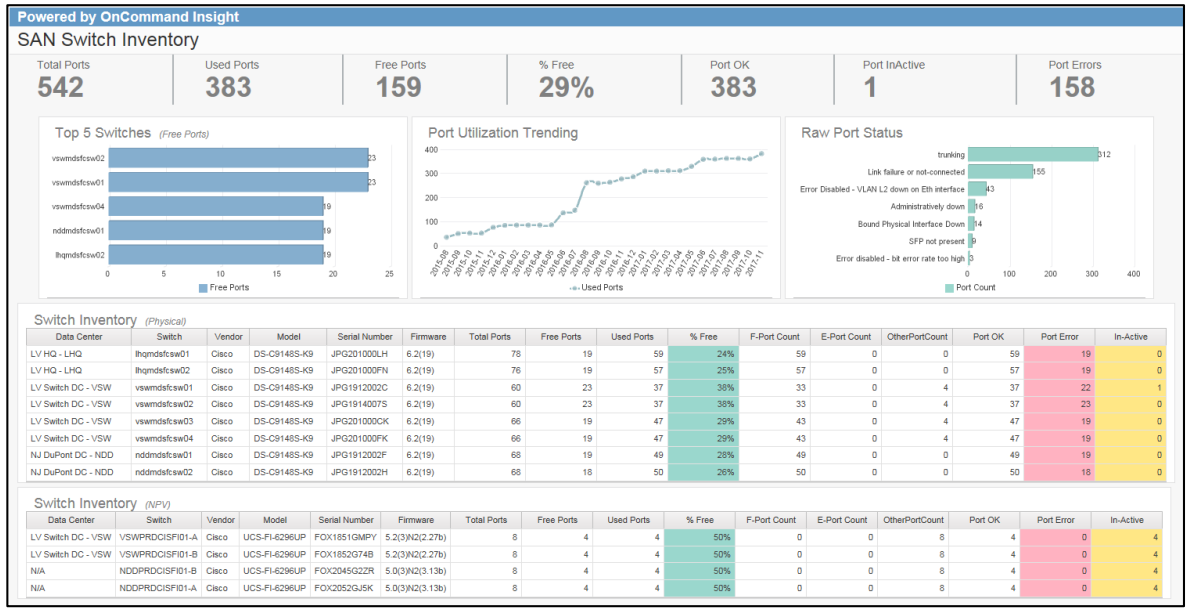
7.5 SAN Switch Inventory

Description: This report contains an overall view of SAN Switch Inventory. At the top, is a global summary of port count inventory. It shows Trending and Port Status on the top and summary detail about the switches across the bottom.

Prerequisites: This is only available in OnCommand Insight versions 7.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	OCI configured annotation. Defines the location of the device.
Switch Name	Name of the SAN switch discovered by OCI.
Manufacturer	Name of the manufacturer of the switch discovered by OCI.
Model	The model name of the switch discovered by OCI.
Firmware	The firmware version of the switch discovered by OCI.
Total Ports	Total number of ports associated with each switch.
Used Ports	Total number of used ports associated with each switch.
Free Ports	Total number of free ports associated with each switch.
% Free	Free Ports / Total Ports
Port OK	Total number of active ports on the switch.
Port Inactive	Total number of inactive ports on the switch.
Not Licensed	Total number of ports that are not licensed.
Port Errors	Total number of port errors.
Date	Fulldate field derived from the Date Dimension tables in the DWH.

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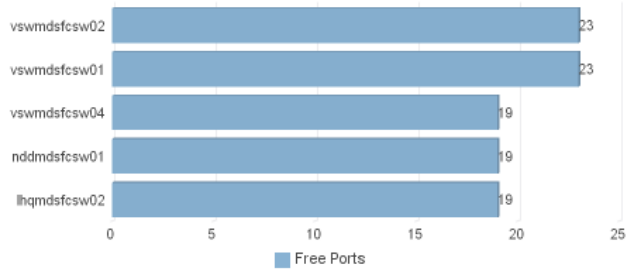
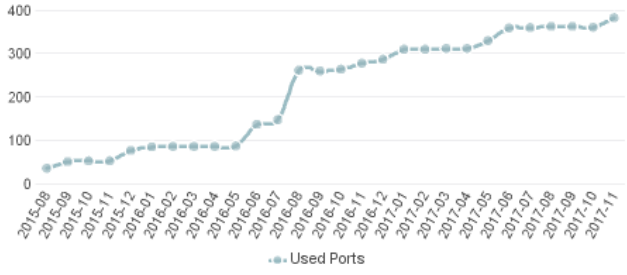
SAN Switch Inventory

Total Ports	Used Ports	Free Ports	% Free	Port OK	Port InActive	Port Errors
542	383	159	29%	383	1	158

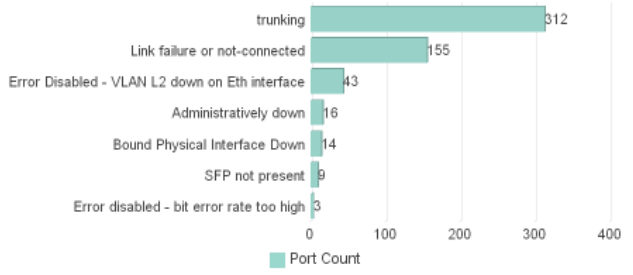
Top 5 Switches *(Free Ports)*



Port Utilization Trending



Raw Port Status



Switch Inventory *(Physical)*

Data Center	Switch	Vendor	Model	Serial Number	Firmware	Total Ports	Free Ports	Used Ports	% Free	F-Port Count	E-Port Count	OtherPortCount	Port OK	Port Error	In-Active
LV HQ - LHQ	lhqmdsfcsw01	Cisco	DS-C9148S-K9	JPG201000LH	6.2(19)	78	19	59	24%	59	0	0	59	19	0
LV HQ - LHQ	lhqmdsfcsw02	Cisco	DS-C9148S-K9	JPG201000FN	6.2(19)	76	19	57	25%	57	0	0	57	19	0
LV Switch DC - VSW	vswmdsfcsw01	Cisco	DS-C9148S-K9	JPG1912002C	6.2(19)	60	23	37	38%	33	0	4	37	22	1
LV Switch DC - VSW	vswmdsfcsw02	Cisco	DS-C9148S-K9	JPG1914007S	6.2(19)	60	23	37	38%	33	0	4	37	23	0
LV Switch DC - VSW	vswmdsfcsw03	Cisco	DS-C9148S-K9	JPG201000CK	6.2(19)	66	19	47	29%	43	0	4	47	19	0
LV Switch DC - VSW	vswmdsfcsw04	Cisco	DS-C9148S-K9	JPG201000FK	6.2(19)	66	19	47	29%	43	0	4	47	19	0
NJ DuPont DC - NDD	nddmdsfcsw01	Cisco	DS-C9148S-K9	JPG1912002F	6.2(19)	68	19	49	28%	49	0	0	49	19	0
NJ DuPont DC - NDD	nddmdsfcsw02	Cisco	DS-C9148S-K9	JPG1912002H	6.2(19)	68	18	50	26%	50	0	0	50	18	0

Switch Inventory *(NPV)*

Data Center	Switch	Vendor	Model	Serial Number	Firmware	Total Ports	Free Ports	Used Ports	% Free	F-Port Count	E-Port Count	OtherPortCount	Port OK	Port Error	In-Active
LV Switch DC - VSW	VSWPRDCISFI01-A	Cisco	UCS-FI-6296UP	FOX1851GMPY	5.2(3)N2(2.27b)	8	4	4	50%	0	0	8	4	0	4
LV Switch DC - VSW	VSWPRDCISFI01-B	Cisco	UCS-FI-6296UP	FOX1852G74B	5.2(3)N2(2.27b)	8	4	4	50%	0	0	8	4	0	4
N/A	NDDPRDCISFI01-B	Cisco	UCS-FI-6296UP	FOX2045G2ZR	5.0(3)N2(3.13b)	8	4	4	50%	0	0	8	4	0	4
N/A	NDDPRDCISFI01-A	Cisco	UCS-FI-6296UP	FOX2052GJ5K	5.0(3)N2(3.13b)	8	4	4	50%	0	0	8	4	0	4

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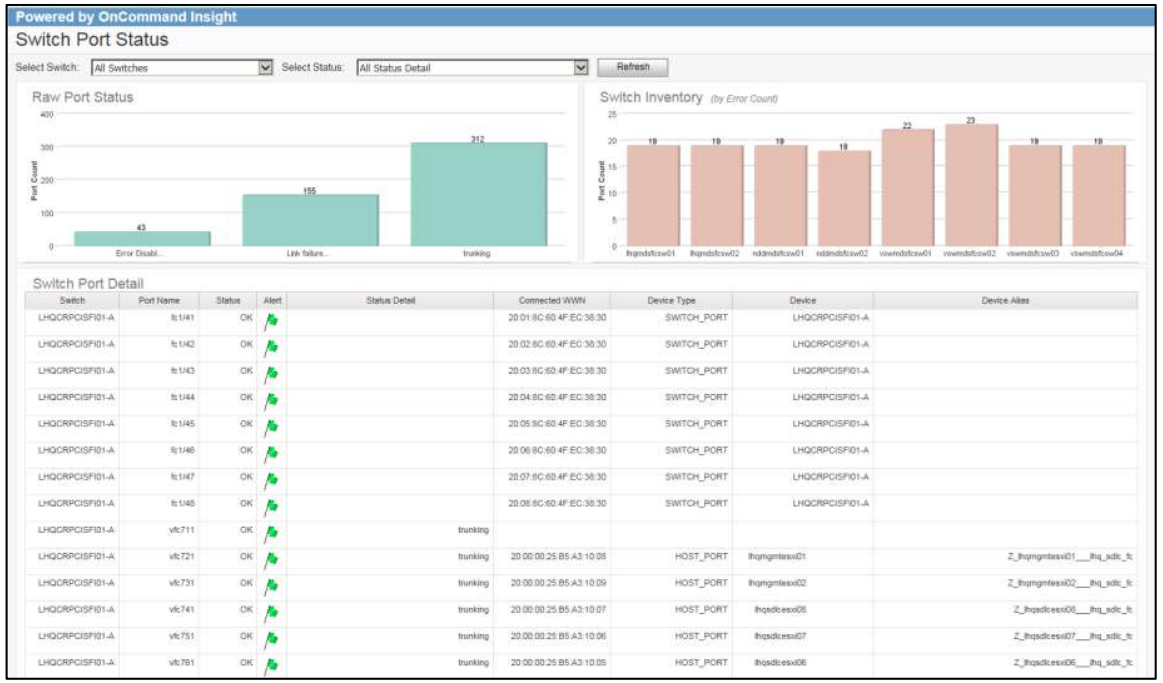
7.6 Switch Port Status

Description: This report is used to show report status. Common examples include 'Online', 'No_Sync', and 'No_Light'. Detail includes switch, port name, connected WWN, Device Type and Device Alias. Alert column shows GREEN for Online and RED for everything else.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Switch	Name of the SAN switch discovered by OCI.
Port Name	Name of the port associated with the SAN switch.
Status	The status of the port, e.g. OK, ERROR, NOT LICENSED, INACTIVE.
Alert	GREEN = onLine, RED=everything else.
Status Detail	The port status detail, e.g. onLine, no_light, no_module, etc.
Connected WWN	The WWN of the connected device.
Device Type	The connected device type, e.g. switch, storage, host, tape, generic.
Device	Name of the device connected to the switch.
Device Alias	Zone alias of the device connected to the switch.

Click on the report screen shot above to view an enlarged image.

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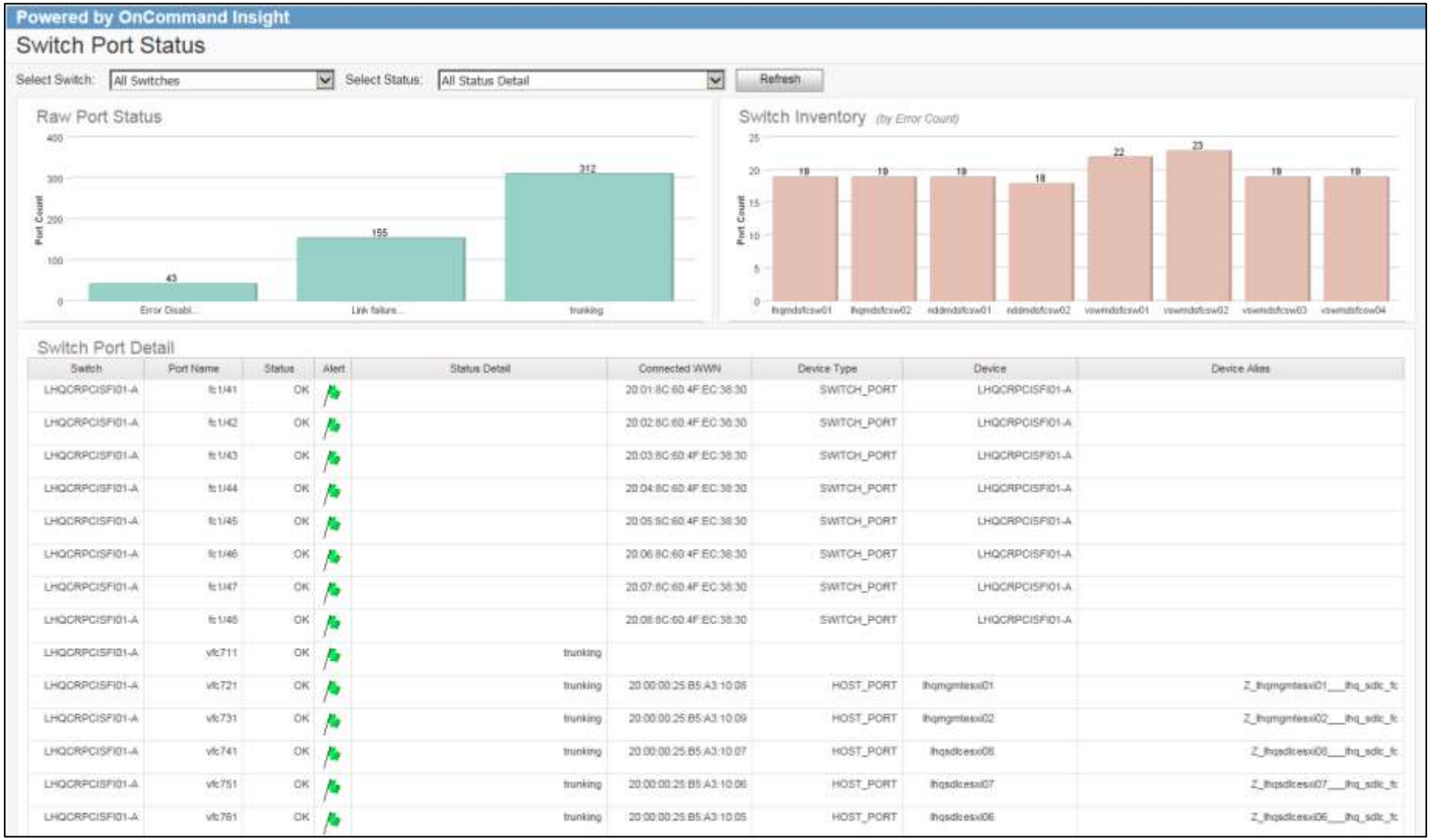

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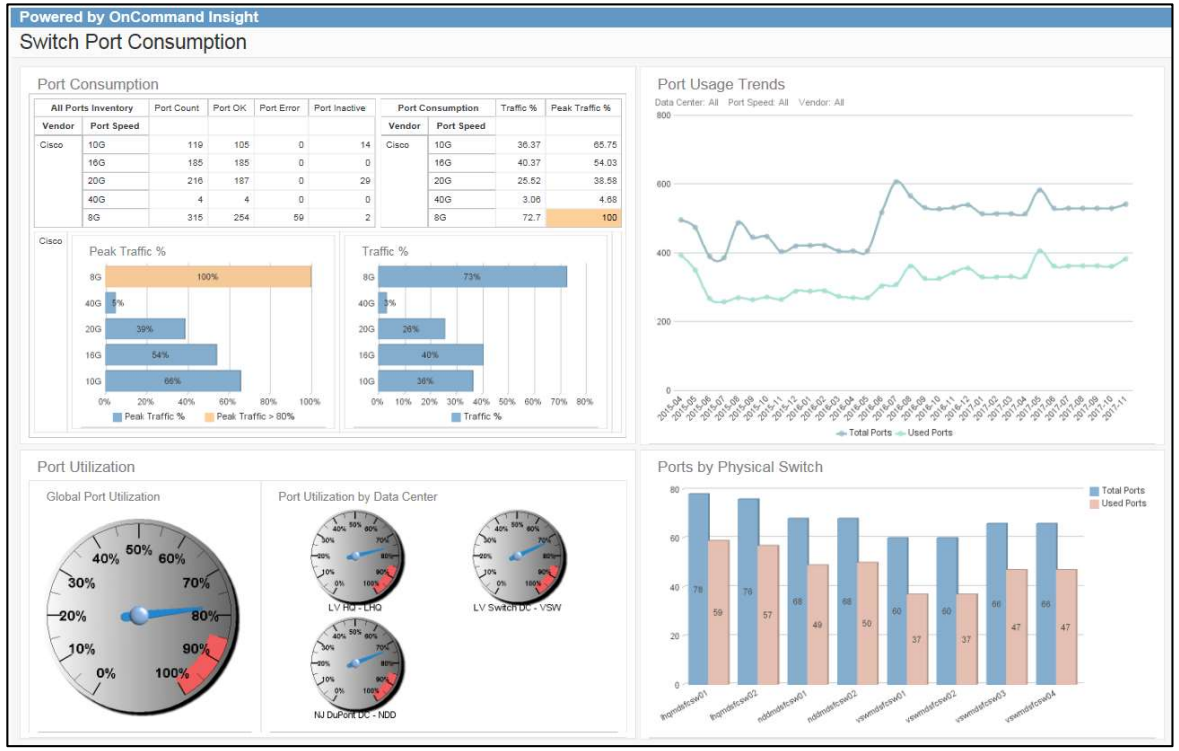
7.7 Switch Port Consumption

Description: This report shows SAN Switch Port Consumption by Vendor, port usage trends and port utilization by data center.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Data Center	Name of the Site/Data Center configured in OCI and assigned to SAN Switches.
Vendor	Name of the Manufacturer associated with the SAN Switch discovered by OCI.
Switch Name	Name of the SAN Switch discovered by OCI.
Traffic %	% of total traffic (received + transmitted) grouped by Port Speed.
Peak Traffic %	% of PEAK traffic (received + transmitted) grouped by Port Speed.
Total Ports	Total physical ports as reported by all physical switches discovered by OCI.
Used Ports	Total physical ports that are lit or in-use.
Port Speed	Speed of the ports associated with the SAN Switch discovered by OCI.
Date	Fulldate field derived from the Date Dimension tables in the DWH..

Click on the report screen shot above to view an enlarged image.

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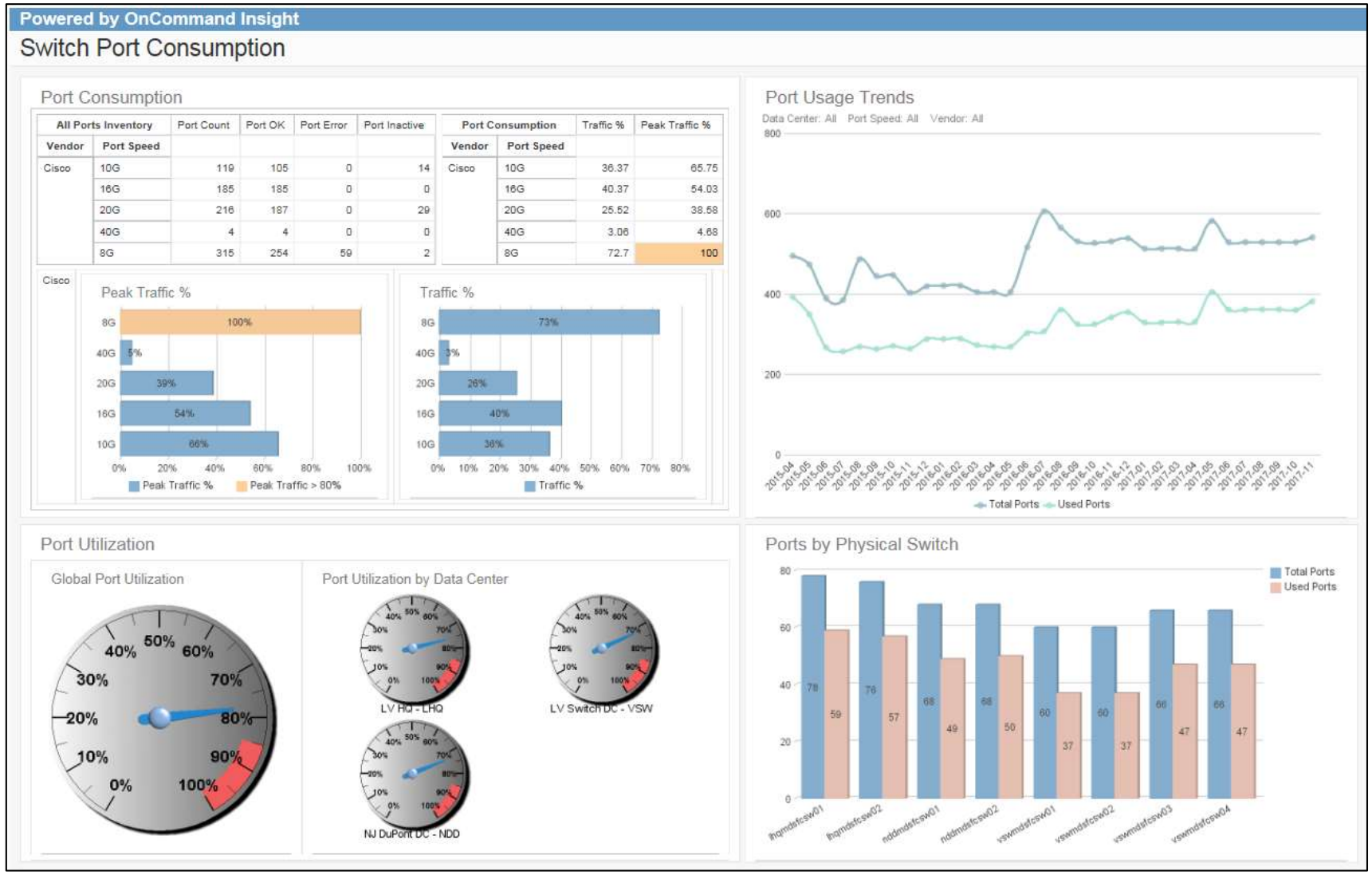

 Click on the screen shot above to return to the report description.

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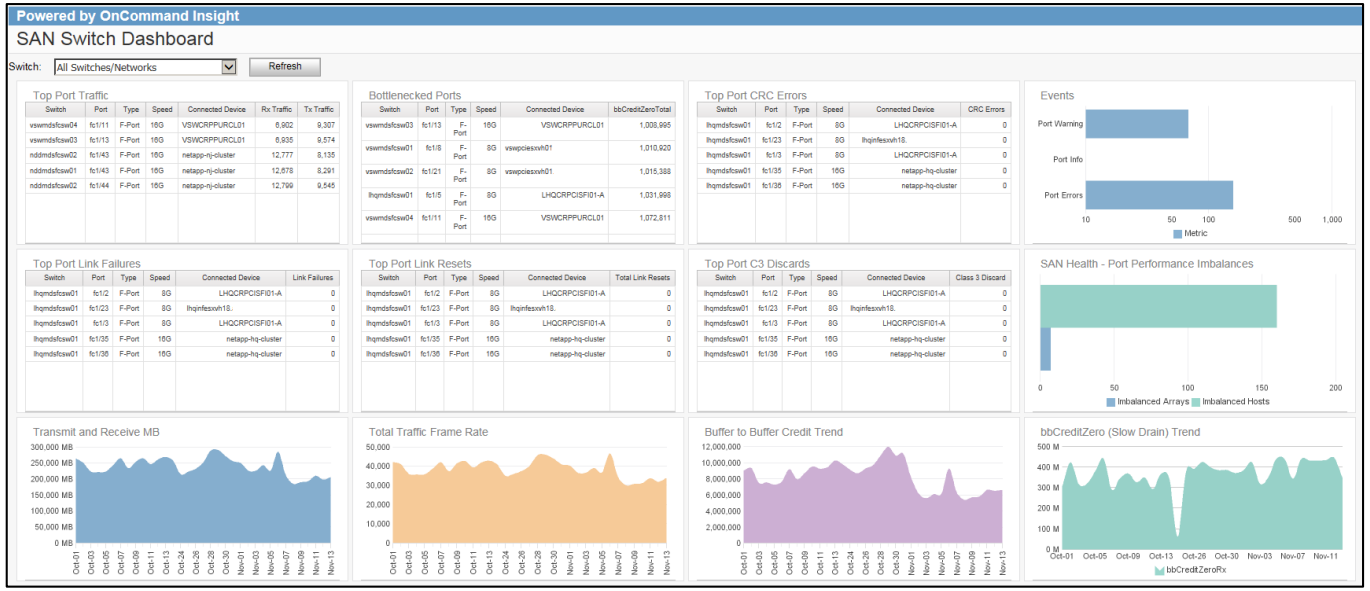
7.8 SAN Switch Dashboard (page 1 of 2)

Description: This dashboard presents SAN port performance metrics and analytics. Top Port Traffic and Bottlenecked Ports use a bar graph to show highest range ports for their respective objectives. Trend charts show overall network traffic, frame rates, bbCredits and Average Slow Drain Rate (based on bbCreditZeroTx / trafficFrameRateTx) hourly for the selected period.

Prerequisites: Requires secondary ETL script to run nightly. There is a Non-ETL version as well. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

See next page

Click on the report screen shot above to view an enlarged image.

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7.8 SAN Switch Dashboard (page 2 of 2)

Field	Description
Switch Name	Name of the SAN switch discovered and monitored by OCI.
Port Name	Name of the port associated with the switch.
Port Type	Type of port, e.g. F-Port, E-Port, etc.
Connected Device	Name of the device connected to the switch port.
Date/Time	Date object used for trending capacity and performance metrics.
RxValueMB	Data received in MB for the selected time period.
TxValueMB	Data transmitted in MB for the selected time period.
Link Failures	Number of link failures associated with the switch port.
SlowDrainRate	Slow drain is calculated based on the following: • WHERE dwh_performance.switch_performance_for_port_hourly_fact.bbCreditZeroRx > 1000000 • OR dwh_performance.switch_performance_for_port_hourly_fact.bbCreditZeroTx > 1000000 • OR dwh_performance.switch_performance_for_port_hourly_fact.bbCreditZeroMsTx > 1.
bbCreditZeroTx or Rx	This is a counter that indicates that all buffers are allocated. This number is used to identify potential congestion on a port.
trafficFrameRateTx	This is the transmit frame rate per second as reported in the last data point received for the flow.

Data Dictionary

☐ **Select This Report**

Field	Description
RxLinkResets	The number (error rate) receive link reset errors per second for the selected time period.
TxLinkResets	The number (error rate) transmit link reset errors per second for the selected time period.
portErrorsCRC	The number (error rate) of cyclic redundancy check (CRC) errors per second for the time period.
Class 3 Discard Count	The number of Class 3 frames discarded due to timeout.
Port Warning	The total number of INACTIVE ports.
Port Errors	The total number of ports with ERRORS.
Port Info	The total number of ports that are NOT_LICENSED.
Imbalanced Arrays	Occurs when the traffic load across the Fibre Channel (FC) ports of a device is not evenly distributed. A violation is generated when the balance index for a host is above the threshold specified in the policy relevant for that host. The higher the balance index is, the more unevenly distributed the traffic is across the ports.
Imbalanced Hosts	Same as above but for hosts.
Buffer to Buffer Credit Count	A flow control mechanism that represents the availability of resources at the receiving port. The default is 1.
Total Traffic Frame Rate	trafficFrameRateTx + trafficFrameRateRx
Transmit and Receive MB	RxValueMB + TxValueMB

See Previous page

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SAN Switch Dashboard

Switch: All Switches/Networks Refresh

Top Port Traffic

Switch	Port	Type	Speed	Connected Device	Rx Traffic	Tx Traffic
vswmdsfcsw04	fc1/11	F-Port	16G	VSWCRPPURCL01	6,902	9,307
vswmdsfcsw03	fc1/13	F-Port	16G	VSWCRPPURCL01	6,935	9,574
nddmdsfcsw02	fc1/43	F-Port	16G	netapp-nj-cluster	12,777	8,135
nddmdsfcsw01	fc1/43	F-Port	16G	netapp-nj-cluster	12,678	8,291
nddmdsfcsw02	fc1/44	F-Port	16G	netapp-nj-cluster	12,799	9,545

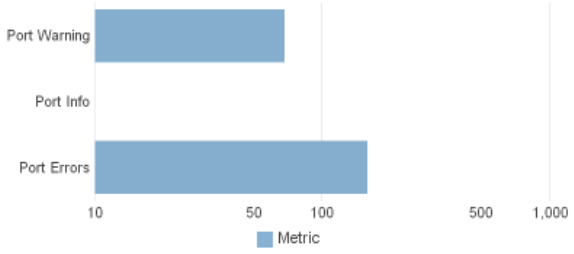
Bottlenecked Ports

Switch	Port	Type	Speed	Connected Device	bbCreditZeroTotal
vswmdsfcsw03	fc1/13	F-Port	16G	VSWCRPPURCL01	1,008,995
vswmdsfcsw01	fc1/8	F-Port	8G	vswpciesxvh01	1,010,920
vswmdsfcsw02	fc1/21	F-Port	8G	vswpciesxvh01.	1,015,388
lhqmdsfcsw01	fc1/5	F-Port	8G	LHQCRPCISFI01-A	1,031,998
vswmdsfcsw04	fc1/11	F-Port	16G	VSWCRPPURCL01	1,072,811

Top Port CRC Errors

Switch	Port	Type	Speed	Connected Device	CRC Errors
lhqmdsfcsw01	fc1/2	F-Port	8G	LHQCRPCISFI01-A	0
lhqmdsfcsw01	fc1/23	F-Port	8G	lhqinfesxvh18.	0
lhqmdsfcsw01	fc1/3	F-Port	8G	LHQCRPCISFI01-A	0
lhqmdsfcsw01	fc1/35	F-Port	16G	netapp-hq-cluster	0
lhqmdsfcsw01	fc1/36	F-Port	16G	netapp-hq-cluster	0

Events



Top Port Link Failures

Switch	Port	Type	Speed	Connected Device	Link Failures
lhqmdsfcsw01	fc1/2	F-Port	8G	LHQCRPCISFI01-A	0
lhqmdsfcsw01	fc1/23	F-Port	8G	lhqinfesxvh18.	0
lhqmdsfcsw01	fc1/3	F-Port	8G	LHQCRPCISFI01-A	0
lhqmdsfcsw01	fc1/35	F-Port	16G	netapp-hq-cluster	0
lhqmdsfcsw01	fc1/36	F-Port	16G	netapp-hq-cluster	0

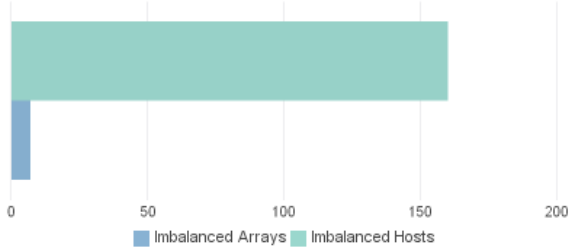
Top Port Link Resets

Switch	Port	Type	Speed	Connected Device	Total Link Resets
lhqmdsfcsw01	fc1/2	F-Port	8G	LHQCRPCISFI01-A	0
lhqmdsfcsw01	fc1/23	F-Port	8G	lhqinfesxvh18.	0
lhqmdsfcsw01	fc1/3	F-Port	8G	LHQCRPCISFI01-A	0
lhqmdsfcsw01	fc1/35	F-Port	16G	netapp-hq-cluster	0
lhqmdsfcsw01	fc1/36	F-Port	16G	netapp-hq-cluster	0

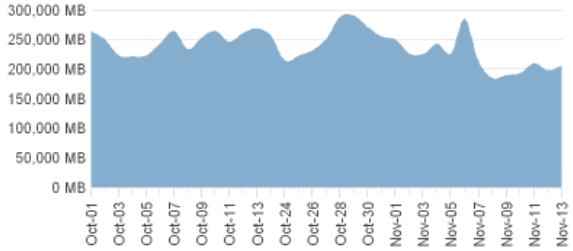
Top Port C3 Discards

Switch	Port	Type	Speed	Connected Device	Class 3 Discard
lhqmdsfcsw01	fc1/2	F-Port	8G	LHQCRPCISFI01-A	0
lhqmdsfcsw01	fc1/23	F-Port	8G	lhqinfesxvh18.	0
lhqmdsfcsw01	fc1/3	F-Port	8G	LHQCRPCISFI01-A	0
lhqmdsfcsw01	fc1/35	F-Port	16G	netapp-hq-cluster	0
lhqmdsfcsw01	fc1/36	F-Port	16G	netapp-hq-cluster	0

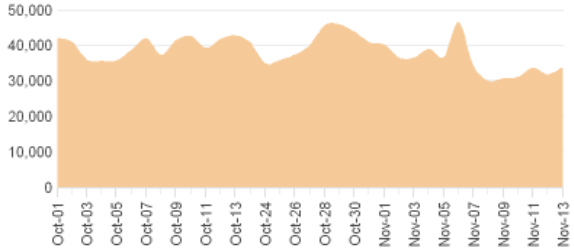
SAN Health - Port Performance Imbalances



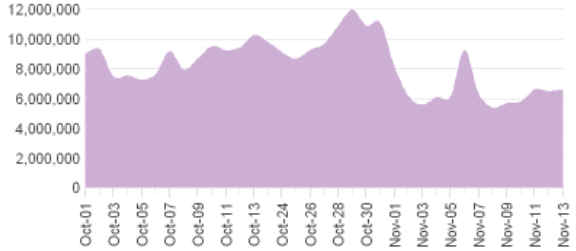
Transmit and Receive MB



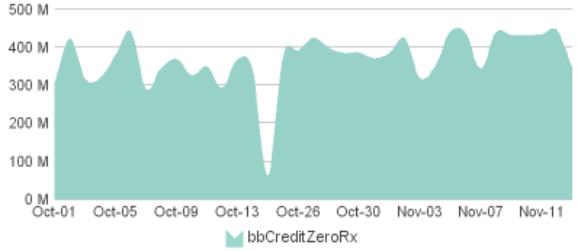
Total Traffic Frame Rate



Buffer to Buffer Credit Trend



bbCreditZero (Slow Drain) Trend



 Click on the screen shot above to return to the report description.

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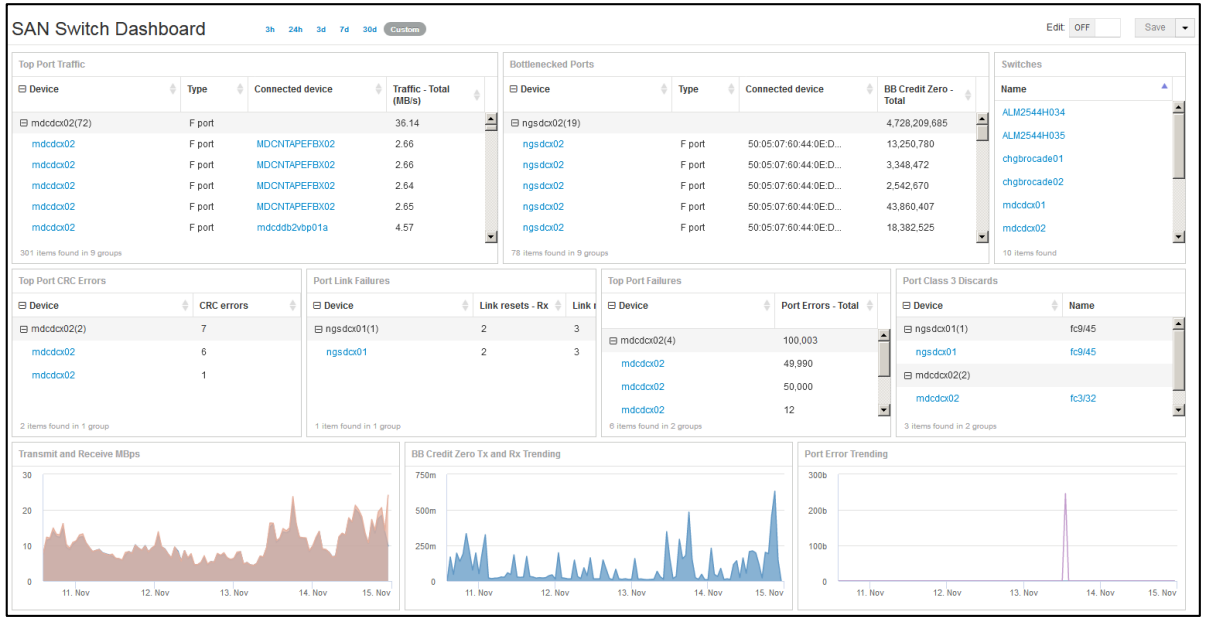
7.8 WebUI – SAN Switch Dashboard

Description: This WebUI based dashboard shows SAN Switch traffic and port statistics. On the top left are Top Port Traffic and Bottlenecked Ports (Based on Slow Drain Policies configured in OCI). At the far right is a list of switches with drill down capability. In the middle are inventory lists of port errors and failure conditions. At the bottom are trending for traffic, BB credit zero and port errors.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Switch	Name of the SAN switch discovered and monitored by OCI.
Device	Same as Switch.
Type	Type of port, e.g. F-Port, E-Port, etc.
Connected device	Name of the device connected to the switch port.
Traffic – Total (MB/s)	Data transmitted + received in MB/second for the user selected time period.
BB Credit Zero – Total	This is a counter that indicates that all buffers are allocated. This number is used to identify potential congestion on a port.
CRC errors	The number (error rate) of cyclic redundancy check (CRC) errors per second for the user selected time period.
Link resets	The number (error rate) transmit and/or receive link reset errors per second for the user selected time period.
Port Errors – Total	Total number of port errors for the user selected time period.
Class 3 Discards	The number of Class 3 frames discarded due to timeout for the user selected time period.
Rx Traffic / Tx Traffic	Data transmitted and/or received in MB/second for the user selected time period.
Date	The date field applied to trending charts and selectable by the user.

Click on the report screen shot above to view an enlarged image.

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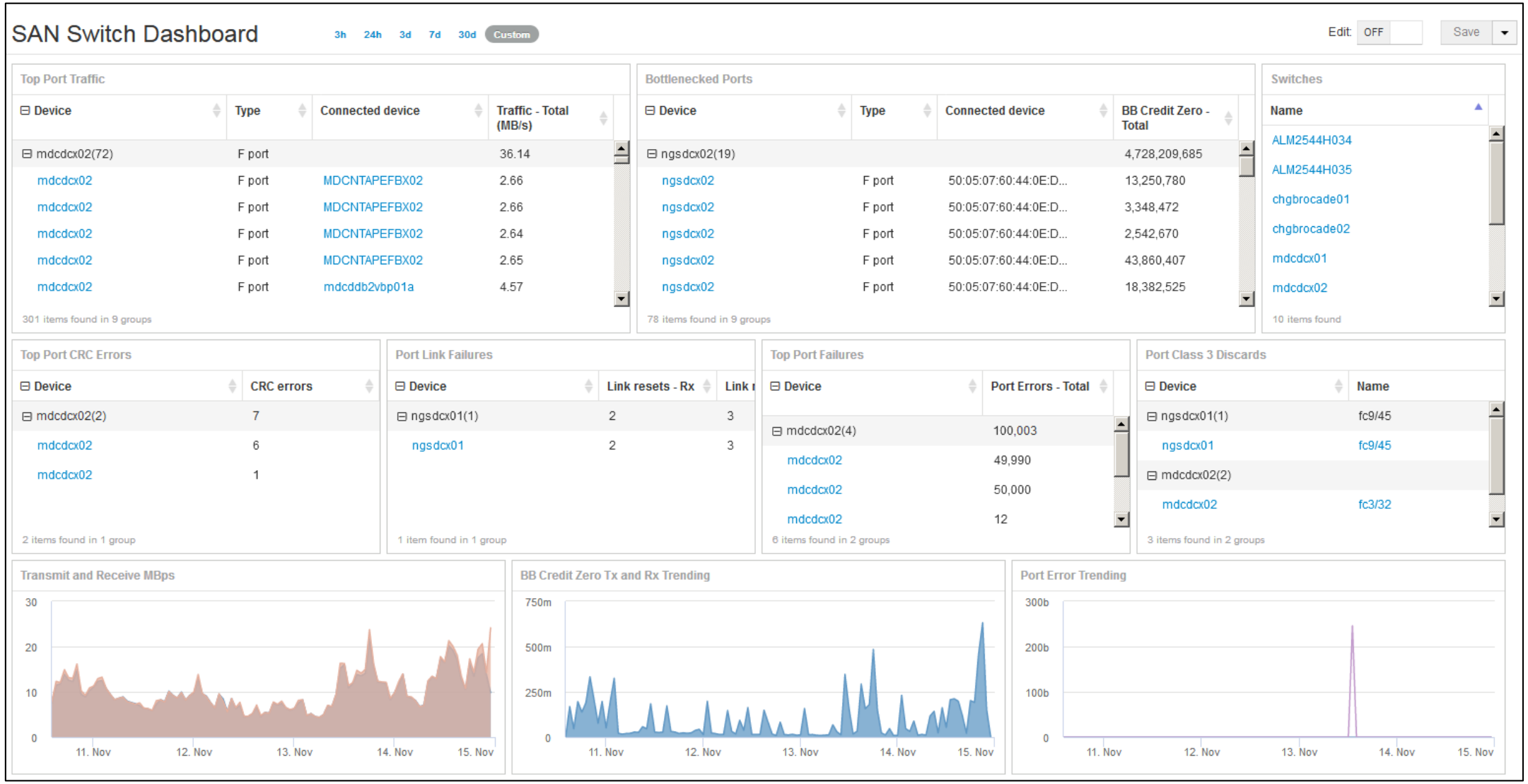

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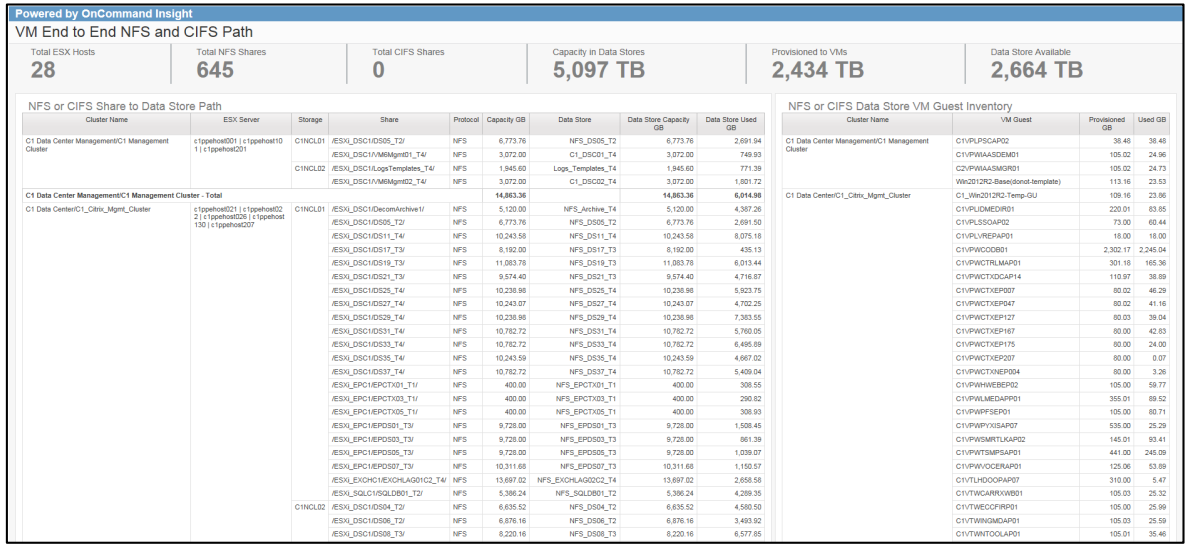
7.9 VM End to End NFS and CIFS Path

Description: This report shows VM End to End path for NFS and CIFS Datastores. A summary of capacity related metrics is visible at the top. The table on the left includes Cluster, ESX Server, Storage Device, Share, Protocol, and Datastore capacity metrics. The table on the right shows Cluster, VM Guest and VM Guest provisioned capacity.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Cluster Name	Name of the ESX Cluster monitored by OCI.
ESX Server	Name of the ESX Host monitored by OCI.
Storage	Name of the storage arrays monitored by OCI.
Share	Name of the NFS or CIFS share associated with the Internal Volume and NetApp Cluster/HA Pair.
Protocol	CIFS or NFS.
Capacity GB	Usable Capacity in GB of the Internal Volume containing the share.
Data Store	Name of the Data Store associated with the ESX Server.
Data Store Capacity GB	Capacity Allocated in TB to a Data Store.
Data Store Used GB	Capacity in USE by the Data Store. This is capacity that is provisioned to VMDKs and presented to Virtual Machines.
VM Guest	Name of the Virtual Machine associated with the ESX Server.
Provisioned GB	Virtual Machine Provisioned Capacity in (GB).
Used GB	Virtual Machine Used Capacity (GB).

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VM End to End NFS and CIFS Path

Total ESX Hosts	Total NFS Shares	Total CIFS Shares	Capacity in Data Stores	Provisioned to VMs	Data Store Available
28	645	0	5,097 TB	2,434 TB	2,664 TB

NFS or CIFS Share to Data Store Path

Cluster Name	ESX Server	Storage	Share	Protocol	Capacity GB	Data Store	Data Store Capacity GB	Data Store Used GB
C1 Data Center Management/C1 Management Cluster	c1ppehost001 | c1ppehost101 | c1ppehost201	C1NCL01	/ESXi_DSC1/DS05_T2/	NFS	6,773.76	NFS_DS05_T2	6,773.76	2,691.94
			/ESXi_DSC1/VM6Mgmt01_T4/	NFS	3,072.00	C1_DSC01_T4	3,072.00	749.93
		C1NCL02	/ESXi_DSC1/LogsTemplates_T4/	NFS	1,945.60	Logs_Templates_T4	1,945.60	771.39
			/ESXi_DSC1/VM6Mgmt02_T4/	NFS	3,072.00	C1_DSC02_T4	3,072.00	1,801.72
C1 Data Center Management/C1 Management Cluster - Total					**14,863.36**		**14,863.36**	**6,014.98**
C1 Data Center/C1_Citrix_Mgmt_Cluster	c1ppehost021 | c1ppehost022 | c1ppehost026 | c1ppehost130 | c1ppehost207	C1NCL01	/ESXi_DSC1/DecomArchive1/	NFS	5,120.00	NFS_Archive_T4	5,120.00	4,387.26
			/ESXi_DSC1/DS05_T2/	NFS	6,773.76	NFS_DS05_T2	6,773.76	2,691.50
			/ESXi_DSC1/DS11_T4/	NFS	10,243.58	NFS_DS11_T4	10,243.58	8,075.18
			/ESXi_DSC1/DS17_T3/	NFS	8,192.00	NFS_DS17_T3	8,192.00	435.13
			/ESXi_DSC1/DS19_T3/	NFS	11,083.78	NFS_DS19_T3	11,083.78	6,013.44
			/ESXi_DSC1/DS21_T3/	NFS	9,574.40	NFS_DS21_T3	9,574.40	4,716.87
			/ESXi_DSC1/DS25_T4/	NFS	10,238.98	NFS_DS25_T4	10,238.98	5,923.75
			/ESXi_DSC1/DS27_T4/	NFS	10,243.07	NFS_DS27_T4	10,243.07	4,702.25
			/ESXi_DSC1/DS29_T4/	NFS	10,238.98	NFS_DS29_T4	10,238.98	7,383.55
			/ESXi_DSC1/DS31_T4/	NFS	10,782.72	NFS_DS31_T4	10,782.72	5,760.05
			/ESXi_DSC1/DS33_T4/	NFS	10,782.72	NFS_DS33_T4	10,782.72	6,495.89
			/ESXi_DSC1/DS35_T4/	NFS	10,243.59	NFS_DS35_T4	10,243.59	4,667.02
			/ESXi_DSC1/DS37_T4/	NFS	10,782.72	NFS_DS37_T4	10,782.72	5,409.04
			/ESXi_EPC1/EPCTX01_T1/	NFS	400.00	NFS_EPCTX01_T1	400.00	308.55
			/ESXi_EPC1/EPCTX03_T1/	NFS	400.00	NFS_EPCTX03_T1	400.00	290.82
			/ESXi_EPC1/EPCTX05_T1/	NFS	400.00	NFS_EPCTX05_T1	400.00	308.93
			/ESXi_EPC1/EPDS01_T3/	NFS	9,728.00	NFS_EPDS01_T3	9,728.00	1,508.45
			/ESXi_EPC1/EPDS03_T3/	NFS	9,728.00	NFS_EPDS03_T3	9,728.00	861.39
			/ESXi_EPC1/EPDS05_T3/	NFS	9,728.00	NFS_EPDS05_T3	9,728.00	1,039.07
			/ESXi_EPC1/EPDS07_T3/	NFS	10,311.68	NFS_EPDS07_T3	10,311.68	1,150.57
			/ESXi_EXCHC1/EXCHLAG01C2_T4/	NFS	13,697.02	NFS_EXCHLAG02C2_T4	13,697.02	2,658.58
			/ESXi_SQLC1/SQLDB01_T2/	NFS	5,386.24	NFS_SQLDB01_T2	5,386.24	4,289.35
		C1NCL02	/ESXi_DSC1/DS04_T2/	NFS	6,635.52	NFS_DS04_T2	6,635.52	4,580.50
			/ESXi_DSC1/DS06_T2/	NFS	6,876.16	NFS_DS06_T2	6,876.16	3,493.92
			/ESXi_DSC1/DS08_T3/	NFS	8,220.16	NFS_DS08_T3	8,220.16	6,577.85

NFS or CIFS Data Store VM Guest Inventory

Cluster Name	VM Guest	Provisioned GB	Used GB
C1 Data Center Management/C1 Management Cluster	C1VPLPSCAP02	38.48	38.48
	C1VPWIAASDEM01	105.02	24.96
	C2VPWIAASMGR01	105.02	24.73
	Win2012R2-Base(donot-template)	113.16	23.53
C1 Data Center/C1_Citrix_Mgmt_Cluster	C1_Win2012R2-Temp-GU	109.16	23.86
	C1VPLIDMEDIR01	220.01	83.85
	C1VPLSSOAP02	73.00	60.44
	C1VPLVREPAP01	18.00	18.00
	C1VPWCODB01	2,302.17	2,245.04
	C1VPWCTRLMAP01	301.18	165.36
	C1VPWCTXDCAP14	110.97	38.89
	C1VPWCTXEP007	80.02	46.29
	C1VPWCTXEP047	80.02	41.16
	C1VPWCTXEP127	80.03	39.04
	C1VPWCTXEP167	80.00	42.83
	C1VPWCTXEP175	80.00	24.00
	C1VPWCTXEP207	80.00	0.07
	C1VPWCTXNEP004	80.00	3.26
	C1VPWHWEBEP02	105.00	59.77
	C1VPWLMEDAPP01	355.01	89.52
	C1VPWPFSEP01	105.00	80.71
	C1VPWPYXISAP07	535.00	25.29
	C1VPWSMRTLKAP02	145.01	93.41
	C1VPWTSMPSAP01	441.00	245.09
	C1VPWVOCERAP01	125.06	53.89
	C1VTLHDOOPAP07	310.00	5.47
	C1VTWCARRXWB01	105.03	25.32
	C1VTWECCFIRP01	105.00	25.99
	C1VTWINGMDAP01	105.03	25.59
	C1VTWNTOOLAP01	105.01	35.46

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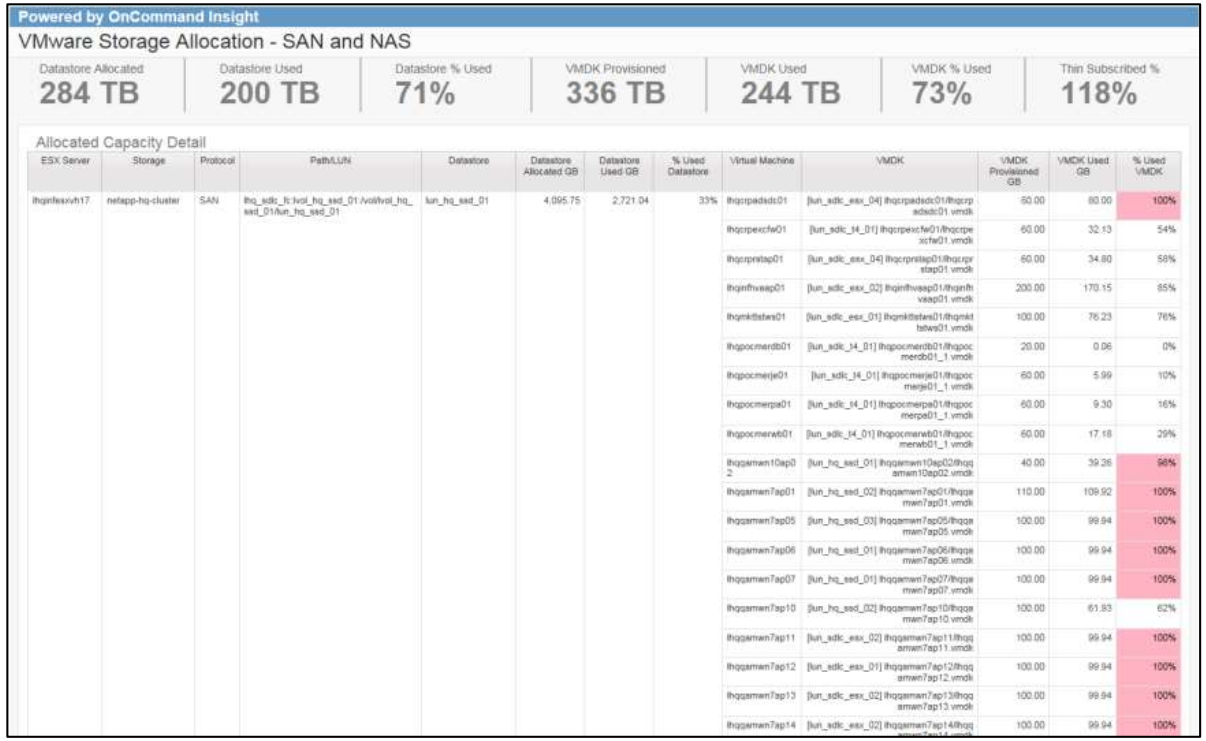
7.10 VMware Storage Allocation – SAN and NAS

Description: This report shows Vmware storage allocation by ESX server and associated VM Guests. Both SAN and NAS paths are analyzed. VMDK's with utilization % greater than 85% is highlighted.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
ESX Server	Name of the ESX Server as reported by the Vcenter discovered by OCI.
Storage	Name of the Storage Array discovered by OCI.
Protocol	Storage Protocol used to map storage to datastores (e.g. SAN, NFS, CIFS).
Path/LUN	NFS Path or Name of the LUN associated with the Datastore.
Datastore	Name of the Datastore associated with the ESX Server.
Datastore Allocated GB	Capacity in GB allocated to Datastores.
Datastore Used GB	Capacity that is Provisioned to VM Guests from Datastores.
% Datastore Used	Datastore Used GB / Datastore Allocated GB.
Virtual Machine	Name of the VM Guest that is associated with each ESX Server.
VMDK	Name of the Virtual Disk associated with each VM Guest.
VMDK Provisioned GB	Capacity in GB provisioned from a Datastore to a VMDK.
VMDK Used GB	Capacity in GB that is used as reported by the VMDK.
% Used VMDK	VMDK Used GB / VMDK Provisioned GB.

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VMware Storage Allocation - SAN and NAS

Datastore Allocated	Datastore Used	Datastore % Used	VMDK Provisioned	VMDK Used	VMDK % Used	Thin Subscribed %
284 TB	200 TB	71%	336 TB	244 TB	73%	118%

Allocated Capacity Detail

ESX Server	Storage	Protocol	Path/LUN	Datastore	Datastore Allocated GB	Datastore Used GB	% Used Datastore	Virtual Machine	VMDK	VMDK Provisioned GB	VMDK Used GB	% Used VMDK
lhqinfesxvh17	netapp-hq-cluster	SAN	lhq_sdlc_fc:/vol/vol_hq_ssd_01 /vol/vol_hq_ssd_01/lun_hq_ssd_01	lun_hq_ssd_01	4,095.75	2,721.04	33%	lhqcrpadsdc01	[lun_sdlc_esx_04] lhqcrpadsdc01/lhqcrpadsdc01.vmdk	60.00	60.00	100%
								lhqcrpexcfw01	[lun_sdlc_f4_01] lhqcrpexcfw01/lhqcrpexcfw01.vmdk	60.00	32.13	54%
								lhqcrpratap01	[lun_sdlc_esx_04] lhqcrpratap01/lhqcrpratap01.vmdk	60.00	34.80	58%
								lhqinfhvaap01	[lun_sdlc_esx_02] lhqinfhvaap01/lhqinfhvaap01.vmdk	200.00	170.15	85%
								lhqmktbtws01	[lun_sdlc_esx_01] lhqmktbtws01/lhqmktbtws01.vmdk	100.00	76.23	76%
								lhqpocmerdb01	[lun_sdlc_f4_01] lhqpocmerdb01/lhqpocmerdb01_1.vmdk	20.00	0.06	0%
								lhqpocmerje01	[lun_sdlc_f4_01] lhqpocmerje01/lhqpocmerje01_1.vmdk	60.00	5.99	10%
								lhqpocmerpa01	[lun_sdlc_f4_01] lhqpocmerpa01/lhqpocmerpa01_1.vmdk	60.00	9.30	16%
								lhqpocmerwb01	[lun_sdlc_f4_01] lhqpocmerwb01/lhqpocmerwb01_1.vmdk	60.00	17.18	29%
								lhqqamwn10ap02	[lun_hq_ssd_01] lhqqamwn10ap02/lhqqamwn10ap02.vmdk	40.00	39.26	98%
								lhqqamwn7ap01	[lun_hq_ssd_02] lhqqamwn7ap01/lhqqamwn7ap01.vmdk	110.00	109.92	100%
								lhqqamwn7ap05	[lun_hq_ssd_03] lhqqamwn7ap05/lhqqamwn7ap05.vmdk	100.00	99.94	100%
								lhqqamwn7ap06	[lun_hq_ssd_01] lhqqamwn7ap06/lhqqamwn7ap06.vmdk	100.00	99.94	100%
								lhqqamwn7ap07	[lun_hq_ssd_01] lhqqamwn7ap07/lhqqamwn7ap07.vmdk	100.00	99.94	100%
								lhqqamwn7ap10	[lun_hq_ssd_02] lhqqamwn7ap10/lhqqamwn7ap10.vmdk	100.00	61.83	62%
								lhqqamwn7ap11	[lun_sdlc_esx_02] lhqqamwn7ap11/lhqqamwn7ap11.vmdk	100.00	99.94	100%
								lhqqamwn7ap12	[lun_sdlc_esx_01] lhqqamwn7ap12/lhqqamwn7ap12.vmdk	100.00	99.94	100%
								lhqqamwn7ap13	[lun_sdlc_esx_02] lhqqamwn7ap13/lhqqamwn7ap13.vmdk	100.00	99.94	100%
								lhqqamwn7ap14	[lun_sdlc_esx_02] lhqqamwn7ap14/lhqqamwn7ap14.vmdk	100.00	99.94	100%

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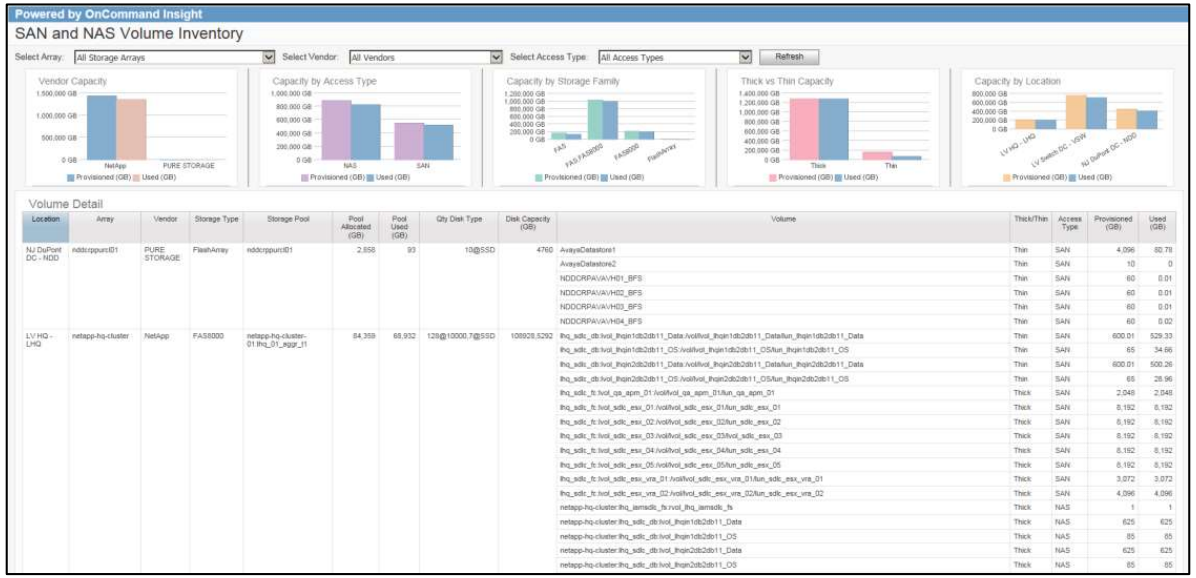
7.11 SAN and NAS Volume Inventory

Description: This report shows volumes (both SAN and NAS) and the overlying and underlying infrastructure from a storage perspective. Drop-downs are available at the top of the page to filter on Storage Name, Vendor or Access Type. Summary charts show capacity by vendor, access type, storage family, thin vs thick and by location.

Prerequisites: Annotations/definitions are necessary for Data Center. This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Location	Data Center annotation configured in OCI and assigned to storage arrays, switches or hosts.
Array	Name of the storage array discovered and monitored by OCI.
Vendor	Name of the manufacturer of the storage array.
Storage Type	Type of storage or storage family.
Storage Pool	Name of the storage pool associated with the storage array discovered by OCI.
Pool Allocated (GB)	Post-RAID Usable Capacity in GB as reported by the Storage Pool or Aggregate.
Pool Used (GB)	The amount of usable capacity GB IN USE on the storage pool. This includes the capacity consumed by internal volumes, volumes, Snapshot Reserve, and other storage efficiency technology overheads.
Qty Disk Type	Number of disks and speed, e.g. 10000, 15000, 7200 or SSD.
Disk Capacity (GB)	Aggregate raw capacity of the disks in GB.
Volume	Name of the volume associated with the storage array discovered in OCI.
Thick/Thin	Identifies the volume as thin provisioned or thick provisioned.
Access Type	SAN or NAS volume.
Provisioned (GB)	The capacity of volumes accessed by hosts, used for replication and volumes that are masked but no access path to them exists.
Used (GB)	Used Capacity in TB, shows block written or data files written if from thin provisioned device, will equal Allocated if thick provisioned.

Click on the report screen shot above to view an enlarged image.

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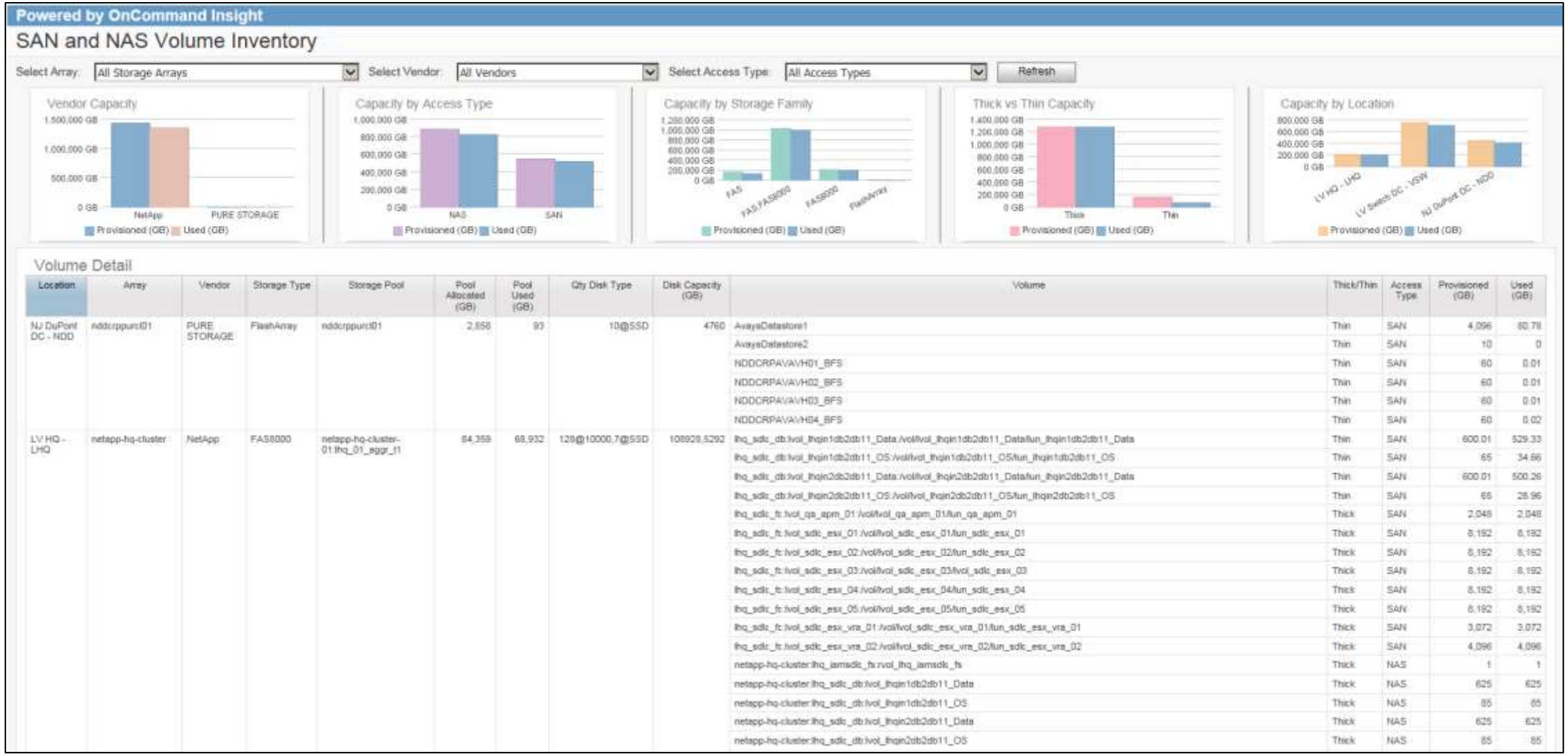

Location	Array	Vendor	Storage Type	Storage Pool	Pool Allocated (GB)	Pool Used (GB)	Qty Disk Type	Disk Capacity (GB)	Volume	Thick/Thin	Access Type	Provisioned (GB)	Used (GB)
NJ DuPont DC - NDD	nddcrppurcl01	PURE STORAGE	FlashArray	nddcrppurcl01	2,858	93	10@SSD	4760	AvayaDatastore1	Thin	SAN	4,096	60.78
									AvayaDatastore2	Thin	SAN	10	0
									NDDCRPAVA\H01_BFS	Thin	SAN	60	0.01
									NDDCRPAVA\H02_BFS	Thin	SAN	60	0.01
									NDDCRPAVA\H03_BFS	Thin	SAN	60	0.01
									NDDCRPAVA\H04_BFS	Thin	SAN	60	0.02
LV HQ - LHQ	netapp-hq-cluster	NetApp	FAS8000	netapp-hq-cluster-01:lhq_01_aggr_f1	84,359	68,932	128@10000,7@SSD	108928,5292	lhq_sdlc_db:/vol/vol_lhqin1db2db11_Data:/vol/vol_lhqin1db2db11_Data/lun_lhqin1db2db11_Data	Thin	SAN	600.01	529.33
									lhq_sdlc_db:/vol/vol_lhqin1db2db11_OS:/vol/vol_lhqin1db2db11_OS/lun_lhqin1db2db11_OS	Thin	SAN	65	34.66
									lhq_sdlc_db:/vol/vol_lhqin2db2db11_Data:/vol/vol_lhqin2db2db11_Data/lun_lhqin2db2db11_Data	Thin	SAN	600.01	500.26
									lhq_sdlc_db:/vol/vol_lhqin2db2db11_OS:/vol/vol_lhqin2db2db11_OS/lun_lhqin2db2db11_OS	Thin	SAN	65	28.96
									lhq_sdlc_fs:/vol_qa_apm_01:/vol/vol_qa_apm_01/lun_qa_apm_01	Thick	SAN	2,048	2,048
									lhq_sdlc_fs:/vol_sdlc_esx_01:/vol/vol_sdlc_esx_01/lun_sdlc_esx_01	Thick	SAN	8,192	8,192
									lhq_sdlc_fs:/vol_sdlc_esx_02:/vol/vol_sdlc_esx_02/lun_sdlc_esx_02	Thick	SAN	8,192	8,192
									lhq_sdlc_fs:/vol_sdlc_esx_03:/vol/vol_sdlc_esx_03/lvol_sdlc_esx_03	Thick	SAN	8,192	8,192
									lhq_sdlc_fs:/vol_sdlc_esx_04:/vol/vol_sdlc_esx_04/lun_sdlc_esx_04	Thick	SAN	8,192	8,192
									lhq_sdlc_fs:/vol_sdlc_esx_05:/vol/vol_sdlc_esx_05/lun_sdlc_esx_05	Thick	SAN	8,192	8,192
									lhq_sdlc_fs:/vol_sdlc_esx_vra_01:/vol/vol_sdlc_esx_vra_01/lun_sdlc_esx_vra_01	Thick	SAN	3,072	3,072
									lhq_sdlc_fs:/vol_sdlc_esx_vra_02:/vol/vol_sdlc_esx_vra_02/lun_sdlc_esx_vra_02	Thick	SAN	4,096	4,096
									netapp-hq-cluster:lhq_iamsdlc_fs:/vol_lhq_iamsdlc_fs	Thick	NAS	1	1
									netapp-hq-cluster:lhq_sdlc_db:/vol_lhqin1db2db11_Data	Thick	NAS	625	625
									netapp-hq-cluster:lhq_sdlc_db:/vol_lhqin1db2db11_OS	Thick	NAS	85	85
									netapp-hq-cluster:lhq_sdlc_db:/vol_lhqin2db2db11_Data	Thick	NAS	625	625
									netapp-hq-cluster:lhq_sdlc_db:/vol_lhqin2db2db11_OS	Thick	NAS	85	85

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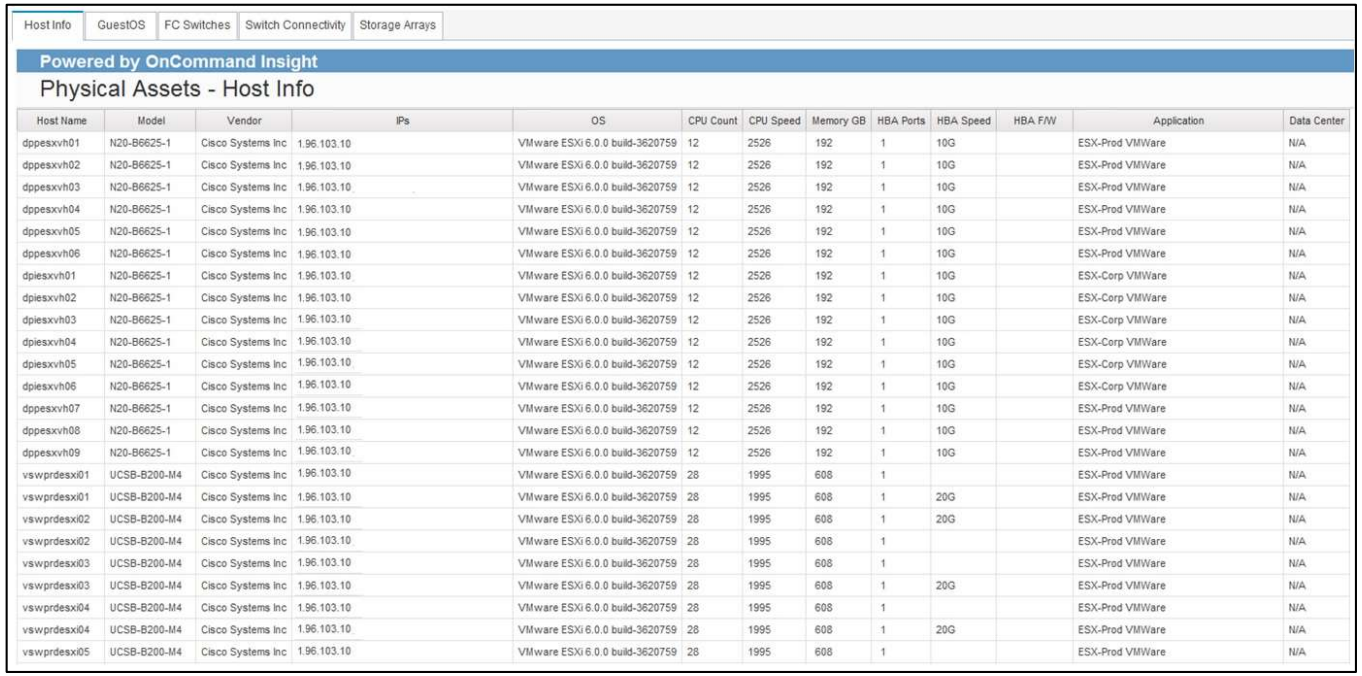
7.12 Physical Assets

☐ **Select This Report**

Description: This report shows a comprehensive list of devices discovered and monitored by OCI. Host, VM Guest OS, FC Switches, Switch Connectivity and Storage Array detail is analyzed and enumerated.

Prerequisites: Annotations/definitions are necessary for costs, Application, Business Unit, and Service Level/Tier. Requires secondary ETL script to run nightly. There is a Non-ETL version as well. This is only available in OnCommand Insight versions 7.3 or later. Requires licenses for OCI Discover, Perform and Plan.



Host Info | GuestOS | FC Switches | Switch Connectivity | Storage Arrays

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Physical Assets - Host Info

Host Name	Model	Vendor	IPs	OS	CPU Count	CPU Speed	Memory GB	HBA Ports	HBA Speed	HBA F/W	Application	Data Center
dppesxvh01	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh02	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh03	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh04	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh05	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh06	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dpiesxvh01	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dpiesxvh02	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dpiesxvh03	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dpiesxvh04	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dpiesxvh05	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dpiesxvh06	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dppesxvh07	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh08	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh09	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
vswprdesxi01	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1			ESX-Prod VMWare	N/A
vswprdesxi01	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1	20G		ESX-Prod VMWare	N/A
vswprdesxi02	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1	20G		ESX-Prod VMWare	N/A
vswprdesxi02	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1			ESX-Prod VMWare	N/A
vswprdesxi03	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1			ESX-Prod VMWare	N/A
vswprdesxi03	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1	20G		ESX-Prod VMWare	N/A
vswprdesxi04	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1			ESX-Prod VMWare	N/A
vswprdesxi04	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1	20G		ESX-Prod VMWare	N/A
vswprdesxi05	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1			ESX-Prod VMWare	N/A

Data Dictionary

There is no data dictionary for this report. The fields are self-explanatory

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Host Info | GuestOS | FC Switches | Switch Connectivity | Storage Arrays

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Physical Assets - Host Info

Host Name	Model	Vendor	IPs	OS	CPU Count	CPU Speed	Memory GB	HBA Ports	HBA Speed	HBA F/W	Application	Data Center
dppesxvh01	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh02	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh03	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh04	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh05	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh06	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dpiesxvh01	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dpiesxvh02	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dpiesxvh03	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dpiesxvh04	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dpiesxvh05	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dpiesxvh06	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Corp VMWare	N/A
dppesxvh07	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh08	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
dppesxvh09	N20-B6625-1	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	12	2526	192	1	10G		ESX-Prod VMWare	N/A
vswprdesxi01	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1			ESX-Prod VMWare	N/A
vswprdesxi01	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1	20G		ESX-Prod VMWare	N/A
vswprdesxi02	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1	20G		ESX-Prod VMWare	N/A
vswprdesxi02	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1			ESX-Prod VMWare	N/A
vswprdesxi03	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1			ESX-Prod VMWare	N/A
vswprdesxi03	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1	20G		ESX-Prod VMWare	N/A
vswprdesxi04	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1			ESX-Prod VMWare	N/A
vswprdesxi04	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1	20G		ESX-Prod VMWare	N/A
vswprdesxi05	UCSB-B200-M4	Cisco Systems Inc	1.96.103.10	VMware ESXi 6.0.0 build-3620759	28	1995	608	1			ESX-Prod VMWare	N/A

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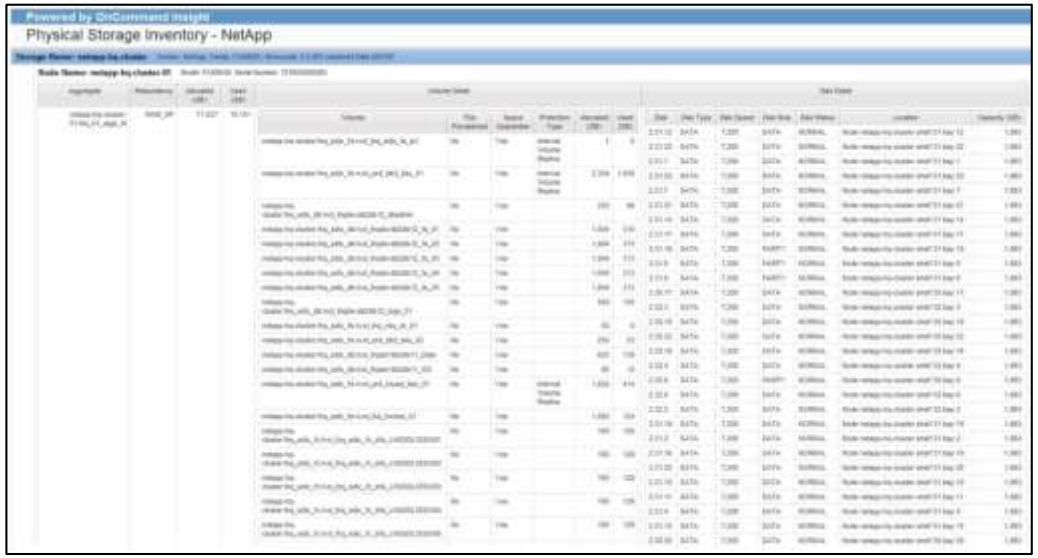
7.13 Physical Storage Inventory – NetApp

Description: This report shows a list of NetApp devices discovered and monitored by OCI. The list includes the cluster, node, aggregate, volume and disk capacity details.

Prerequisites: This is only available in OnCommand Insight versions 7.3 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Storage Cluster	Name of the NetApp Storage Array discovered in OCI.
Node Name	Name of the Node associated with the NetApp Storage Array discovered in OCI.
Aggregate	Name of the Storage Pool or Aggregate associated with the Node.
Redundancy	Storage Protection technology (RAID) associated with the Aggregate.
Allocated (GB)	Amount of Capacity in GB that is allocated to the Aggregate.
Used (GB)	Used Capacity in GB as reported by the storage pool. Shows Data Written if Space Guarantee is not enabled.
Volume	Name of the Volume associated with the NetApp Storage Array.
Thin Provisioned	Indicates whether the Volume is Thin or Thick Provisioned.
Space Guarantee	Indicates whether the Volume is using Space Guarantee.
Protection Type	Indicates that a Volume is a Replica Volume.
Disk	Name of the Disk associated with the NetApp Storage Array discovered in OCI.
Disk Type	Type of the Disk (e.g. SAS, SATA, FC, SSD, etc.).
Disk Speed	Speed of the Disk in RPMs (Note: SSD disk types have no speed value).
Disk Status	Status of the Disk (Failed, UnAllocated, Spare, Normal, Other etc.).
Location	Location of the Disk within the Storage Array.
Capacity (GB)	Raw Capacity in GB of the disk.

Click on the report screen shot above to view an enlarged image.

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Physical Storage Inventory - NetApp

Storage Name: netapp-hq-cluster Vendor: NetApp, Family: FAS8000, Microcode: 8.3.2P4 clustered Data ONTAP

Node Name: netapp-hq-cluster-01 Model: FAS8040, Serial Number: 721605000260

Aggregate	Redundancy	Allocated (GB)	Used (GB)
netapp-hq-cluster-01:lhq_01_aggr_t4	RAID_DP	71,527	15,101

Volume Detail

Volume	Thin Provisioned	Space Guarantee	Protection Type	Allocated (GB)	Used (GB)
netapp-hq-cluster:lhq_sdlc_fs:rvol_lhq_sdlc_fs_ls1	No	Yes	Internal Volume Replica	1	0
netapp-hq-cluster:lhq_sdlc_fs:nvol_prd_db2_bku_01	No	Yes	Internal Volume Replica	2,304	1,938
netapp-hq-cluster:lhq_sdlc_db:lvol_lhqdevdb2db12_dbadmin	No	Yes		250	99
netapp-hq-cluster:lhq_sdlc_db:lvol_lhqdevdb2db12_fs_01	No	Yes		1,004	310
netapp-hq-cluster:lhq_sdlc_db:lvol_lhqdevdb2db12_fs_02	No	Yes		1,004	313
netapp-hq-cluster:lhq_sdlc_db:lvol_lhqdevdb2db12_fs_03	No	Yes		1,004	313
netapp-hq-cluster:lhq_sdlc_db:lvol_lhqdevdb2db12_fs_04	No	Yes		1,004	313
netapp-hq-cluster:lhq_sdlc_db:lvol_lhqdevdb2db12_fs_05	No	Yes		1,004	313
netapp-hq-cluster:lhq_sdlc_db:lvol_lhqdevdb2db12_logs_01	No	Yes		500	150
netapp-hq-cluster:lhq_sdlc_fs:nvol_lhq_nbu_dr_01	No	Yes		50	0
netapp-hq-cluster:lhq_sdlc_fs:nvol_prd_db2_bku_02	No	Yes		250	53
netapp-hq-cluster:lhq_sdlc_db:lvol_lhqsb1db2db11_Data	No	Yes		625	139
netapp-hq-cluster:lhq_sdlc_db:lvol_lhqsb1db2db11_OS	No	Yes		85	12
netapp-hq-cluster:lhq_sdlc_fs:nvol_prd_mysql_bku_01	No	Yes	Internal Volume Replica	1,024	414
netapp-hq-cluster:lhq_sdlc_fs:nvol_lhq_homes_01	No	Yes		1,024	124
netapp-hq-cluster:lhq_sdlc_fc:lvol_lhq_sdlc_fc_bfs_LHQSDLCESXi01	No	Yes		160	129
netapp-hq-cluster:lhq_sdlc_fc:lvol_lhq_sdlc_fc_bfs_LHQSDLCESXi02	No	Yes		160	129
netapp-hq-cluster:lhq_sdlc_fc:lvol_lhq_sdlc_fc_bfs_LHQSDLCESXi03	No	Yes		160	129
netapp-hq-cluster:lhq_sdlc_fc:lvol_lhq_sdlc_fc_bfs_LHQSDLCESXi04	No	Yes		160	129
netapp-hq-cluster:lhq_sdlc_fc:lvol_lhq_sdlc_fc_bfs_LHQSDLCESXi05	No	Yes		160	129

Disk Detail

Disk	Disk Type	Disk Speed	Disk Role	Disk Status	Location	Capacity (GB)
2.31.12	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 12	1,863
2.31.22	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 22	1,863
2.31.1	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 1	1,863
2.31.23	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 23	1,863
2.31.7	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 7	1,863
2.31.21	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 21	1,863
2.31.14	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 14	1,863
2.31.17	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 17	1,863
2.31.18	SATA	7,200	PARITY	NORMAL	Node netapp-hq-cluster shelf 31 bay 18	1,863
2.31.0	SATA	7,200	PARITY	NORMAL	Node netapp-hq-cluster shelf 31 bay 0	1,863
2.31.6	SATA	7,200	PARITY	NORMAL	Node netapp-hq-cluster shelf 31 bay 6	1,863
2.30.17	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 30 bay 17	1,863
2.32.3	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 32 bay 3	1,863
2.30.19	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 30 bay 19	1,863
2.30.22	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 30 bay 22	1,863
2.30.16	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 30 bay 16	1,863
2.32.4	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 32 bay 4	1,863
2.30.8	SATA	7,200	PARITY	NORMAL	Node netapp-hq-cluster shelf 30 bay 8	1,863
2.32.6	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 32 bay 6	1,863
2.32.2	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 32 bay 2	1,863
2.31.19	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 19	1,863
2.31.2	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 2	1,863
2.31.16	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 16	1,863
2.31.20	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 20	1,863
2.31.10	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 10	1,863
2.31.11	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 11	1,863
2.31.4	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 4	1,863
2.31.15	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 31 bay 15	1,863
2.30.20	SATA	7,200	DATA	NORMAL	Node netapp-hq-cluster shelf 30 bay 20	1,863

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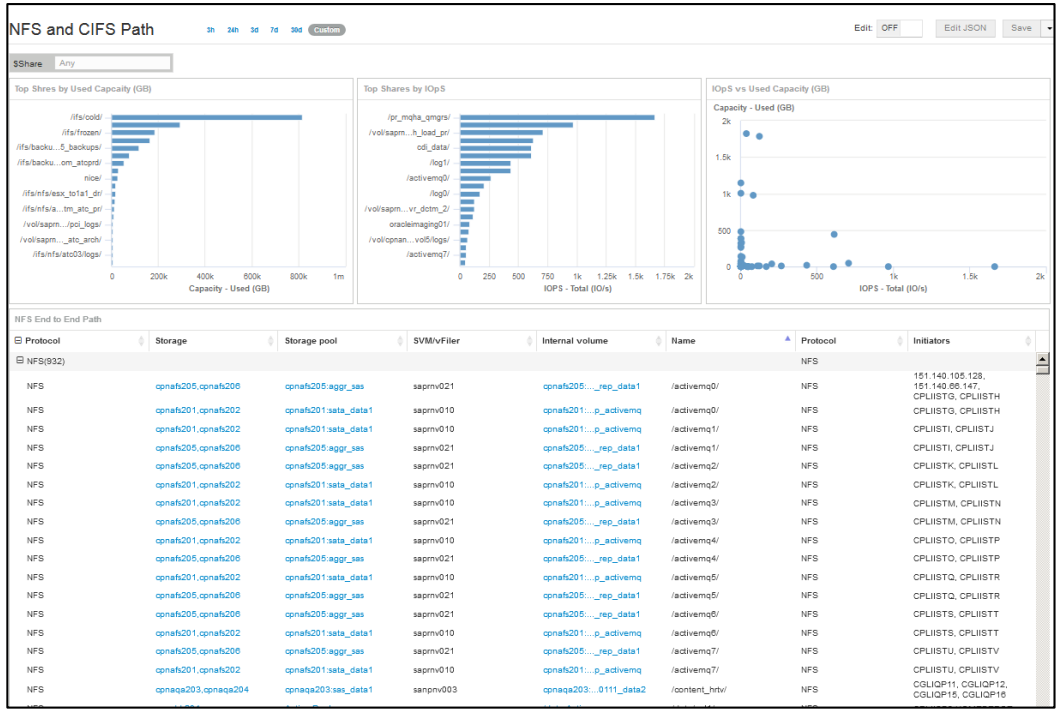
7.14 WebUI – NFS and CIFS Path

Description: This WebUI based dashboard shows NFS and CIFS path data. At the top left, a filter box is available to find individual shares. Top N shares by capacity and IOpS plus a bubble chart showing Capacity vs IOpS comparison. Each bubble represents an individual share. At the bottom is a detailed inventory of the NFS or CIFS path.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
$Shares	Input variable used to filer the dashboard for a specific NFS or CIFS share.
Protocol	Network protocol. (e.g. NFS or CIFS).
Storage	Name of the storage device monitored by OCI.
Storage pool	Name of the storage pool associated with the storage device.
SVM/vFiler	Name of the SVM/vFiler associated with the storage device.
Internal Volume	Name of the Internal Volume or Flexvol associated with the storage pool.
Share / Name	Name of the share associated with the Internal Volume or Flexvol.
Initiators	Name of the Initiator or Host associated with the share.
Date	The date field applied to trending charts and selectable by the user.
IOPS – Total (IO/s)	Sum of Average IOpS (both Read and Write) for the user selected time period.
Capacity – Used (GB)	Used Capacity in GB of the network share. This is derived from the internal volume. If the internal volume contains more than 1 share, then the value cannot be used for individual shares.

Click on the report screen shot above to view an enlarged image.

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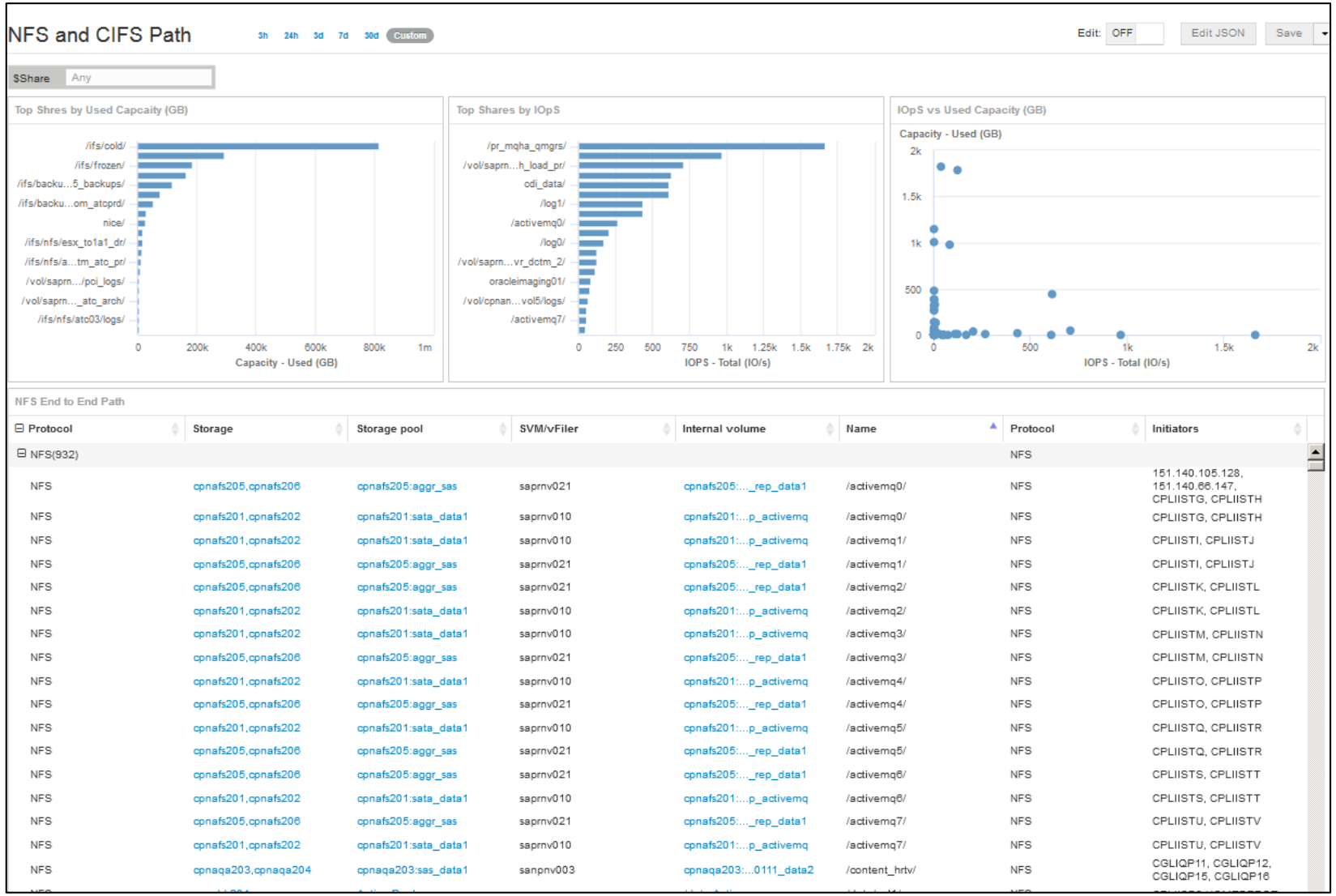

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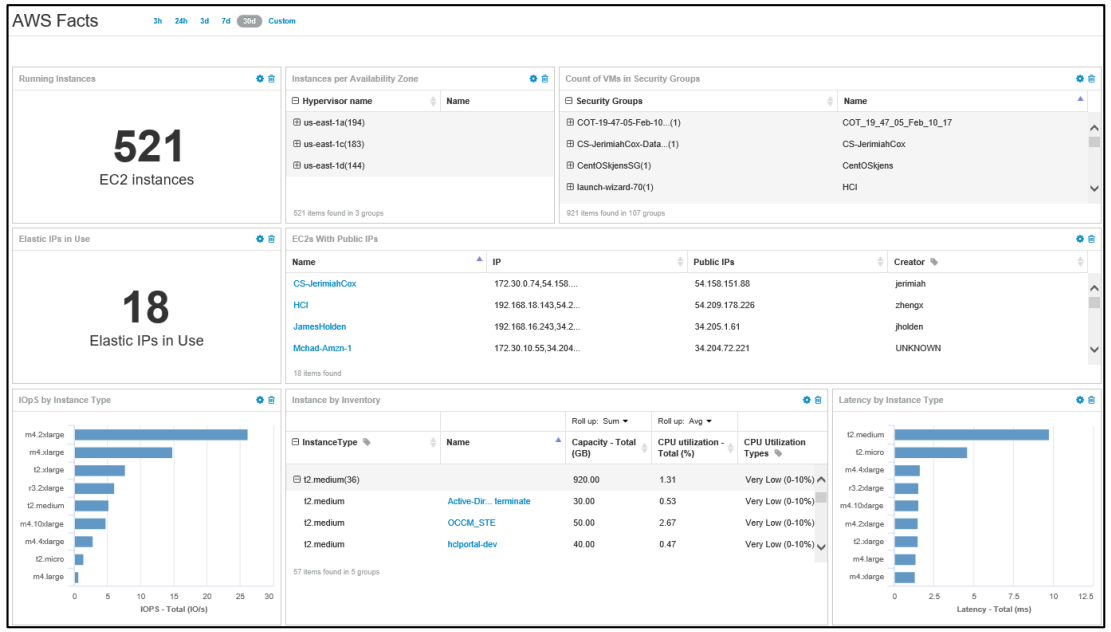
7.15 WebUI – AWS Facts

Description: This WebUI based dashboard facts about the AWS environment monitored by OCI. On the left is a count of EC2 instances (individual virtual machines) and Elastic IPs in use. Instances by Zone, VMs in Security Groups, EC2s with public IPs, Instance Inventory and Top Instances by Latency and IOPS are available.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Hypervisor name	Name of the Hypervisor monitored by OCI where OS = 'Amazon'.
Name / Virtual Machine	An AWS Instance or name of the virtual machine associated with the Hypervisor monitored by OCI via AWS.
EC2	Amazon Elastic Compute Cloud (EC2) forms a central part of Amazon.com's cloud-computing platform, Amazon Web Services (AWS), by allowing users to rent virtual computers on which to run their own computer applications.
Instance Type	The As-Configured virtual machine hosted by AWS and based on provisioned CPU, RAM memory and storage. (e.g. t2.small, t2.medium, t2.large, etc.)
Availability Zone	As part of an AWS Region, an Availability Zone is an isolated location within a region. (e.g. us-east-1, us-east-2, etc.)
Security Group	A security group acts as a virtual firewall that controls the traffic for one or more instances. When you launch an instance, you associate one or more security groups with the instance.
IP	Internal IP Address of the AWS Instance.
Public Ips	Public IP Address of the AWS Instance.
Creator	User ID of the individual who created the instance.
Capacity – Total (GB)	Amount of capacity provisioned to the AWS instance in GB
CPU Utilization – Total (%)	Average CPU Utilization % as reported by the AWS instance over the user selected time period.
CPU Utilization Types	Classification of Utilization % by increments. (e.g. Very Low (0-10%)).
IOPS – Total (IO/s)	Average IOPS as reported by the AWS instance over the user selected time period.
Latency – Total (ms)	Average Latency in milliseconds as reported by the AWS instance over the user selected time period.
Date	The date field applied to trending charts and selectable by the user.

Click on the report screen shot above to view an enlarged image.

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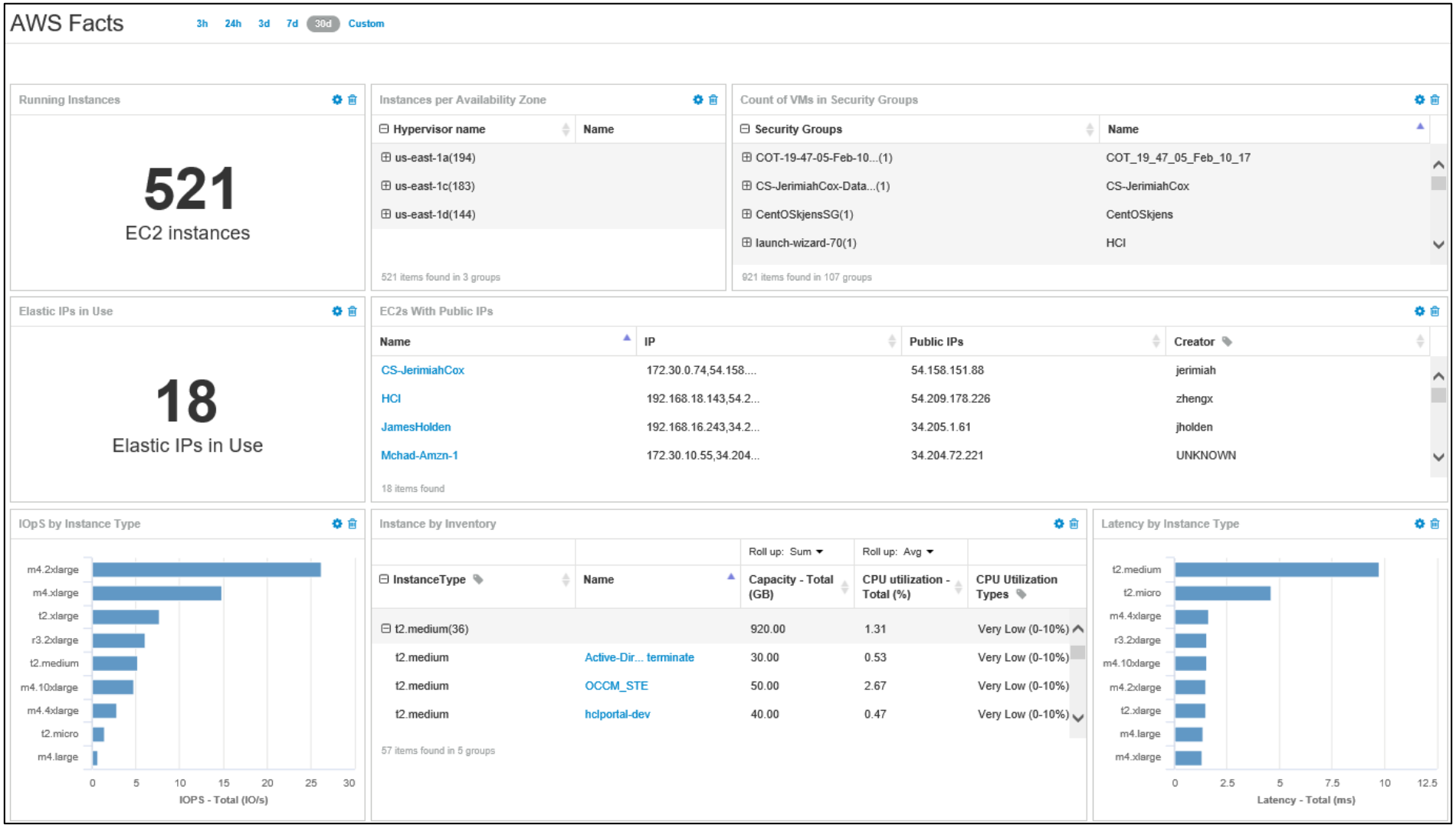

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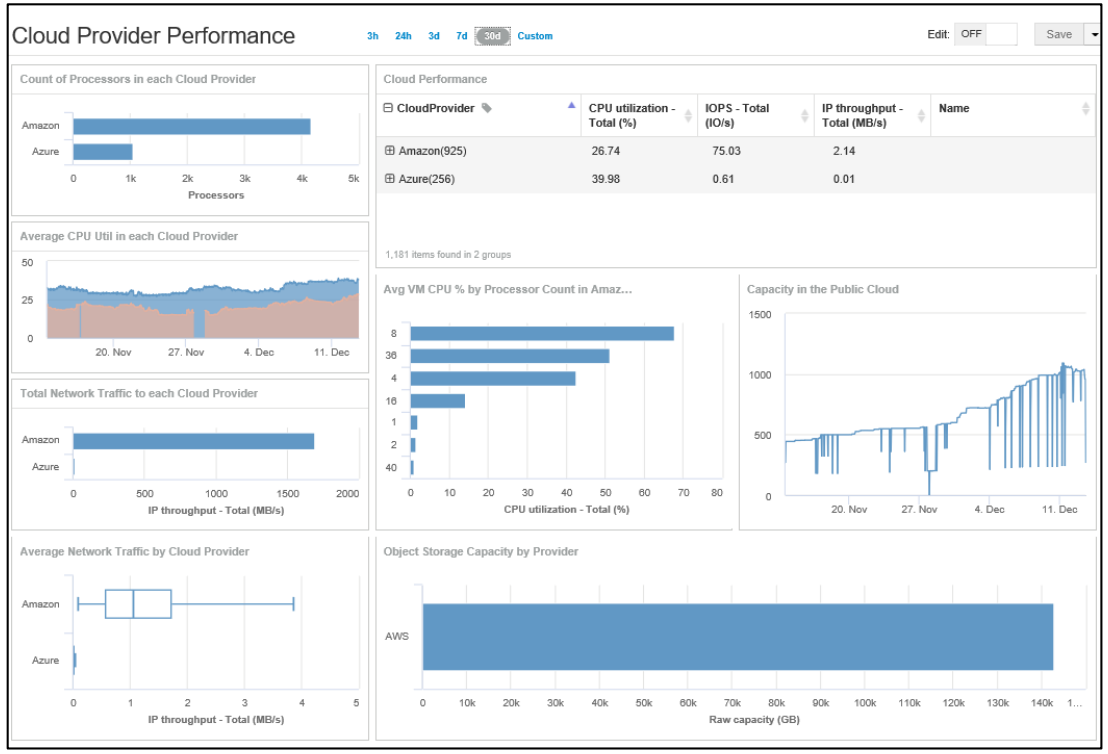
7.16 WebUI – Cloud Provider Performance

Description: This WebUI based dashboard shows Cloud Provider Performance for both AWS and Azure. CPU counts per environment, performance summary, traffic, and capacity are shown in charts and tables.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Cloud Provider Name	The name of the Cloud Provider. (e.g. AWS or Azure).
Name / Instance	The virtual machine or instance name known to AWS or Azure.
Processors	Number of CPUs associated with virtual machine instances.
CPU Utilization – Total (%)	Average CPU Utilization as reported by virtual machine instances for the user selected time period.
IOPS – Total (IO/s)	Average IOPS as reported by virtual machine instances for the user selected time period.
IP throughput – Total (MB/s)	Average Throughput in MB/second as reported by virtual machine instances for the user selected time period.
Raw Capacity (GB)	Raw Provisioned Capacity reported by the Cloud Provider.
Date	The date field applied to trending charts and selectable by the user.

Click on the report screen shot above to view an enlarged image.

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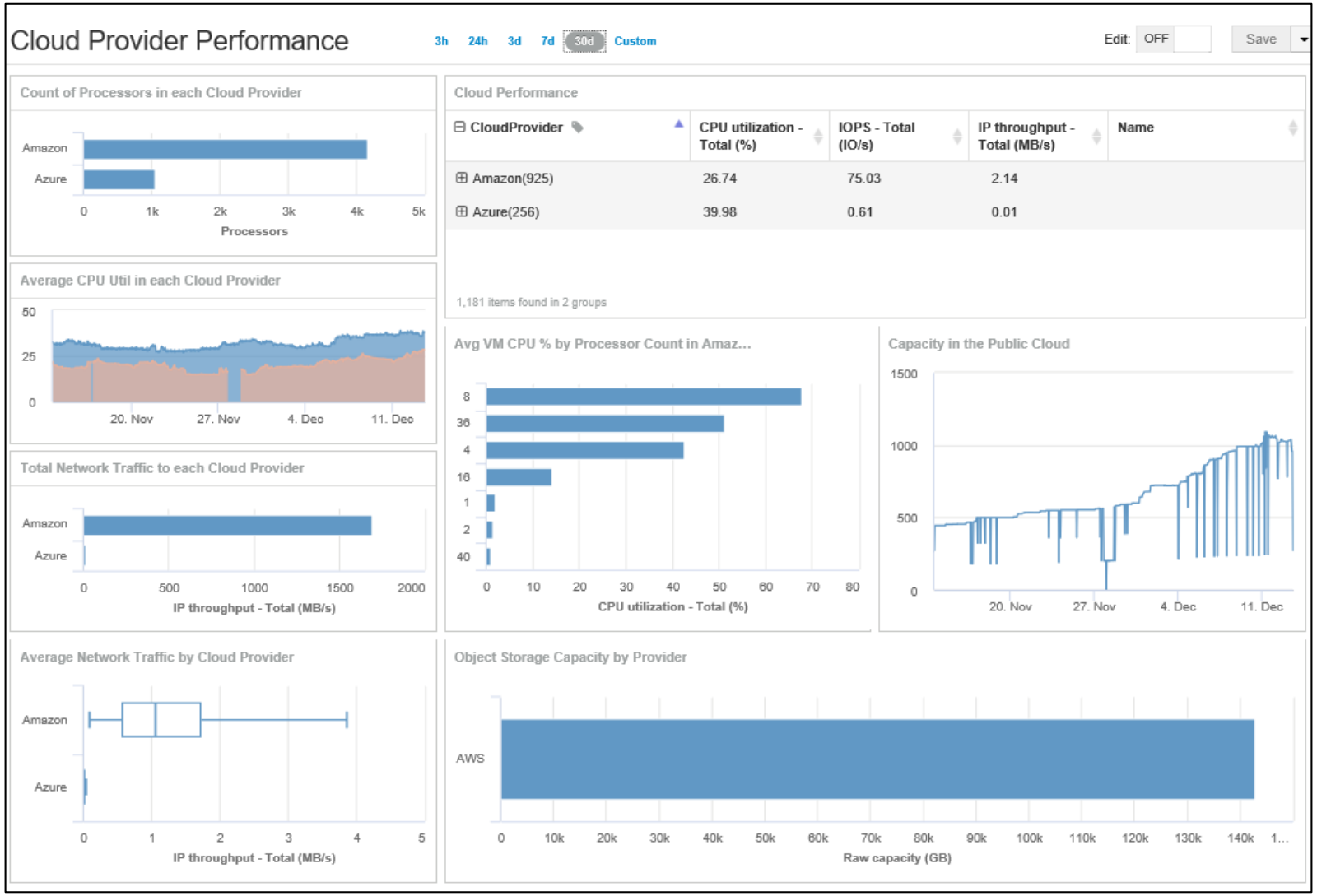

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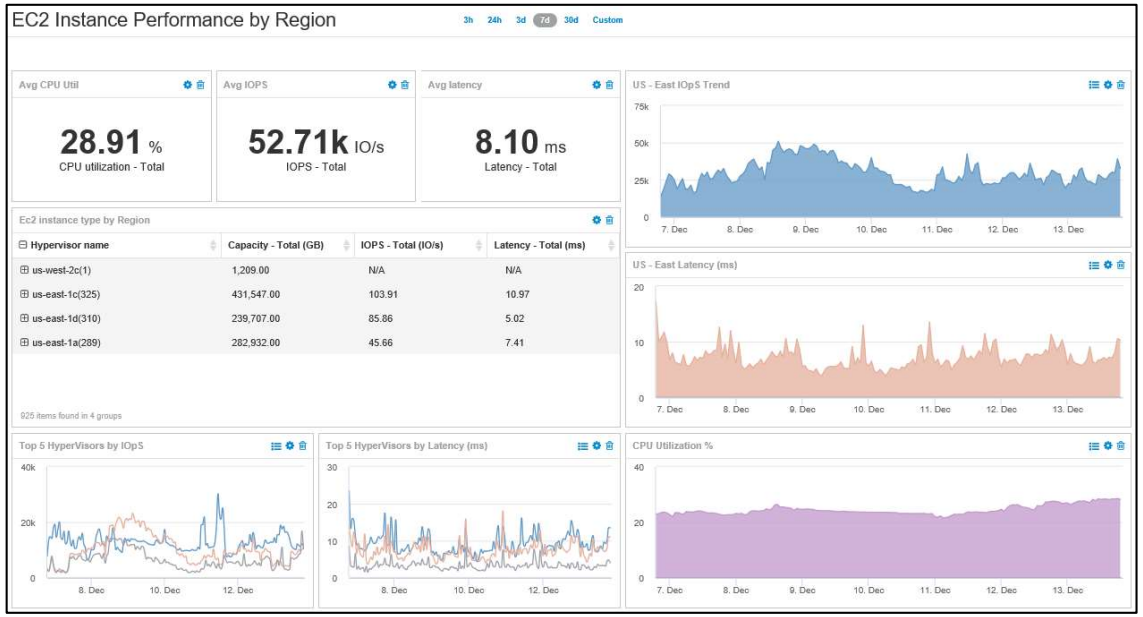
7.17 WebUI – EC2 Instance Performance by Region

Description: This WebUI based dashboard shows EC2 Instance Performance by Region. A summary of counters is shown at top left. EC2 instance inventory is shown by region. Performance charts isolate regions when available.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
AWS Region	Name of the AWS Region. Amazon Web Services (AWS) operates regions in the United States, South America, Europe and Asia Pacific. Each region contains between two and five availability zones that are geographically separate from one another. Regions are connected to one another through the internet.
Hypervisor Name	Name of the Hypervisor monitored by OCI where OS = 'Amazon'.
Date	The date field applied to trending charts and selectable by the user.
Capacity – Total (GB)	Amount of capacity provisioned to the AWS instance in GB.
IOPS – Total (IO/s)	Average IOPS as reported by virtual machine instances for the user selected time period.
Latency – Total (ms)	Average Latency in milliseconds as reported by virtual machine instances for the user selected time period.
CPU Utilization - Total %	Average CPU Utilization as reported by virtual machine instances for the user selected time period.

Click on the report screen shot above to view an enlarged image.

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EC2 Instance Performance by Region

3h 24h 3d 7d 30d Custom

Avg CPU Util

28.91 %
CPU utilization - Total

Avg IOPS

52.71k IO/s
IOPS - Total

Avg latency

8.10 ms
Latency - Total

Ec2 instance type by Region

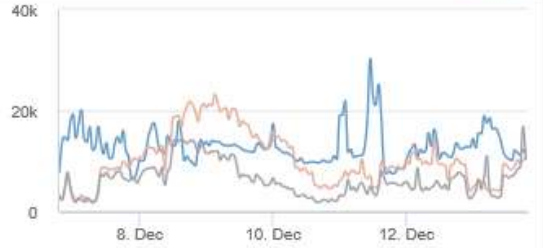
Hypervisor name	Capacity - Total (GB)	IOPS - Total (IO/s)	Latency - Total (ms)
us-west-2c(1)	1,209.00	N/A	N/A
us-east-1c(325)	431,547.00	103.91	10.97
us-east-1d(310)	239,707.00	85.86	5.02
us-east-1a(289)	282,932.00	45.66	7.41

925 items found in 4 groups

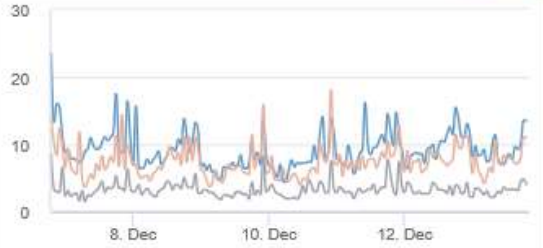
US - East IOpS Trend

US - East Latency (ms)

Top 5 HyperVisors by IOpS



Top 5 HyperVisors by Latency (ms)



CPU Utilization %

Click on the screen shot above to return to the report description.

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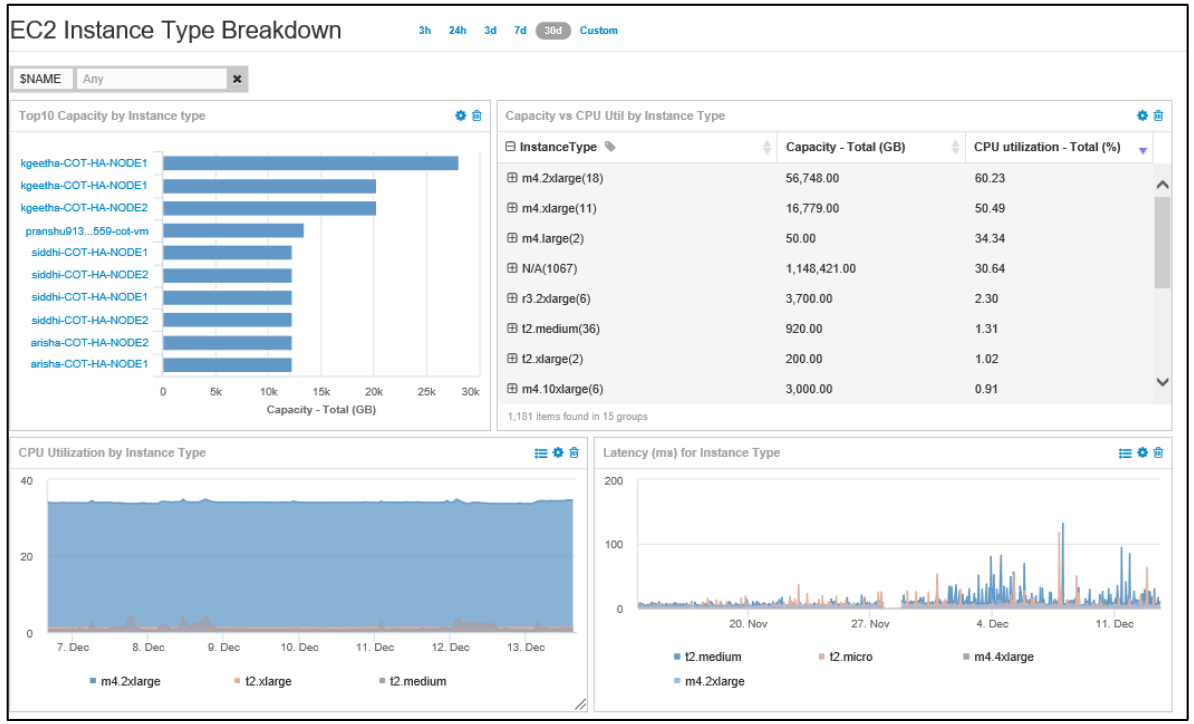
7.18 WebUI – EC2 Instance Type Breakdown

Description: This WebUI based dashboard shows EC2 Instance Types broken down by Capacity and Performance. At the top left, a filter box is available to located individual instance types. A top 10 Instance capacity chart with an adjacent Instance Type inventory list is visible. CPU Utilization and Latency trends are shown by Instance Type at bottom.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.1 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
$NAME	Input variable used to filer the dashboard for a specific Instance Types.
Instance Type	The As-Configured virtual machine hosted by AWS and based on provisioned CPU, RAM memory and storage. (e.g. t2.small, t2.medium, t2.large, etc.).
Date	The date field applied to trending charts and selectable by the user.
Capacity – Total (GB)	Amount of capacity provisioned to the AWS instance in GB.
CPU Utilization – Total (%)	Average CPU Utilization as reported by virtual machine instances for the user selected time period.
Latency (ms)	Average Latency in milliseconds as reported by virtual machine instances for the user selected time period.

Click on the report screen shot above to view an enlarged image.

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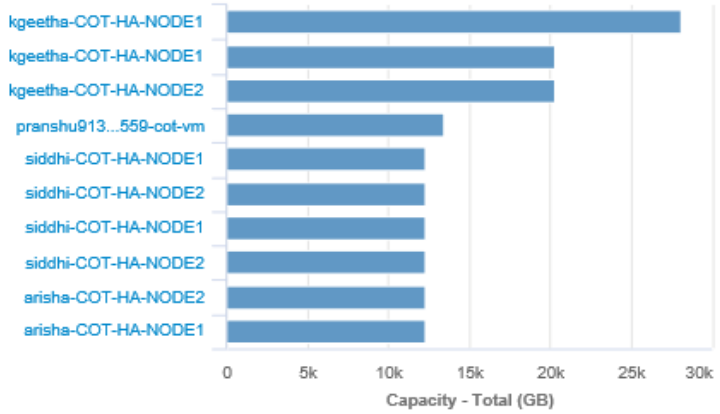
EC2 Instance Type Breakdown

3h 24h 3d 7d 30d Custom

$NAME Any

Top10 Capacity by Instance type

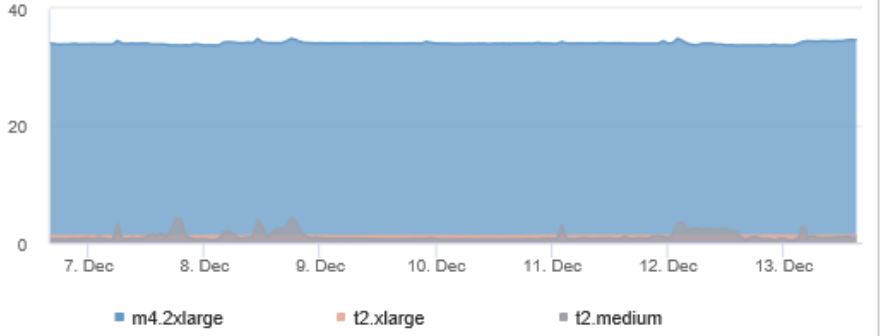


Capacity vs CPU Util by Instance Type

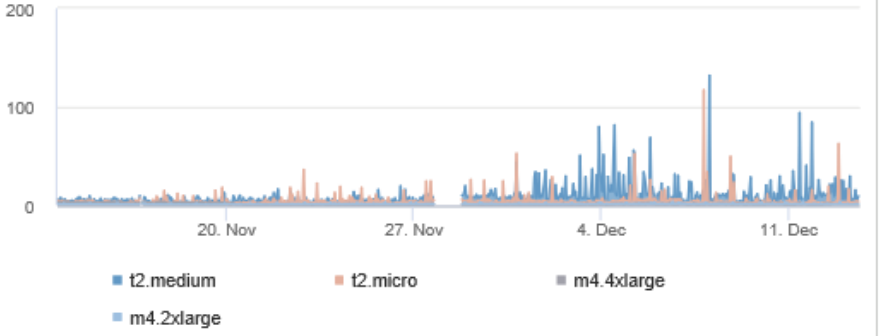
InstanceType	Capacity - Total (GB)	CPU utilization - Total (%)
m4.2xlarge(18)	56,748.00	60.23
m4.xlarge(11)	16,779.00	50.49
m4.large(2)	50.00	34.34
N/A(1067)	1,148,421.00	30.64
r3.2xlarge(6)	3,700.00	2.30
t2.medium(36)	920.00	1.31
t2.xlarge(2)	200.00	1.02
m4.10xlarge(6)	3,000.00	0.91

1,181 items found in 15 groups

CPU Utilization by Instance Type



Latency (ms) for Instance Type



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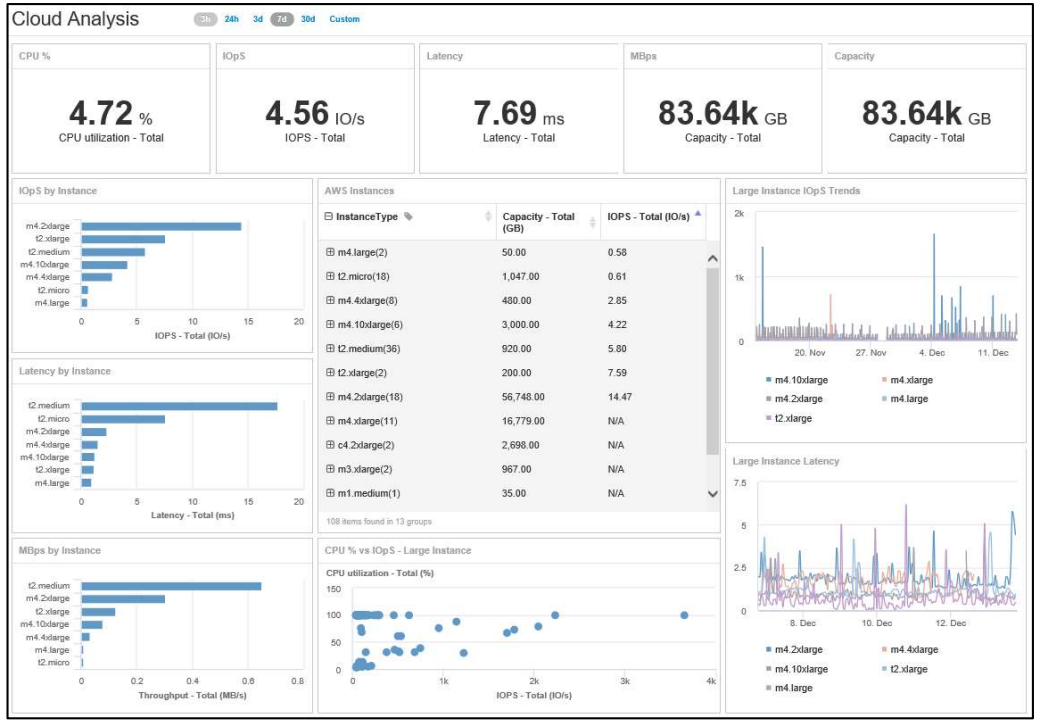
7.19 – WebUI – Cloud Analysis

Description: This WebUI based dashboard provides a basic analysis of the Cloud Environment. Performance and Capacity counters are summarized at the top of the page. Charts showing Instance Types by performance, Large Instance Trends and CPU vs IOpS comparisons are show at bottom.

Prerequisites: Requires access to the OCI WebUI. This is only available in OnCommand Insight versions 7.3.2 or later. Required licenses for OCI are Discover, Perform and Plan.



Data Dictionary

☐ **Select This Report**

Field	Description
Instance Type	The As-Configured virtual machine hosted by AWS and based on provisioned CPU, RAM memory and storage. (e.g. t2.small, t2.medium, t2.large, etc.)
Date	The date field applied to trending charts and selectable by the user.
CPU Utilization – Total (%)	Average CPU Utilization as reported by virtual machine instances for the user selected time period.
IOPS – Total (IO/s)	Average IOPS as reported by virtual machine instances for the user selected time period.
Latency – Total (ms)	Average Latency in milliseconds as reported by virtual machine instances for the user selected time period.
Throughput – Total (MB/s)	Average Throughput in MB/second as reported by virtual machine instances for the user selected time period.
Capacity – Total (GB)	Amount of capacity provisioned to the AWS instance in GB.

Click on the report screen shot above to view an enlarged image.

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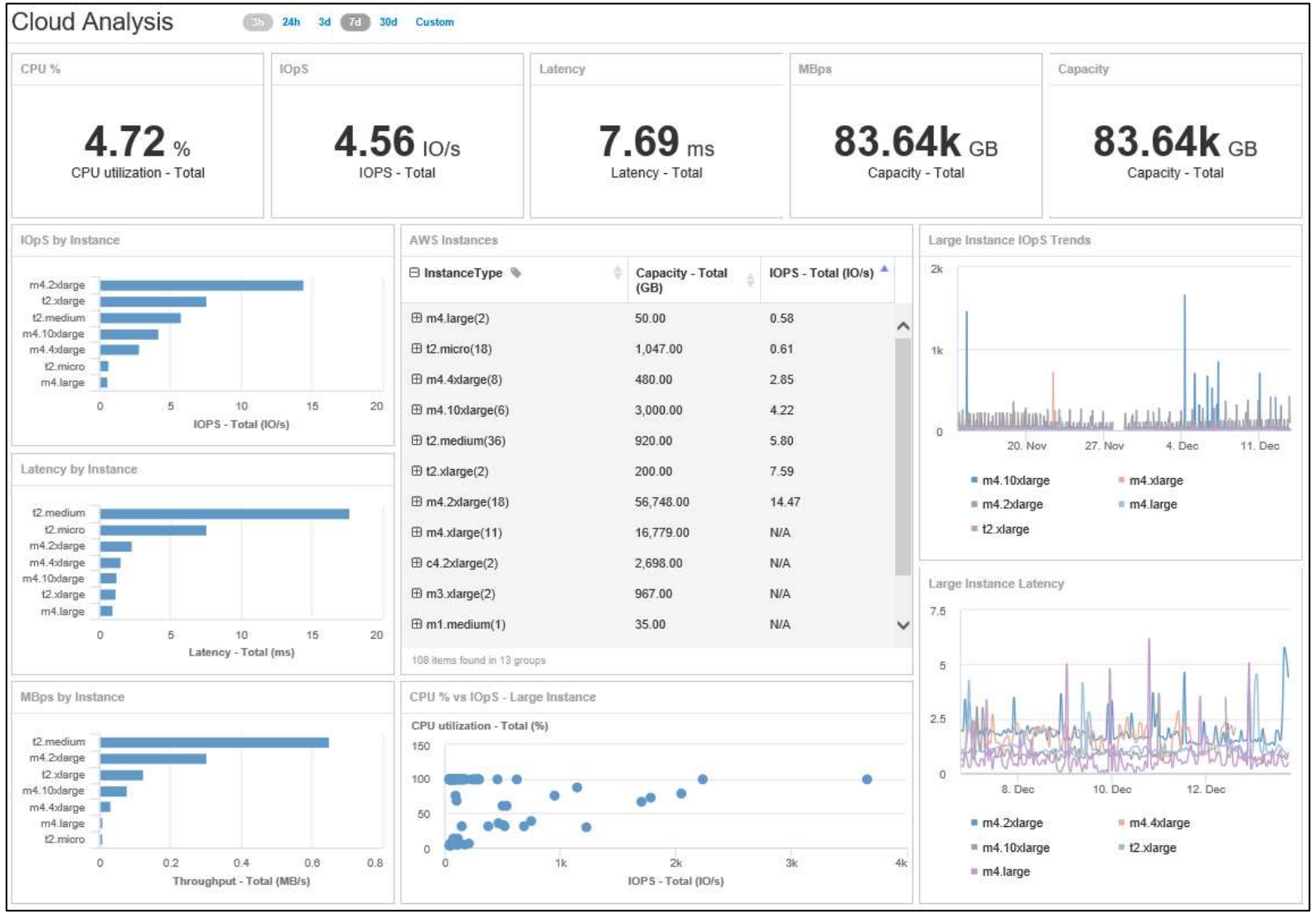

 Click on the screen shot above to return to the report description.

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- ☐ 2.3 On-Prem Storage – Executive Summary
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