



NetApp Synergy User Manual

Version 1.0

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Preface

NetApp® creates innovative storage and data management solutions that accelerate business breakthroughs and deliver outstanding cost efficiency. Discover our passion for helping companies around the world go further, faster at www.netapp.com.

This document describes how a user can deploy and install the NetApp Synergy product to perform

AUDIENCE

The primary audience for this document is intended to be Service Engineering personnel responsible for installing and deploying the NetApp Synergy product.

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INFORMATION ABOUT THIS DOCUMENT

All information about this document including version history, review and approval, typographical conventions, references, and a glossary of terms can be found in the final chapter of this document.

1 Synergy Framework

NetApp Synergy is an application framework that allows you to build accurate, detailed models of NetApp controllers while also providing the capability to rapidly size a solution and make changes to the design so you can see the results immediately.

NetApp Synergy consists of two applications:

- Storage Design Studio
- Synergy Plugins

Storage Design Studio (SDS) is an application that allows you to manage the physical and virtual storage in your controller (aggregates, LUNs, volumes, qtrees, flexvols, etc.) by creating models of:

- NetApp Storage Controllers
- Disk Shelves
- Aggregates
- Flexvols
- Qtrees
- LUNs

This application is extremely accurate in how space consumption of volumes and aggregates is calculated. You can use this tool to obtain precise sizing information of models to determine if your solution meets a specific customer platform and number of disks. There are two versions of SDS that can be used within Synergy:

- **SDS Lite** – provides the capability to size and model storage solutions for NetApp controllers. This version is designed to be used by NetApp SE for pre-sales.
- **SDS Advanced** – extends capabilities of SDS Lite to include integration with SnapVault, SnapVault snapshots, and OSSV. This version is designed to be used by NetApp PS for post-sales deployment. It requires a lot of information only available when deploying NetApp storage.

Synergy Plugins are a set of visualization and modeling tools that allow you to view and analyze your storage configurations in real-time and make changes as needed to meet capacity, space, and other data center requirements.

A typical NetApp storage deployment model consists of:

- Hardware configuration
- Sizing of all storage containers (aggregates, volumes, LUNs, etc.)
- Mapping of storage containers to hosts

Once you have built the model, Synergy enables you to create CLI scripts necessary to implement the model and facilitate rapid deployment of the design. This reduces implementation time from hours to minutes while virtually eliminating errors during the implementation.

2 Synergy and SDS Installation

To install NetApp Synergy and its plugins, you must first download and install the Synergy application. Follow these steps to install Synergy:

Step	Action
1.	Navigate to < http://synergy.netapp.com .
2.	Click Downloads . The Downloads screen is displayed.
3.	Select the green NetApp Synergy Download button.
4.	You are then prompted to save the .exe file on your system. Save the file to your desktop or other folder.
5.	Once the file is saved to the location you specified, double-click on the executable file. A main screen is displayed.
6.	Read the license agreement carefully. If you accept the terms of the license agreement, click on the I understand and agree to the terms of usage button to install Synergy.

After installing Synergy, you can install the Storage Design Studio by following these steps:

Step	Action
1.	Launch the Synergy application.
2.	From the Synergy Tools menu, select Options and then click on the Support tab.
3.	Select Storage Design Studio from the Plugin drop-down menu.
4.	In the Features window, choose ONLY SDS Lite
5.	Click Request License. A license key is sent within 48 hours to you.
6.	After you receive your license key, go to Options – Support (as described above), and select the License Keys tab.
7.	Add the license key for SDS Lite, and click Save All
8.	Verify you see Storage Design Studio in the Command Bar menu.

3 Synergy Storage Design Studio

NetApp Storage Design Studio (SDS) is a robust storage configuration tool consisting of a GUI that you can use to manage physical and virtual storage within a NetApp controller. The GUI consists of the following three components.

- Sidebar
- Workspace
- Status Bar

3.1 SideBar

Located on the left-side of the GUI, the sidebar consists of three tabs:

- **Project Library** – list of existing customers and projects, organized hierarchically.
- **Controllers** -
- **SAN** – section presenting information about storage controllers and SAN components like hosts, switching, and zoning.

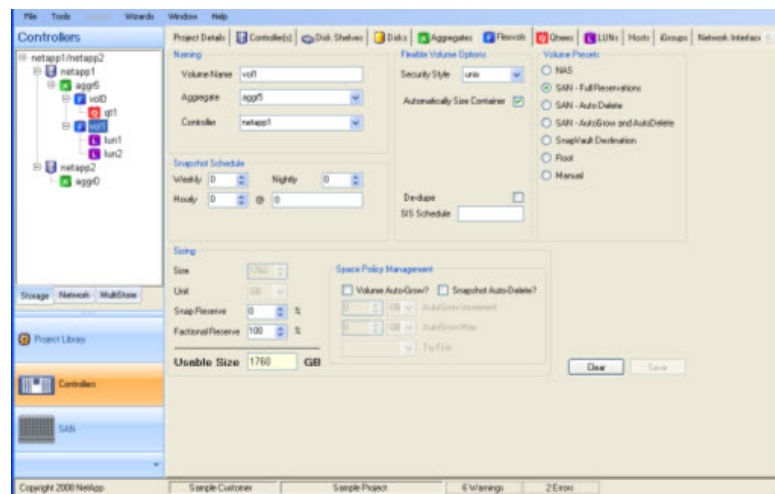


Figure 1 - Synergy SDS Graphical User Interface

3.2 Workspace

The workspace area is divided into multiple tabs, each representing different aspects of storage design. Some examples of tabs you see in the workspace are: aggregates, volumes, LUNs, Qtrees, Hosts and HBAs, and SnapMirror relationships. Each tab allows for the configuration of a single item in the design, and some tabs even have their own browser in the form.

Most workspace tabs consist of two buttons,

- **Add/Save** – a multi-mode button allowing you to create and then save new objects after entering a sufficient amount of information in the form about the object before saving it. If you have not entered enough information in the form to create an object or have made errors in the form, the **Add/Save** button is disabled (grayed-out). To correct any errors, simply move your mouse over the form and an error icon is displayed (see Figure 2).
- **Clear** – a button that resets the form and allows you to create a new object.

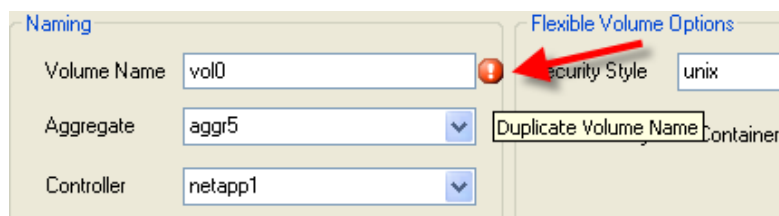


Figure 2 - Add/Save error displayed in form

3.3 Status Bar

The Status Bar is located at the bottom of the main screen and consists of several important fields:

- **Customer name** – name of the customer for the current project.
- **Project name** – name of the project.
- **Warnings** – number of warnings in the current project. Clicking on this box opens a browser that displays any warnings.
- **Errors** – number of errors in the current project. Clicking on this box opens a browser that displays any errors.
- **Status (normally hidden)** – displays status of long-running operations such as a Project Open operation.



Figure 3 - Status Bar

3.4 SideBar: Project Library

When you open Synergy for the first time, the first element in the tree structure you see is the Project Library. The Project Library lists customers and projects, organized and displayed hierarchically within the tree. Figure 4 shows a sample Project Library with two customers, each with their own project.

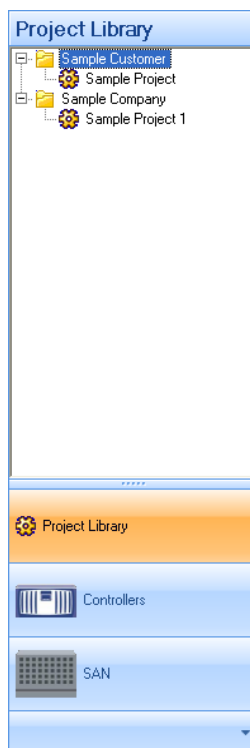


Figure 4 - Sample Project Library

3.4.1 Managing Existing Projects and snapshots

The Project Library is made up of customer folders and project files within each customer folder. Before performing any administrative tasks, you first need to open the project in order to view project details. To open a project, select the project you want to open and double-click the project name. Once opened, you can see the workspace tabs containing all of the project details.

Within a customer folder are saved projects where snapshots are archived. Each time you work in a project and save the project, a snapshot is taken of the project details so you can retrieve this information later. This is especially helpful when you want to view changes made to a project and see the date and time of these changes. By simply right-clicking on the project, a menu with **Open**, **Delete**, and **Recent** selections is displayed.

The snapshots of each project can be accessed by right-clicking on the project and selecting **Recent**.

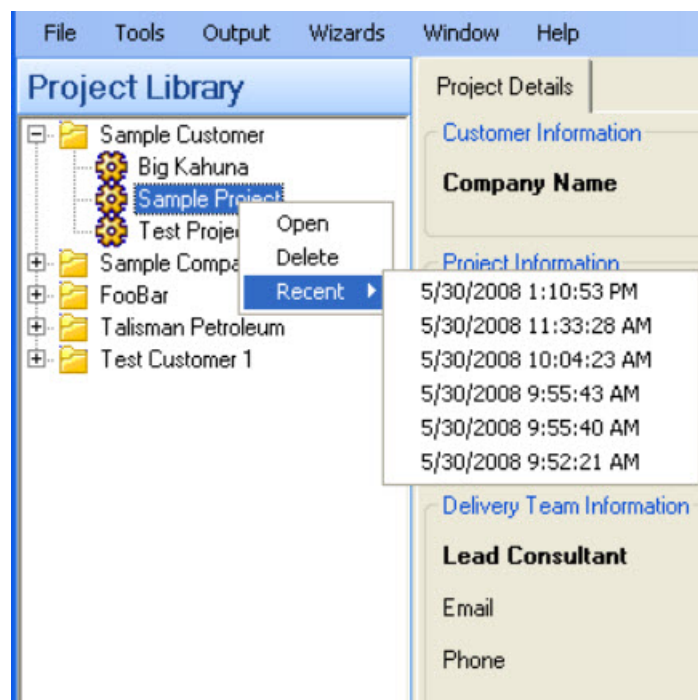


Figure 5 - Viewing Recent Project Snapshots

3.5 SideBar: Controllers

The Controllers SideBar displays three hierarchical views of the project. Those views are:

- Storage View
- Network View
- Multistore View

3.5.1 Storage View

The Storage View contains a view of all the storage containers in the project. Storage containers are considered any object that is created to store data, such as a volume or LUN. The hierarchy is defined in the following order:

- Cluster (if applicable)
- Controllers
- Aggregates
- Flexible Volumes
- Qtrees
- LUNs

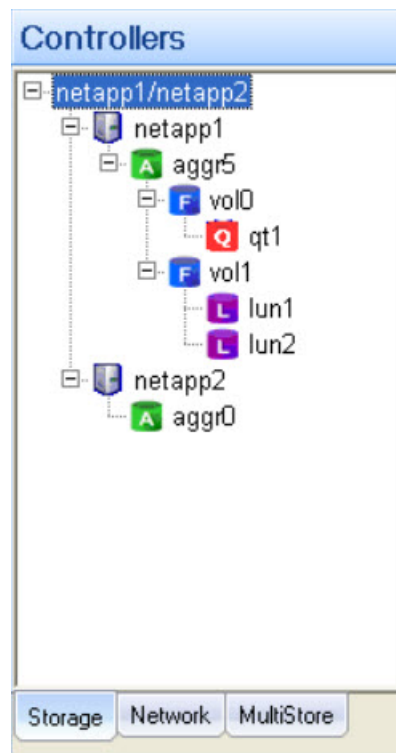


Figure 6 - Controllers View

3.5.2 Creating Storage Containers

The Storage View provides context menus to create appropriate sub-containers. For example, you can right-click on a volume, and the menu displayed presents options for creating a LUN or a Qtree in that volume. Once an “Add ...” menu item is selected, the appropriate workspace tab is selected and pre-populated with the parent container information. Using the previous example and selecting a LUN, the LUN tab is selected and populated with Controller and Volume fields pre-populated.

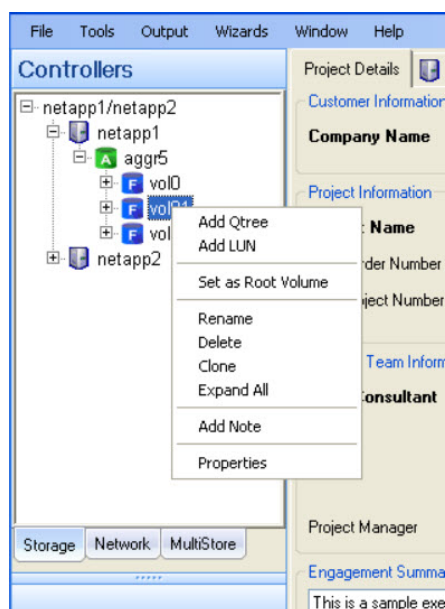


Figure 7 - Storage View

3.5.3 Drag and Drop Operations

The Storage View provides some drag-and-drop capabilities. This interface allows you to move certain storage containers to other locations. For example, you can drag a volume from one aggregate to another, even moving that volume between controllers in the same cluster. The sub-containers of the object being moved are moved with it. Valid drag and drop operations within the Storage View include:

- Flexvol to another aggregate within the same cluster.
- Qtree to another flexvol within the same cluster.
- LUN to another flexvol or qtree within the same cluster.

In some cases, you can drag and drop a storage container on to a workspace tab. This allows you to populate all fields in a form with information from the dropped object. For instance, dropping a flexvol from the Storage View on to the LUN tab populates the Controller (which the volume resides on) and the Volume name fields. Valid drag and drop operations to workspace tabs are:

- Flexvol or Qtree to LUN Volume or Qtree fields.
- Flexvol or Qtree to SnapMirror Source and Destination Volume and Qtree fields.

It is also possible for you to create Volume SnapMirror (VSM) relationships directly using drag and drop. Click on a volume in the Storage View and drag it to an aggregate; however, before releasing the mouse button, be sure to hold down the shift key. This then creates a new volume with the same size as the volume and creates a SnapMirror relationship between the original volume and the new volume. This new volume (destination) is initially named the same as the source volume, except that “_mirror” will be appended to the end of the original volume name.

3.6 Network View

The Network View contains a view of all network interfaces on a controller. The network interfaces listed can be physical network interfaces, virtual network interfaces (VIFs), and VLAN tagged interfaces. The hierarchy in this view is:

- Cluster (if applicable)
- Controller
- IPspace
- Network Interface

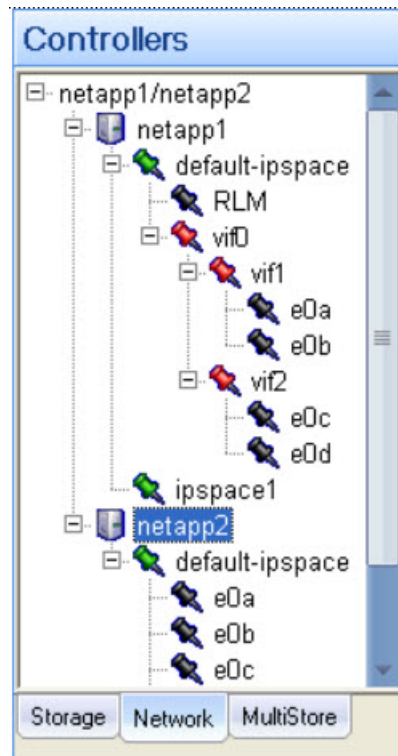


Figure 8 - Network View

3.6.1 Network Interface Configuration

Network interfaces are configured by double-clicking on the Interface tab in the Network View. This populates the fields in the Network Interfaces workspace tab with information about the network interface, such as IP Address, Netmask, and Partner address.

3.6.2 Network Interface Creation

Physical network interfaces are created automatically at the time the controller and Ethernet PCI cards are configured.

Virtual network interfaces are created by right-clicking on the controller, which then take you to the context menu. The context menu contains a menu item called **Add VIF**, which when selected, opens an **Add VIF** dialog box where information about the virtual network interface can be entered.

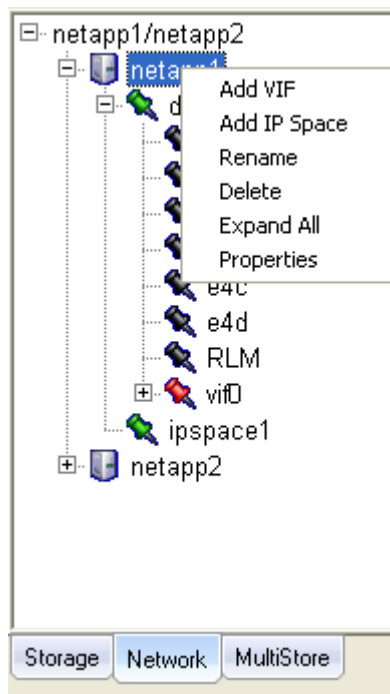


Figure 9 - Adding a Virtual Interface

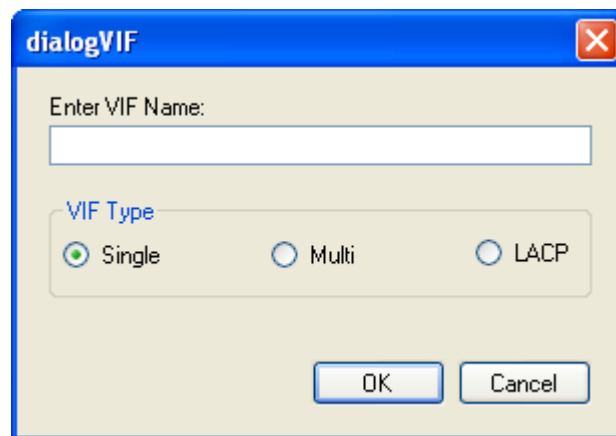


Figure 10 - Virtual Interface Dialog

VLAN-tagged interfaces are created in a similar fashion. Right-clicking on the physical interface brings up the context menu. Select Add VLAN Tagged Interface. You are then prompted for the VLAN ID. Once you click the OK button, a new interface in the Network View with the name of the original interface and the VLAN ID is created.

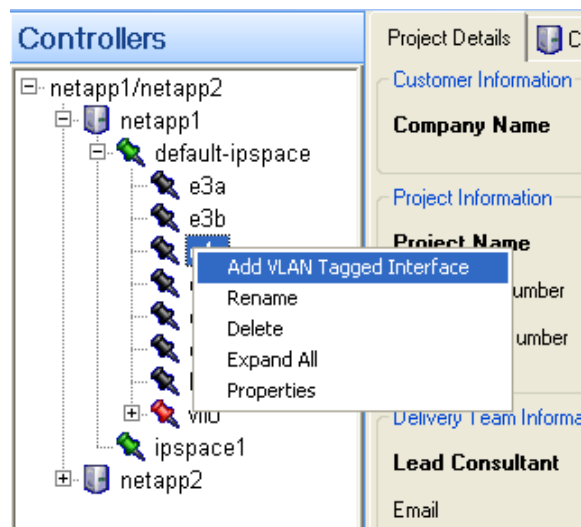


Figure 11 - Add VLAN Tagged Interface

3.6.3 Drag and Drop Operations

The Network View also provides drag-and-drop capabilities. This interface allows you to move physical interfaces into VIFs; however, the sub-interfaces of the object being moved are moved with it. Valid drag and drop operations within the Storage View include:

- Physical interface to VIF on the same controller.
- VIF to another VIF on the same controller.
- Physical Interface or VIF to another IPSpace on the same controller.

3.7 MultiStore View

The MultiStore View contains a view of all virtual filers (vfilers) on a controller, as well as the IP Space each Vfiler is a member of. The volumes that are a member of each vfiler are also shown in this view. The heirarchy in this view is:

- Cluster (if applicable)
- Controller
- IPSpace
- Virtual Filer
- Volumes

Note: Synergy Storage Design Studio does not currently support Qtrees as a container type in a vfiler.

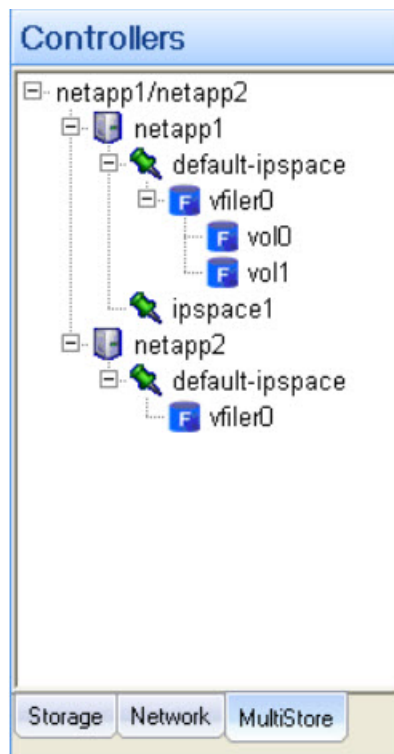


Figure 12 - MultiStore View

3.7.1 Drag and Drop Operations

The Multistore View provides some drag-and-drop capabilities. This interface allows you to move containers related to virtual filers into other containers. Valid drag and drop operations within the Storage View include:

- Virtual filer to another IP Space within the same controller
- Volumes from one virtual filer to another virtual filer in the same controller.

Note: All volumes are initially placed in “vfiler0” for each controller.

3.8 SideBar: SAN

The SAN SideBar displays four hierarchical views of the project. Those views are:

- Hosts View
- Switches View
- Zoning View
- Target Ports View

3.8.1 Hosts View

The Hosts View contains a view of all hosts on the SAN. The hosts will contain the Host Bus Adapters (HBAs) for each host. The heirarchy in this view is:

- Host
- HBA

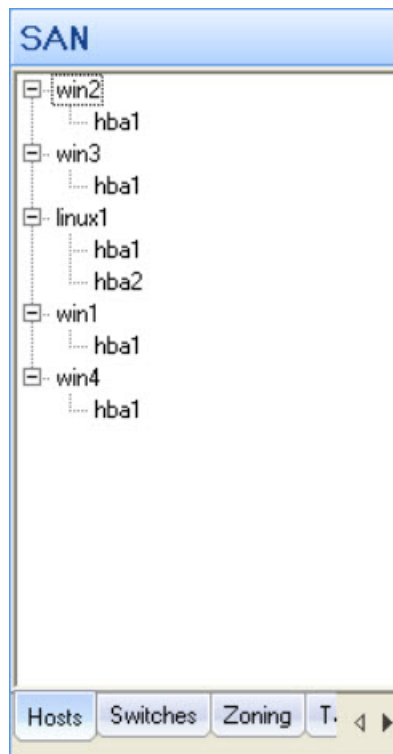


Figure 13 - SAN Hosts View

3.8.2 Host Creation Configuration

Hosts are configured by double-clicking on the host in the Hosts View, which then populates the fields in the hosts workspace tab.

To create a new host, right-click anywhere (not on another object) in the hosts view and the context menu allows you to add a new host. Clicking on **Add Host** selects the hosts tab and enables the Hosts portion of the form. In this mode, the HBAs section of the tab is disabled.

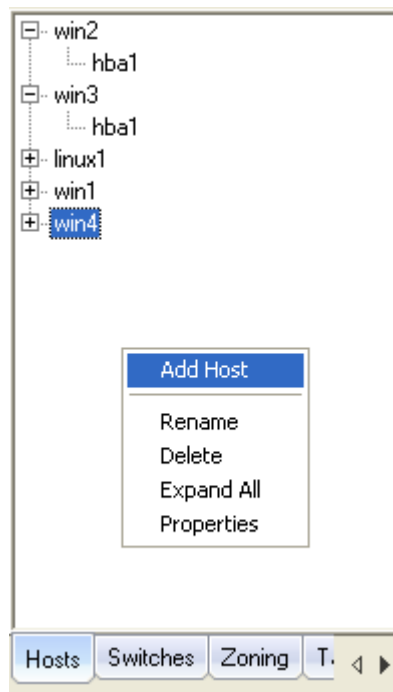


Figure 14 - Hosts View

3.8.3 HBA Creation and Configuration

HBAs are configured by double-clicking on an HBA in the Hosts View, which then populates the fields in the Hosts workspace tab.

To create a new HBA, right-click on a Host in the Hosts View. The context menu shows you how to add a new HBA. Clicking **Add HBA** selects the Hosts tab and enables the HBA portion of the form. In this mode, the Host section of the tab is disabled.

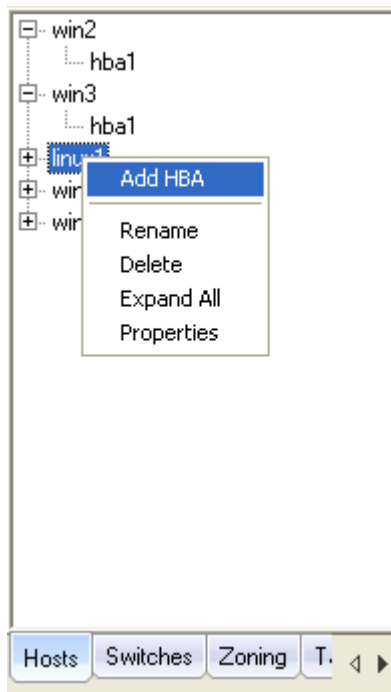


Figure 15 - Adding an HBA

3.8.4 Drag and Drop Operations

The Hosts View provides some drag-and-drop capabilities. This interface allows you to connect HBAs to other types of devices. Valid drag-and-drop operations within the Hosts View include:

- HBA to a Fibre Channel Switch Port. Drag an HBA from Hosts View to the Switch Explorer on the Switches Tab.
- HBA to a Zone. Drag an HBA from the Hosts View to the Zone Explorer View on the Zones Tab.
- HBA to an Initiator Group (iGroup). Drag an HBA from the Hosts View to the iGroup Explorer on the iGroups Tab.

3.9 Switches View

The Switches View contains a view of all Fibre Channel switches on the SAN. This view displays the switches, modules, ports and what is connected to port. The heirarchy in this view is:

- Switch
- Module (if applicable for modular and director class switches)
- FC Port (and connected HBA)

Note: The Switches View is exactly the same as the Switch Explorer on the FC Switches tab.

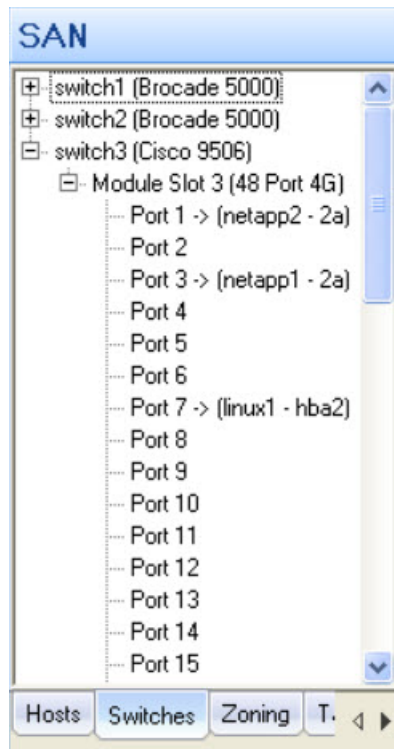


Figure 16 - Switches View

3.9.1 Switch Creation and Configuration

Switches are configured by double-clicking on a switch in the Switches View, which then populates the fields in the FC Switches workspace tab.

To create a new switch, right-click anywhere (except on another node) in the Switches View. The context menu gives you the option to Add Switch. Clicking on **Add Switch** selects the FC Switches tab and enables the Switch portion of the form. In this mode, the Switch Module section and the Port section of the tab are disabled.

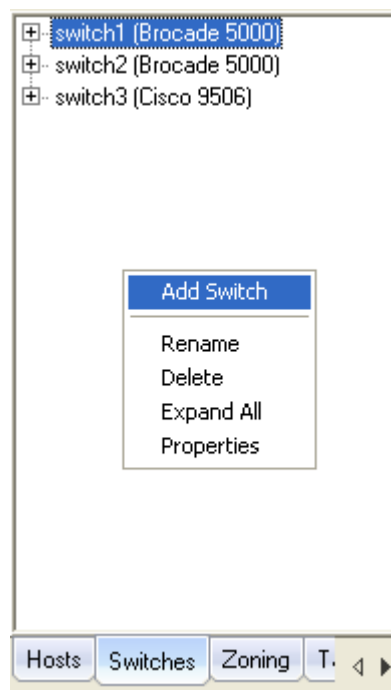


Figure 17 - Adding a Switch

3.9.2 Switch Module Creation and Configuration

Switch Modules are configured by double-clicking on a module in the Switches View, which then populates the fields in the FC Switches workspace tab.

To create a new switch, right click on a director class (or modular) switch in the Switches View. The context menu gives you the option to add a new switch module by selecting **Add Module**. Clicking on **Add Module** selects the FC Switches tab and enables the Switch Module portion of the form. In this mode, the Switch section and the Port section of the tab are disabled.

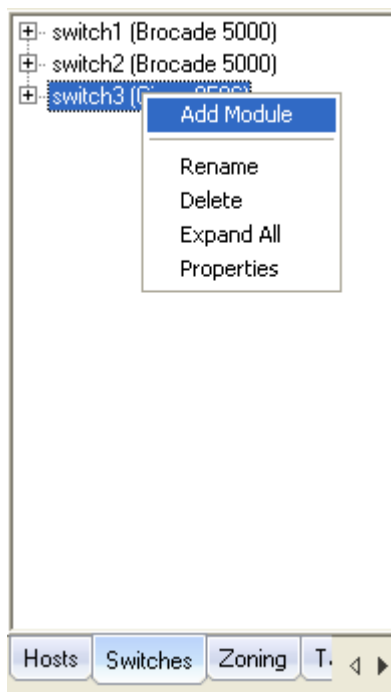


Figure 18 - Switch Module Creation

3.9.3 Switch Port Configuration

Switch Ports are automatically created at the time a switch or switch module is created. The number of ports created depends on the switch or module selected.

Note: Synergy Studio Design Studio does not differentiate between ports with and without SFPs.

Switch Ports are configured by double-clicking on a module in the Switches View, which populates the fields in the FC Switches workspace tab. The only switch port option you are allowed to select is configuration of the VSAN ID for the port (this only applies to Cisco switches).

3.9.4 Drag and Drop Operations

The Switches View does not provide drag-and-drop capabilities directly. Since the Switch Explorer on the FC Switches is the same view, you can drop HBAs from the Hosts View on to switch ports; however, if you drop an HBA that's already connected to another switch port, this has the effect of unplugging the port from the original port and connecting it to the new port.

3.10 Zoning View (SDS Advanced only)

The Zoning View contains a view of all Fibre Channel switches on the SAN and the zones that reside on them. This view displays the switches, zonesets (or configurations for Brocade), zones and zone members. The hierarchy in this view is:

- Switch
- Zoneset
- Zone
- Zone Members

Note: The Zoning View is exactly the same as the Zone Explorer on the Zoning tab.

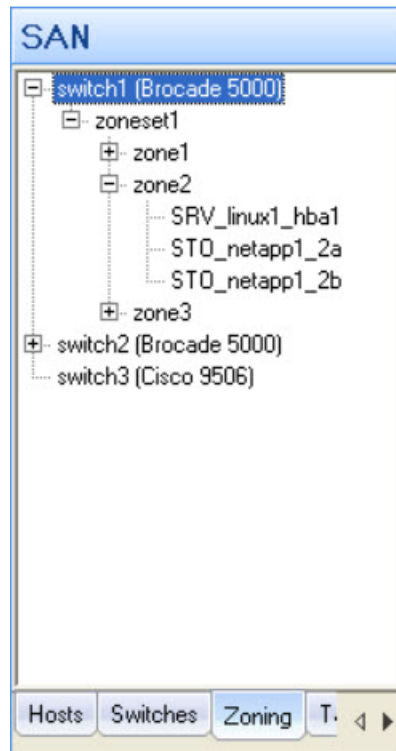


Figure 19 - Zoning View

3.10.1 ZoneSet Creation and Configuration

ZoneSets are configured by double-clicking on a switch in the Switches View, which populates the fields in the FC Switches workspace tab.

To create a new ZoneSet, right-click on a switch in the Zoning View. The context menu gives you the option to **Add Zoneset**. Clicking on **Add ZoneSet** selects the Zoning tab and enables the ZoneSet portion of the form. In this mode, the Zone section of the tab is disabled.

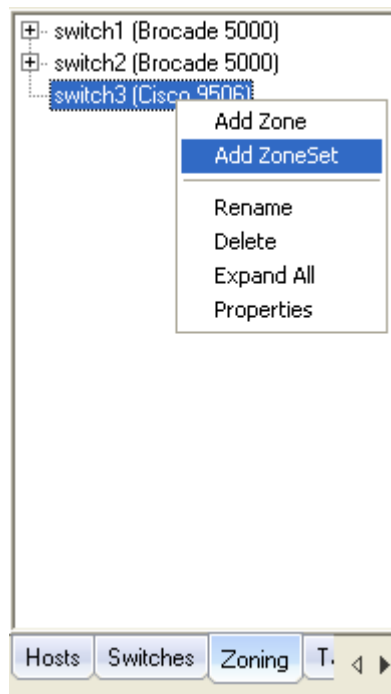


Figure 20 - Adding a ZoneSet

3.10.2 Zone Creation and Configuration

Zones are configured by double-clicking on a zone in the Zoning View, which populates the fields in the Zoning workspace tab.

To create a new zone, right-click on a switch or zoneset in the Zoning View. The context menu gives you the option to Add Zone. Clicking on Add Zone selects the Zoning tab and enables the Zone portion of the form. In this mode, the ZoneSet section of the tab is disabled.

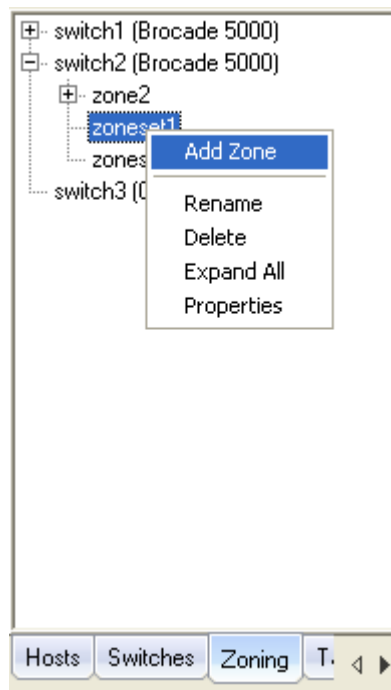


Figure 21 - Adding a Zone

3.10.3 Drag and Drop Operations

The Zoning View does not provide drag-and-drop capabilities directly. Since the Zone Explorer on the Zoning tab is the same view, it is possible to drop HBAs from the Hosts View on to zones.

3.11 Target Ports View

The Target Ports View contains a view of all Fibre Channel target ports on a NetApp controller. This view exists so you can connect target ports to FC switches and configure them in zones. The hierarchy in this view is:

- Cluster (if applicable)
- Controller
- Target ports

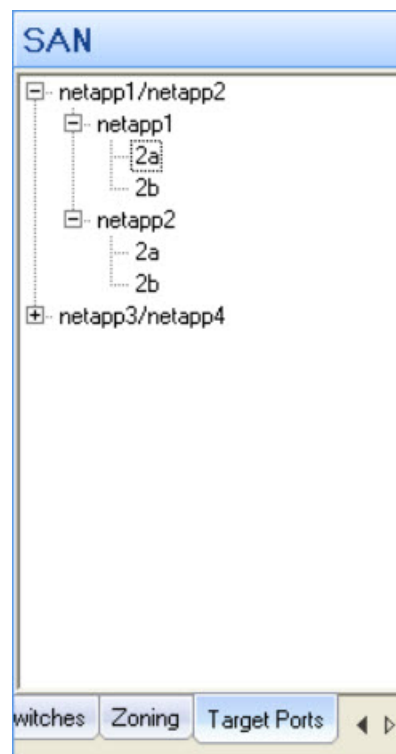


Figure 22 - Target Ports View

Figure 17. Target Ports View

3.11.1 Target Port Creation and Configuration

Target Ports are automatically configured at the time a controller is created or configured. For more information on configuring target ports, refer to Section 4.2. Worldwide Port Numbers (WWPNs) for target ports can be configured on the Controller Ports tab. Refer to section 4.3 for more information on configuring WWPNs.

3.11.2 Drag and Drop Operations

The Target Ports View provides some drag-and-drop capabilities. This interface allows you to connect target ports to switch ports and add target ports to a zone. Valid drag and drop operations within the Target Ports View include:

- Target port onto a FC Switch Port in the Switch Explorer on the FC Switches tab.
- Target port onto a Zone in the Zone Explorer on the Zoning tab.

4 WORKSPACE

This workspace tab provides a place where you enter information about your project before beginning a new project. At a minimum, the following information must be entered:

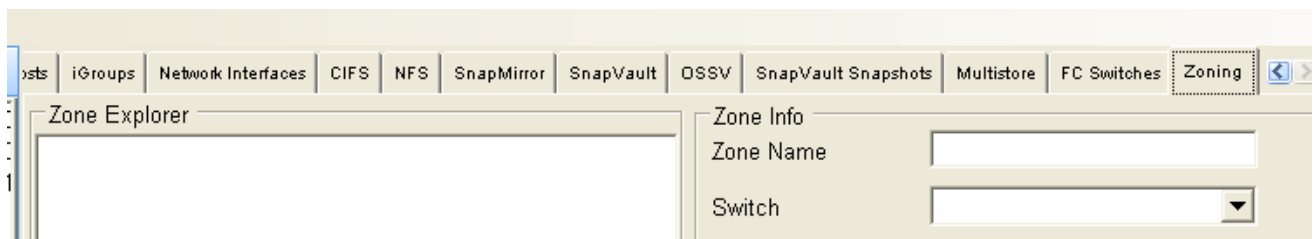
- Company name
- Project name
- Your name

Based on the version of SDS being used, the workspace tabs displayed are different.



The screenshot shows the 'Project Details' tab selected in the workspace. The interface includes a top navigation bar with tabs: Project Details, Controller(s), Disk Shelves, Disks, Aggregates, Flexvols, Qtrees, LUNs, Hosts, and FC Switches. Below the navigation bar, there are two main sections: 'Customer Information' and 'Project Information'. The 'Customer Information' section contains a 'Company Name' dropdown menu with 'Juniper' selected and an 'Add New Company' button. The 'Project Information' section contains a 'Project Name' text field with 'Exchange 2007' entered.

Figure 23 - Workspace Tabs for SDS Lite



The screenshot shows the 'Zoning' tab selected in the workspace. The interface includes a top navigation bar with tabs: Hosts, iGroups, Network Interfaces, CIFS, NFS, SnapMirror, SnapVault, OSSV, SnapVault Snapshots, Multistore, FC Switches, and Zoning. Below the navigation bar, there are two main sections: 'Zone Explorer' and 'Zone Info'. The 'Zone Explorer' section is empty. The 'Zone Info' section contains a 'Zone Name' text field and a 'Switch' dropdown menu.

Figure 24 - Workspace Tabs for SDS Advanced

4.1 Project Details

When Synergy is first launched, this is the only tab visible in the workspace area. If you are creating a project for a customer that does not already exist in the Project Library, you must select the **Add New Company** button to create the new customer. Once entered, click the **Save** button at the bottom of the form.

Project Details | Controller(s) | Disk Shelves | Disks | Aggregates | Flexvols | Qtrees | LUNs | Hosts | iGroups | Network Interface

Customer Information

Company Name Sample Customer

Project Information

Project Name Sample Project

Sales Order Number

PSA Project Number

Delivery Team Information

Lead Consultant Aaron Sims ☐ Populate Local User Info

Email aaron.sims@netapp.com

Phone 678.778.6827

Project Manager

Engagement Summary

This is a sample executive summary.

Figure 25 - Project Details Workspace Tab

4.1.1 Customer Information Section

Fields	Description
Company Name	Choose an existing customer. If customer does not yet exist, create the new customer by clicking on the Add New Company button.
Add New Company	Opens a form to create a new company. This Company name is visible in the Project Library sidebar.

4.1.2 Project Information Section

Fields	Description
Project Name	Name for your project. This will name is displayed in the Project Library under your chosen customer name.
Sales Order Number	NetApp Sales Order number.
PSA Project Number	PSA Project Number (only for NetApp internal and CDP)

4.1.3 Delivery Team Information Section

Fields	Description
Lead Consultant	Select an existing customer. If the customer does not yet exist, create a new customer by clicking on the Add New Company button and fill out the customer information in the form to create a new company.
Email	Name for your project. This name is displayed in the Project Library under your chosen customer name.
Phone	NetApp Sales Order number.
Project Manager	PSA Project Number (only for NetApp internal and CDP)

4.2 Controller(s)

This workspace tab allows you to create a controller (or clustered pair of controllers).

The screenshot displays the 'Controller(s)' workspace tab. The top navigation bar includes tabs for Project Details, Controller(s), Disk Shelves, Disks, Aggregates, Flexvols, Qtrees, LUNs, Hosts, iGroups, and Network Interface. The 'Controller(s)' tab is active.

System Details:

- Controller Model: FAS3070
- ONTAP Version: 7.2.4
- Clustered?: ☒
- Software Disk Ownership: ☒
- Primary Hostname: netapp1, Cabinet: 1, Slot: 18
- Partner Hostname: netapp2, Cabinet: 1, Slot: 21
- CF Mode:
- RLM Installed: ☐

Licenses:

- ☐ NFS, ☐ FCP
- ☐ CIFS, ☐ iSCSI
- ☐ SnapMirror, ☐ SnapRestore
- ☐ SnapVault Primary, ☐ SnapVault Secondary
- ☐ SnapLock Enterprise, ☐ Snaplock Compliance
- ☐ SyncMirror, ☐ MultiStore

Onboard FC Ports:

- 0a: Initiator (selected), Target
- 0b: Initiator (selected), Target
- 0c: Initiator (selected), Target
- 0d: Initiator (selected), Target

PCI Cards:

- Slot 1 Card: FC Initiator (Dual Port)
- Slot 2 Card:
- Slot 3 Card: Ethernet (Dual Port)
- Slot 4 Card:
- Slot 5 Card:
- Slot 6 Card:
- Slot 7 Card:
- Slot 8 Card:
- Slot 9 Card:

Buttons: Clear, Save

Figure 26 - Controller(s) Workspace Tab

4.2.1 System Details Section

Fields	Description
Controller Model	Pick the model of NetApp storage system. Older platforms (End of Availability) are selectable if the Show EOA platforms option is checked (in <i>Tools>Options>Options</i> menu).
ONTAP Version	Enter the Data ONTAP version for this storage system (must be 7.x. or higher).
Clustered?	If checked, this enables you to input a partner hostname.
Software Disk Ownership	This should automatically be checked for platforms that require software disk ownership.
Primary Hostname	Enter the hostname of the first controller.
Partner Hostname	Enter the hostname of the second controller (if clustered)
Cabinet	The cabinet in which this controller is located. This is required to produce the front view Visio diagram.
Slot	The cabinet slot in which this controller is located. This is required to produce the front view Visio diagram.
CF Mode	Select the CF mode for this storage system. This applies to both controllers in the cluster.
RLM Installed	Select if the RLM card is installed in this storage system. This applies to both controllers in the cluster.
FAS2000 Disk Model	If a FAS2000 series controller is chosen, this is visible and allows you to select the internal disk model.
FAS2000 Disk Quantity	If a FAS2000 series controller is chosen, this is visible and allows you to select the quantity of internal disks. This is automatically populated based on the maximum number of disks allowed by the platform.

4.2.2 Onboard FC Ports Section

Fields	Description
Target	Select this option for each onboard FC port that should be configured as a target FC port. If any onboard FC ports are configured as target ports, Synergy does not allow any target FC PCI cards to be configured.
Initiator	Select this option for each onboard FC port that should be configured as an initiator FC port. This is the default.

4.2.3 PCI Cards Section

Fields	Description
Slot 1 – 9 Cards	Drop-down box that allows you to select the specific PCI card you want to use. The number of slot cards is dependent on the number of PCI card slots you have available.

4.3 Controller Ports

This workspace tab allows the user to input the Worldwide Port Number (WWPN) addresses of each FC port configured in this controller/cluster. Choose the controller or cluster from the pull down box, which populates the FC ports list with the FC ports configured for that storage system.

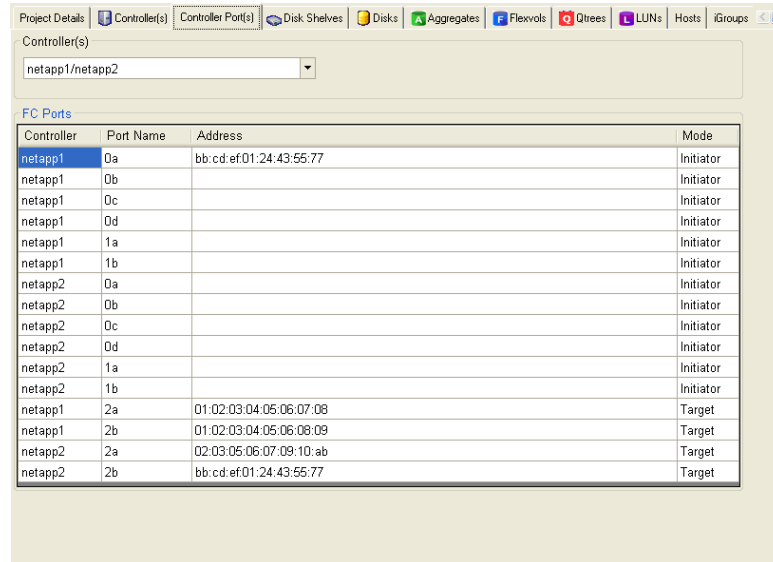


Figure 27 - Controller Port(s) Tab

4.3.1 Controllers Section

Fields	Description
Controllers	Choose the controller or cluster to filter the FC ports list.

4.3.2 FC Ports Section

Fields	Description
Controller	Displays the controller in the list view (Read only).
Port Name	Displays the port name (Read only).
Address	Enter the WWPN address of the port here.
Mode	Displays the mode of the port (Target or Initiator) (Read only)

4.4 Disk Shelves

This workspace tab allows you to add and configure DS14 disk shelves. Disk shelves are added one loop at a time. The Module A box controls the display of each loop of disks, whereas the Module B box allows you to configure the port on the other controller the loop is connected to. Depending on the version of SDS you are using, Advanced or Lite, the selections you can make and information you are required to enter in this tab are different. Figures 26 and 27 show both views of the disk shelves tab.

The cabinet location information is needed to draw the front view Visio diagram. The disk loops list view shows the list of all disk shelves. Clicking on a row in this list populates the whole loop.

Note: The multipath option is disabled in this version. Synergy Storage Design Studio is not yet capable of handling a Multipath HA configuration.

Project Details | Controller(s) | Disk Shelves (v2) | **Disk Shelves** | Disks | Aggregates | Flexvols | Qtrees | LUNs | Hosts | FC Switches

Controller(s): ftr-em01a-hq/ftr-em01b-hq **Total RAW Space:** 41.016 TB

Disk Loop - (Adding to ftr-em01a-hq/ftr-em01b-hq)

Shelves: 0 Disk Type: 144FC10K Add Shelves

Controller(s)	Disk Model	Total Shelves	Total Disks
ftr-em01a-hq/ftr-em01b-hq	300FC15K	10	140
ftr-em02a-hq/ftr-em02b-hq	300FC15K	9	126
ftr-ev01-hq/ftr-ev02-hq	1000ATA	1	14
wvf-exfiler1/wvf-exfiler2	300FC15K	8	112

Delete Shelves

Figure 28 - Disk Shelves Tab (Lite)

Project Details | Controller(s) | Controller Port(s) | Disk Shelves (v2) | **Disk Shelves** | Disks | Aggregates | Flexvols | Qtrees | LUNs | Hosts

ESH Module A

Controller: ftr-em01a-hq

In Port: 0a

Out Port:

Disk Type: ☒ FC ☐ ATA

Shelf: Mk2 Mk4

Auto Cabinet Location: ☐ Top Half ☐ Bottom Half ☒ Off

Cab: + -

ESH Module B

Controller: netapp2

In Port:

Out Port:

Disk Loop

Shelf ID	Disk Type	Disk Count	Cabinet	Slot	Shelf Type	Clear
1	300FC15K	14	1	24	Mk4	X
2	300FC15K	14	1	27	Mk4	X
3	300FC15K	14	1	30	Mk4	X
4	300FC15K	14	1	15	Mk4	X
5	300FC15K	14	1	12	Mk4	X
6		14	1	0		X

Clear DiskTypes Save Loop

Disk Shelves

Module A	Module B	Disks	Disk Model	Shelf Type	Cabinet	CabinetSlot
ftr-em01a-hq-0a	ftr-em01b-hq-0a	14	300FC15K	DS14 mk4 FC	1	24
ftr-em01a-hq-0a	ftr-em01b-hq-0a	14	300FC15K	DS14 mk4 FC	1	27
ftr-em01a-hq-0a	ftr-em01b-hq-0a	14	300FC15K	DS14 mk4 FC	1	30
ftr-em01a-hq-0a	ftr-em01b-hq-0a	14	300FC15K	DS14 mk4 FC	1	15

Delete Shelf

Figure 29 - Disk Shelves Tab (Advanced)

4.4.1 Module A Section

Fields	Description
Controller	Choose the controller that the "A" module of the disk shelf connects to.
In Port	Choose the FC port on the chosen controller that the "A" module of the disk shelf connects to. This pull down menu only shows initiator mode ports.
Out Port	Multipath HA is not currently supported.

4.4.2 Disk Type Section

Fields	Description
FC	Selecting this option limits all disk selections to FC type disks for this loop.
ATA	Selecting this option limits all disk selections to ATA type disks for this loop.

4.4.3 Shelf Types Section

Fields	Description
Mk2	This shortcut button sets all shelves in this loop to Mk2 DS14 shelves. This can be overridden on a per-shelf basis later.
Mk4	This shortcut button sets all shelves in this loop to Mk4 DS14 shelves. This can be overridden on a per-shelf basis later.

4.4.4 Auto Cabinet Location Section

Fields	Description
Top Half	This shortcut automatically sets the cabinet slot position for all disk shelves in the loop to populate the upper half of a cabinet. This can be changed on a per-shelf basis later.
Bottom Half	This shortcut automatically sets the cabinet slot position for all disk shelves in the loop to populate the lower half of a cabinet. This can be changed on a per-shelf basis later.
Cabinet +	This shortcut automatically increments the cabinet number for all disks shelves in the loop by 1.
Cabinet -	This shortcut automatically decrements the cabinet number for all disks shelves in the loop by 1.

4.4.5 Module B Section

Fields	Description
Lead Consultant	This is populated with the cluster partner of the controller chosen in the Module A section (Read only).
In Port	Choose the port on this controller where the "B" Module of this disk loop connects.
Out Port	Multipath HA not currently supported in this version.

4.4.6 Disk Loop Section

Fields	Description
Disk Type	Choose the disk model that populates this disk shelf. Mixing of disk drive sizes within a shelf is not allowed.
Disk Count	Enter the number of disks populating this shelf.
Cabinet	Enter which cabinet this shelf resides in. Refer to Appendix X for more information on Cabinet Addressing system.
Slot	Enter the cabinet slot this shelf resides in. Refer to Appendix X for more information on Cabinet Addressing system.
Shelf Type	Choose the type of disk shelf (AT, Mk2, Mk4).
Clear	This button clears the corresponding disk shelf selection.
Add Loop	This button adds/saves all disk shelves configured in this loop.
Clear Disk Types	This button clears all entries in the Disk Loop box.

4.4.7 Disk Loops Section

Fields	Description
Delete Shelf	This button allows the deletion of individual disk shelves.

4.5 Disks

This workspace tab allows you to allocate disks to each controller in the cluster. This is primarily used for systems that use software disk ownership.

Once you have created disk shelves (on the **Disk Shelves** tab), all disk models that are configured in the controller are displayed in the **Unassigned Disks** box. This box displays how many disks are not assigned to either controller.

To assign disks to a controller, click on the row of the desired disk model in the **Unassigned Disks** list. Enter the number of disks to be assigned to the controller in the numeric input box for that controller. Click on the green arrow box to assign those disks to that controller.

To assign disks already assigned to one controller to the partner, bring the disk to an unassigned state before assigning to the other controller. Follow the same process as assigning a disk to unassigning a disk. Click on the desired disk model in the controller box, enter the number of disks to unassign and click the green arrow (which now points toward the **Unassigned Disks** box).

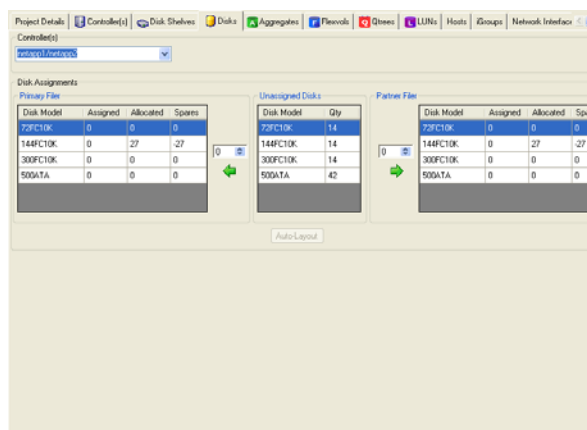


Figure 30 - Disks Tab

4.5.1 Controllers Section

Fields	Description
Controller(s)	Choose the storage system/cluster to perform disk assignments to.

4.5.2 Primary/Partner Controller Section

Fields	Description
Disk Model	Displays the disk model.
Assigned	Displays the number of disks assigned to this controller.
Allocated	Displays the number of disks allocated to storage objects (i.e. aggregates).
Spares	Displays the number of spares for this disk model. This is calculated as Assigned Disks – Allocated Disks.

4.6 Aggregates

This workspace tab allows you to create and configure aggregates.

The screenshot displays the 'Aggregates' tab in a NetApp management interface. At the top, a navigation bar includes tabs for Project Details, Controller(s), Disk Shelves, Disks, Aggregates (selected), Flexvols, Qtrees, LUNs, Hosts, iGroups, and Network Interface. The main configuration area is divided into several sections:

- Naming:** Contains 'Aggregate Name' (text input with 'aggr5') and 'Controller' (dropdown menu with 'netapp1').
- Aggregate Options:** Includes 'Snap Reserve %' (spinner set to 0), 'RAID Type' (dropdown set to RAID-DP), 'Advanced RG Layout' (checkbox), 'SnapLock' (radio buttons for None, Enterprise, Compliance, with 'None' selected), and 'SyncMirror' (radio buttons for No, Yes, with 'No' selected).
- Sizing:** Includes 'Disk Size' (dropdown set to 144FC10K), 'Disks' (spinner set to 27), and 'RAID Group Size' (spinner set to 16).
- Summary:** Shows 'Consumed Space' as 1783 GB (0 TB) and 'Usable Size' as 2749 GB (2.684 TB).
- Progress Bar:** A green bar indicates 65% completion.
- Buttons:** 'Clear' and 'Save' buttons are at the bottom.

Figure 31 - Aggregates Tab

4.6.1 Naming Section

Fields	Description
Aggregate Name	Enter/edit the name of the aggregate.
Controller	Select the controller this aggregate resides on.

4.6.2 Aggregate Options Section

Fields	Description
Snap Reserve %	Configures the Snap Reserve percentage for the aggregate.
RAID Type	Determines the RAID-Type for the aggregate. Defaults to RAID-DP. RAID0 is shown as an option, but only for V-Series controllers.
Advanced RG Layout	This checkbox enables the advanced configuration of each RAID Group, allowing multiple disk models in the same aggregate. Each RAID Group must have the same disk model.
SnapLock	Determines which type of SnapLock this configured aggregate is. Defaults to none.

4.6.3 Sizing Section

Fields	Description
Disk Size	Choose the disk model for this aggregate.
Disks	Enter the number of disks for this aggregate.
RAID Group Size	Enter the number of disks per RAID group.
SyncMirror	Choose to enable SyncMirror.

4.7 Flexvols

This workspace tab allows you to create and configure flexible volumes (or flexvols), including sizing, snapshot schedules, and space management settings.

This tab also contains several volume configuration presets. These presets are shortcuts that automatically set various flexvol options to meet with best practices for a desired configuration.

The screenshot displays the 'Flexvols' configuration window. At the top, there's a navigation bar with tabs: Project Details, Controller(s), Disk Shelves, Disks, Aggregates, Flexvols (selected), Qtree, LUNs, Hosts, Groups, Network Interface. The main area is divided into several sections:
1. **Naming**: Volume Name (vol0), Aggregate (agg0), Controller (netapp0).
2. **Snapshot Schedule**: Weekly (0), Nightly (0), Hourly (0), GB (0).
3. **Sizing**: Size (23), Unit (GB), Snap Reserve (20 %), Fractional Reserve (100 %), Usable Size (18.4 GB).
4. **Space Policy Management**: Volume Auto Grow? (checkbox), Snapshot Auto-Delete? (checkbox), AutoGrow Increment (GB), AutoGrow Max (GB), Top First (checkbox).
5. **Volume Presets**: Radio buttons for NAS, SAN - Full Reservations, SAN - Auto Delete, SAN - AutoGrow and AutoDelete, SnapVault Destination, Root, and Manual (selected).
6. **Flexible Volume Options**: Security Style (lune), Automatically Size Container (checkbox), Dedupe (checkbox), SRS Schedule (text field).
At the bottom right, there are 'Clear' and 'Save' buttons.

Figure 32 - Flexvols Tab

4.7.1 Naming Section

Fields	Description
Volume Name	Enter/edit the name of the flexvol.
Aggregate	Select the aggregate where you want this flexvol to reside.
Controller	Select the controller where you want this flexvol to reside.

4.7.2 Flexible Volume Options Section

Fields	Description
Security Style	Choose the type of security style this volume should be configured with. Mixed mode is left off the list intentionally since using it is considered a very poor practice.
Automatically Size Container	If this option is chosen, the size input is disabled. The size of the volume is calculated to fit the size of all containers (qtrees with quotas and LUNs). Volume size is calculated assuming volume space guarantee.
De-dupe	This sets the volume to use de-duplication.
SIS Schedule	This is the SIS schedule for the volume.

4.7.3 Volume Presets Section

Fields	Description
NAS	This preset automatically sets the volume options to the NetApp defaults (snap schedule = 0 2 6@8,12,16,20, snap reserve = 20%, fractional reserve = 100%).
SAN – Full Reservations	This preset automatically configures the volume for LUNs with 100% fractional reserve.
SAN – AutoDelete	This preset automatically configures the volume with 0% snap reserve, 0% fractional reserve and snapshot auto-delete enabled.
SAN – AutoGrow and AutoDelete	This preset automatically configures the volume with 0% snap reserve, 0% fractional reserve, snapshot auto-delete enabled, and volume auto-grow enabled. The auto-grow increment and max values are 0, which means the volume auto-growth is the ONTAP defaults.
SnapVault Destination	This preset automatically configures the volume with 0% snap reserve and no local snapshot schedule.
Root	This preset automatically determines the minimum size for the root flexvol. This also flags the volume as the root volume. Only one volume can have the root designation.
Manual	This allows for complete manual configuration of all values.

4.7.4 Sizing Section

Fields	Description
Size	Enter the size of the volume.
Unit	Choose the unit (MB, GB, or TB) for the volume.
Snap Reserve	Enter the Snap Reserve % for the volume.
Fractional Reserve	Enter the Fractional Reserve % for the volume.

4.7.5 Space Management Policy Section

Fields	Description
Volume Auto-Grow	Enables volume AutoGrow option for the volume. This will also enable the entry of AutoGrow Increment and AutoGrow Max fields.
Snapshot Auto-Delete	Enabled snapshot auto-delete option for the volume.
AutoGrow Increment	The increment by which the volume will AutoGrow when the volume's space threshold is met.
AutoGrow Max	The maximum allowed size for the volume to grow to.
Try First	If AutoGrow and AutoDelete options are both enabled, this will determine which space management option is executed first.

4.8 Qtrees

This workspace tab allows you to create and configure Qtrees.

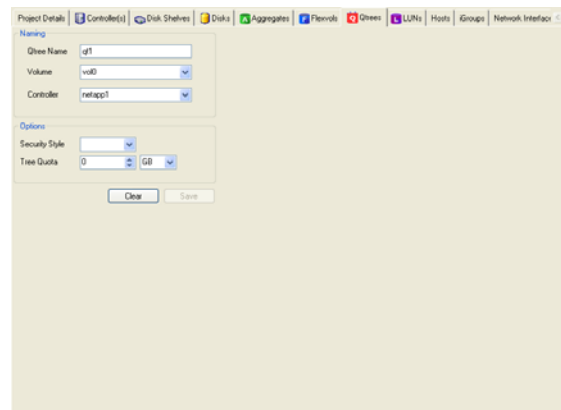
The screenshot shows a software interface for configuring Qtrees. At the top, there's a navigation bar with tabs: Project Details, Controllers, Disk Shelves, Disks, Aggregates, Pools, Qtrees (selected), LUNs, Hosts, Groups, and Network Interface. Below this, the 'Qtrees' tab is active. It contains two main sections: 'Naming' and 'Options'. In the 'Naming' section, there are three dropdown menus: 'Qtree Name' (set to 'qt1'), 'Volume' (set to 'vol0'), and 'Controller' (set to 'netapp1'). In the 'Options' section, there are two dropdown menus: 'Security Style' (set to 'Standard') and 'Tree Quota' (set to '0 GB'). At the bottom of the form, there are two buttons: 'Clear' and 'Save'.

Figure 33 - Qtrees Tab

4.8.1 Naming Section

Fields	Description
Qtree Name	Enter/edit the name of the qtree.
Volume	Choose the volume where you want this qtree to reside. This list only contains volumes on the chosen controller.
Controller	Choose the controller where you want this qtree to reside.

4.8.2 Options Section

Fields	Description
Security Style	Choose the security style for this qtree. If left blank, then this qtree's security style is inherited from the containing volume's security style. Mixed mode is not preset on this list because the use of mixed mode is a poor practice.
Tree Quota	Enter the size of the tree quota. This value is used to calculate the size requirements for a volume when the Automatically Size Volume based on Contents option is set from the Flexvols tab.

4.9 LUNs

This workspace tab allows you to create and configure LUNs.

There are three presets that can be used to determine how the LUN are mounted. These presets determine which fields are available on the form. Currently SnapDrive for UNIX-mounted LUNs are not supported.

The screenshot displays the 'LUNs' configuration tab within the NetApp Synergy interface. The top navigation bar includes tabs for Project Details, Controller(s), Controller Port(s), Disk Shelves, Disks, Aggregates, Flexvols, Qtrees, LUNs (selected), Hosts, and Groups. The main configuration area is divided into several sections:

- Naming:** LUN Name (lun2), Qtree (dropdown), Volume (vol01), and Controller (netapp1).
- Sizing:** LUN Size (5) and Unit (GB) are set to 5.0. Under 'Per Backup', 'Total Space' is set to 20 and 'Fractional Reserve' is set to 100. The 'Effective Size' is calculated as 11.0 GB.
- Options:** 'LUN Reservation' is checked. 'iGroup' is a dropdown menu. 'LUN Type' is set to 'solaris', 'LUN ID' is 3, and there are fields for 'Resource Group' and 'Comment'.
- Mount:** A 'Mount Point' field is present.
- Presets:** Radio buttons for 'iGroup Mapped LUNs', 'SnapDrive for Windows', 'SnapDrive for Windows (MSCS)', and 'SnapDrive for Unix'.

'Clear' and 'Save' buttons are located at the bottom right of the configuration area.

Figure 34 - LUNs Tab

4.9.1 Naming Section

Fields	Description
LUN Name	Enter/edit the name of the LUN.
Qtree	Choose the qtree where you want the LUN to reside, if applicable. The list only contains qtrees for the chosen volume.
Volume	Choose the volume where you want the LUN to reside. The list only contains volumes on the chosen controller.
Controller	Choose the controller where you want this LUN to reside.

4.9.2 Sizing Section

Fields	Description
LUN Size	Enter the size of the LUN.
Unit	Choose the unit for the LUN size (MB, GB, or TB).
Per Backup	If chosen, this allows for the calculation of the space needed for changes in the volume based on number of backups to keep with a given change rate between each backup.
Total Space	Allows for the direct input of the space needed for changes in the volume as a percentage of the LUN size.
Fractional Reserve	The fractional reserve for the volume (Read only). This value is displayed to show the calculation of the effective size of the LUN.

4.9.3 Mount Point Section

Fields	Description
Mount Point / Drive Letter	Depending on the LUN preset chosen, this is where the mount point, Volume Mount Point (VMP), or drive letter is entered.

4.9.4 Presets Section

Fields	Description
iGroup Mapped LUNs	This preset enables the selection and mapping of the LUN to an iGroup. The pull down menu only displays names of previously defined iGroups.
SnapDrive for Windows	This preset enables the selection and mapping of a LUN to a windows host (non-MSCS). The pull down menu only displays hosts that have a Windows operating system defined.
SnapDrive for Windows (MSCS)	This preset enables the selection and mapping of a LUN to a Windows cluster. The pull down menu only displays Cluster Group names specified in the hosts section.

4.10 Hosts

This workspace tab allows you to create and configure SAN hosts and HBAs installed on each host. Hosts and HBAs are added via the *SAN>Hosts* sidebar tree view. Right-click on the Hosts tree view to enable the menu so you can add a host or HBA.

Figure 35 - Hosts Tab

4.10.1 Host Information Section

Fields	Description
Hostname	Enter or edit the hostname of the server.
Operating System	Choose the OS for the server.
Cluster Group	Enter or edit the name of the Cluster Group, if the server is a member of a MSCS cluster. This is only available if a Windows operating system is chosen.
SnapDrive Service Account	The name of the service account that SnapDrive runs as on this server.

4.10.2 Host Bus Adapters Section

Fields	Description
HBA Name	Enter or edit the name of the HBA. This is a general description of the HBA. If multiple HBAs are in the same server, then the name must be unique. Examples include: hba1, hba2, top, bottom, slot1, slot2, etc.
HBA Manufacturer	The manufacturer of the HBA (QLogic, Emulex, etc.).
HBA Model	The model number of the HBA (QLA2342, LP11000, etc.),
Address (WWPN or IQN)	Enter or edit the address of the HBA. This can be the WWPN for a FC HBA or an IQN address for an iSCSI HBA (or software initiator).
Firmware Version	The version of the firmware on the HBA. This does not apply to software initiators.
Driver Version	The driver version for the HBA.
Multipath Driver	The name of the multipath software used for this HBA.
Alias	This is the alias that is applied to the HBA on the SAN (Read only).

4.11 iGroups (SDS Advanced only)

This workspace tab allows you to create and configure iGroups. This tab is broken up into two different sections. The iGroup Explorer is a tree view of each controller and the iGroups that reside on that controller. Each iGroup contains the HBAs that make up the iGroups membership.

Initiator Groups are added using the iGroup Info section. Adding an HBA to the iGroup is performed by dragging and dropping HBAs from the Hosts tree view (on the sidebar) to the appropriate iGroup in the iGroup Explorer.

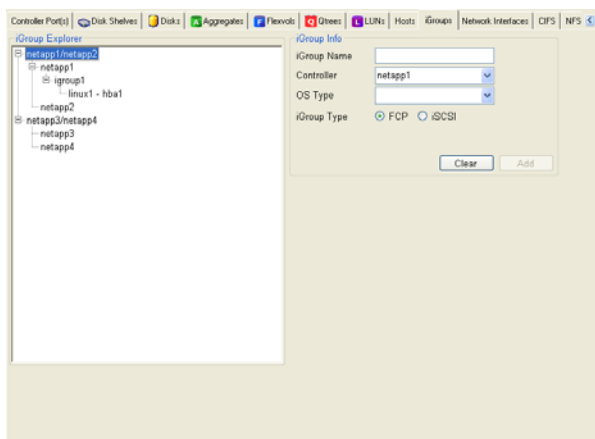


Figure 36 - iGroups Tab

4.11.1 iGroup Info Section

Fields	Description
iGroup Name	Enter or edit the name of the iGroup.
Controller	Choose the controller where you want to place this iGroup.
OS Type	Specify the type of iGroup (default, Solaris, Windows, HP-UX, AIX, Linux, Netware, and VMware).
iGroup Type	Choose the type of the iGroup (FCP or iSCSI).

4.12 Network Interfaces (SDS Advanced Only)

This workspace tab allows you to manage the network configuration of the Ethernet interfaces on the controlled. To configure a network interface; double-click on the interface in the Network tree view (located in the Controllers sidebar). When the changes to the interface are completed, click on the **Save** button.

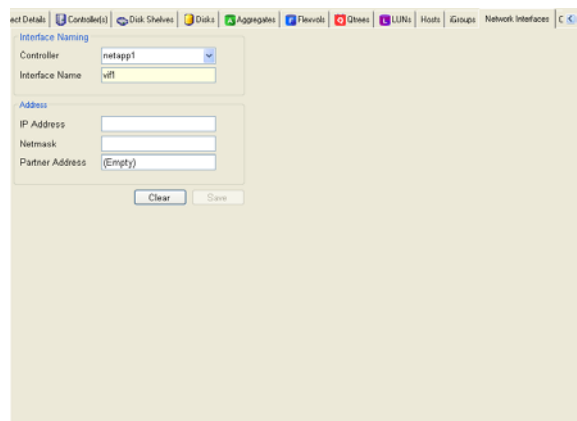


Figure 37 - Network Interfaces Tab

4.12.1 Interface Naming Section

Fields	Description
Controller	The controller where this interface is located.
Interface Name	The name of the interface (Read only).

4.12.2 Address Section

Fields	Description
IP Address	Enter or edit the IP address for this interface.
Netmask	Enter or edit the Netmask address for this interface.
Partner Address	Enter or edit the partner address for this interface.

4.13 CIFS (SDS Advanced only)

This workspace tab allows you to create and configure CIFS shares. Access Control Lists (ACLs) can be added to any share.

Use the CIFS Share Explorer to add and delete shares. The right-click menu in this tree view gives you access to the Add Share and Add ACL functions.

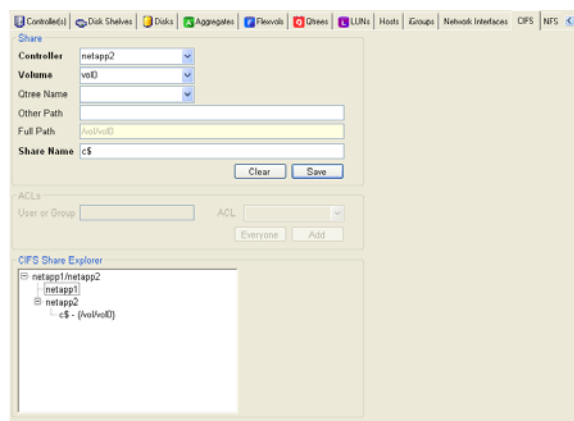


Figure 38 - CIFS Tab

4.13.1 Share Section

Fields	Description
Controller	Choose the controller where the CIFS share resides. (required)
Volume	Choose the volume where the CIFS share resides. (required)
Qtree Name	Choose the qtree where the CIFS share resides. (optional)
Other Path	Enter any extra path information that is part of the controller-centric path to the share. For example, if the whole path to the share is <i>/vol/vol2/qtree1/some/other/directory</i> , then choose <i>vol2</i> for the volume pull down menu, <i>qtree1</i> on the qtree pull down menu and enter <i>some/other/directory</i> in the Other Path field.
Full Path	This shows the full controller-centric path to the CIFS share. (Read only).
Share Name	Enter or edit the name of the CIFS share.

4.13.2 ACLs Section

Fields	Description
User or Group	Enter or edit the name of the user or group that the share is in the Access Control List for this share. This can be a local or domain account. There is no checking that the user or group name is a valid name.
ACL	Enter or edit the permission level for this user or group.

4.14 NFS (SDS Advanced only)

This workspace tab allows you to create and configure NFS exports.

The Exports grid is a read-only list of all NFS exports configured as part of the project. Exports in this list can be selected and then deleted with the delete button.

Note: Synergy Storage Design Studio does not support the `-actual` flag.

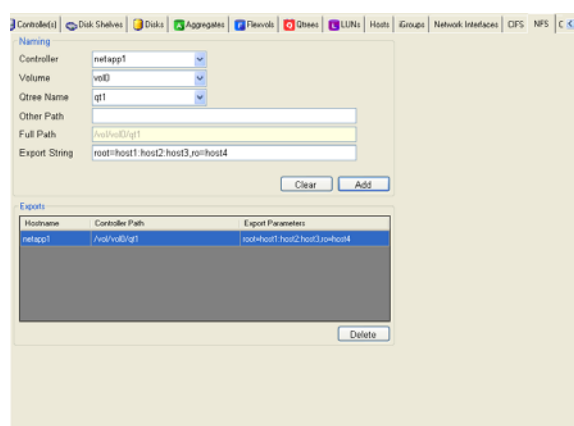


Figure 39 - NFS Tab

4.14.1 Naming Section

Fields	Description
Controller	Choose the controller where the NFS export resides. (required)
Volume	Choose the volume where the NFS export resides. (required)
Qtree Name	Choose the qtree where the NFS export resides. (optional)
Other Path	Enter any extra path information that is part of the controller-centric path to the share. For example, if the whole path to the export is <i>/vol/vol2/qtree1/some/other/directory</i> , then choose <i>vol2</i> for the volume pull down menu, <i>qtree1</i> on the qtree pull down menu and enter <i>some/other/directory</i> in the Other Path field.
Full Path	This shows the full controller-centric path to the CIFS share. (Read only)
Export String	Enter or edit the export string (as it would be entered in the <i>/etc/exports</i> file).

4.15 SnapMirror (SDS Advanced Only)

This workspace tab allows you to create and configure SnapMirror relationships.

The screenshot displays the SnapMirror configuration interface. At the top, there are tabs for various system components: Disks, Aggregates, Flexvols, Qtrees, LUNs, Hosts, Groups, Network Interfaces, CIFS, NFS, Options, SnapMirror, and Multitask. The SnapMirror tab is active. The interface is divided into several sections: 'Define' (Source and Destination fields), 'Options' (KBS Throttle, TCP Window Size, Synchronous, Outstanding), 'Schedule' (Minute, Hour, Day of Month, Day of Week), and 'Relationships' (a table listing existing relationships). The Source fields are set to Controller: netapp1, Volume: vol0, and Qtree Name: . The Destination fields are set to Controller: netapp2, Volume: vol0_mirror, and Qtree: . The Schedule section has empty fields. The Relationships table has one entry with Source Path: netapp1:vol0 and Destination Path: netapp2:vol0_mirror. Buttons for 'Clear', 'Add', and 'Delete' are located at the bottom right of the Relationships section.

Figure 40 - SnapMirror Tab

4.15.1 Source Section

Fields	Description
Controller	Choose a controller you want to be the source controller in this SnapMirror relationship.
Volume	Choose the volume you want to be the source volume in this SnapMirror relationship.
Qtree Name	Choose the Qtree you want to be the source Qtree in this SnapMirror relationship, if using QSM.

4.15.2 Destination Section

Fields	Description
Controller	Choose a controller you want to be the destination controller in this SnapMirror relationship.
Volume	Choose the volume you want to be the destination volume in this SnapMirror relationship.
Qtree Name	Choose the qtree you want to be the destination qtree in this SnapMirror relationship, if using QSM.

4.15.3 Options Section

Fields	Description
KBS (Throttle)	Enter or edit the throttle value for this SnapMirror relationship, in Kilobytes per Second. A blank entry results in no throttle.
TCP Window Size	Enter or edit the TCP window size for this SnapMirror relationship.
Synchronous	Sets the SnapMirror relationship to be Synchronous.
Outstanding	Sets the number of outstanding operations allowed before the relationship falls into Asynchronous mode. Only available when Synchronous is enabled.

4.15.4 Schedule Section

Fields	Description
Minute	Enter or edit the minute(s) of the SnapMirror schedule. If left blank, a "-"(dash) will be placed in the snapmirror.conf.
Hour	Enter or edit the hour(s) of the SnapMirror schedule. If left blank, a "-"(dash) will be placed in the snapmirror.conf.
Day of Month	Enter or edit the day of the month of the SnapMirror schedule. If left blank, a "-"(dash) will be placed in the snapmirror.conf.
Day of Week	Enter or edit the day or the week of the SnapMirror schedule (0-6). If left blank, a "-"(dash) will be placed in the snapmirror.conf.

4.16 MultiStore (SDS Advanced only)

This workspace tab allows you to create and configure virtual filers. Selection of the protocols allowed by the virtual filer is performed here.

The screenshot shows the 'Naming' tab within the MultiStore workspace. The interface includes a top navigation bar with tabs for Disks, Aggregates, Flexvols, Qtrees, LUNs, Hosts, iGroups, Network Interfaces, CIFS, NFS, Options, SnapMirror, and MultiStore. The 'Naming' section contains the following fields and options:

- vFiler Name:** A text input field containing 'vFiler1'.
- Controller:** A dropdown menu with 'netapp1' selected.
- IP Space:** A dropdown menu with 'ipspace1' selected.
- IP Address:** A text input field containing '10.10.10.51'.
- Allowed Protocols:** A section with two columns of checkboxes:
 - Column 1: ☒ CIFS, ☒ NFS, ☒ RSH.
 - Column 2: ☒ iSCSI, ☒ FTP, ☒ HTTP.
- Buttons:** 'Clear' and 'Save' buttons are located at the bottom right of the configuration area.

Figure 41 - Multistore Tab

4.16.1 Naming Section

Fields	Description
vFiler Name	Enter or edit the name of the virtual filer.
Controller	Choose the controller this virtual filer will reside on.
IP Space	Choose the IP Space the virtual filer will be a member of.
IP Address	Enter or edit the primary IP address for this virtual filer.
Allowed Protocols	Check the protocols allowed on this virtual filer.

4.17 FC Switches

This workspace tab allows you to create and configure FC switches. The Switch Name, Switch Modules, and Port Configuration sections are activated independently, depending on which option is chosen from the right click menu.

Individual ports are configured automatically upon creation of the switch or switch module. The only detail available for switch ports is the VSAN number (on Cisco switches only).

Configuring the HBAs that are connected to each port is performed by dragging the HBA (from the Hosts tree view in the SAN sidebar) to the switch port in the Switch Explorer on the FC Switches tab.

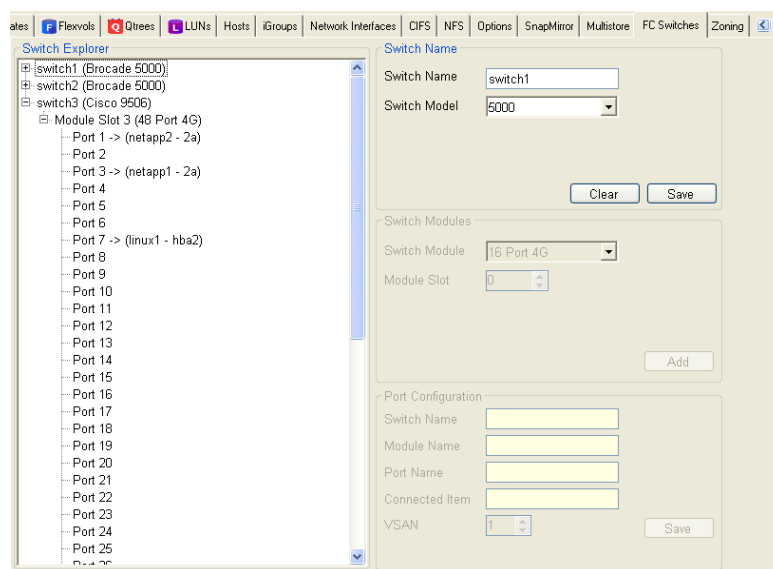


Figure 42 - FC Switches Tab

4.17.1 Switch Name Section

Fields	Description
Switch name	Enter or edit the name of the FC switch.
Switch Model	Choose the Switch model.

4.17.2 Switch Modules Section

Fields	Description
Switch Module	Choose the module to add to the switch.
Slot	Enter the slot number the module will reside in.

4.17.3 Port Configuration Section

Fields	Description
Switch Name	The name of the switch this port resides on. (Read only)
Module Name	The name of the module this port resides on. (Read only)
Port Name	The name of the port. (Read Only)
Connected Item	Displays which HBA that is currently connected to this port. (read only)
VSAN	Enter the VSAN number for this port. (Cisco switches only)

Zoning (SDS Advanced only)

This workspace tab allows you to create and configure zones and ZoneSets.

Zone members are added by dragging HBAs from the Hosts tree view in the SAN sidebar into each zone. Additionally, the target ports from the controller can be added to the zone by dragging the ports from the Target Ports tree view (also in the SAN sidebar).

Adding zones or ZoneSets can be reached from the right-click menu in the Zone Explorer tree view. To add a zone, right-click on the switch or the zoneset in the tree view. To add a zoneset, right-click on the switch name in the Zone Explorer. Zones can be moved into or out of a zoneset by performing drag-and-drop operations within Zone Explorer.

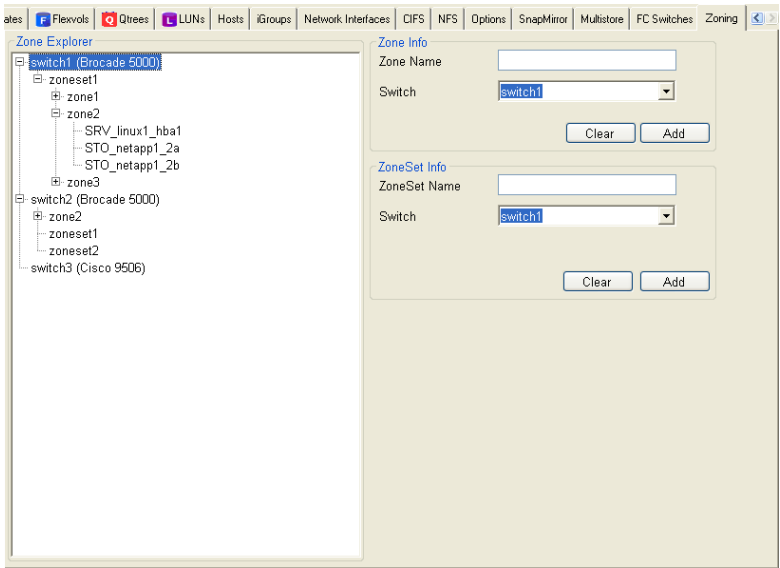


Figure 43 - Zoning Tab

4.17.4 Zone Info Section

Fields	Description
Zone Name	Enter or edit the name of the zone.
Switch	Choose the switch the zone will reside on.

4.17.5 ZoneSet Info Section

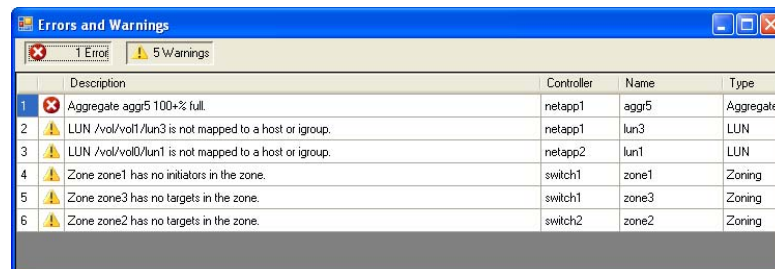
Fields	Description
Zoneset name	Enter or edit the name of the zoneset.
Switch	Choose the switch the zoneset will reside on.
Phone	NetApp Sales Order number.
Project Manager	PSA Project Number (only for NetApp internal and CDP)

5 Warning and Error Engine

The warning and error engine provides a method for Synergy to inform the user about configuration errors prior to implementation of the design in the field. The engine runs each time a change is made to the design. There are two different levels of configuration issues:

- **Warning** – A configuration that does not follow best practices.
- **Error** - a configuration issue that results in a configuration that can't be built; for example, an aggregate that does not have enough space to create all flexible volumes that reside in the aggregate.

The quantity of errors and warnings is displayed in the status bar at the bottom of the application window. Clicking on either box opens a detailed display of all errors and warnings. In most cases, clicking on the error or warning in this dialog selects the appropriate tab in the workspace and populates the form with all relevant information.



	Description	Controller	Name	Type
1	Aggregate agg5 100+% full.	netapp1	agg5	Aggregate
2	LUN /vol/vol1/lun3 is not mapped to a host or igroup.	netapp1	lun3	LUN
3	LUN /vol/vol0/lun1 is not mapped to a host or igroup.	netapp2	lun1	LUN
4	Zone zone1 has no initiators in the zone.	switch1	zone1	Zoning
5	Zone zone3 has no targets in the zone.	switch1	zone3	Zoning
6	Zone zone2 has no targets in the zone.	switch2	zone2	Zoning

Figure 44 - Errors and Warnings Dialog

6 Output Plugins

Synergy provides several different output forms via a plug-in interface, allowing Synergy to pass information about the current storage design to the plug-in and then produce output to the user. If you are using Synergy Design Studio Lite, the only option you have to output data is to a Cabinet Visio diagram; however, if you are using SDS Advanced, you have additional output options for your storage design information.

The following diagrams illustrate the different output options based on the version of Synergy you are using:

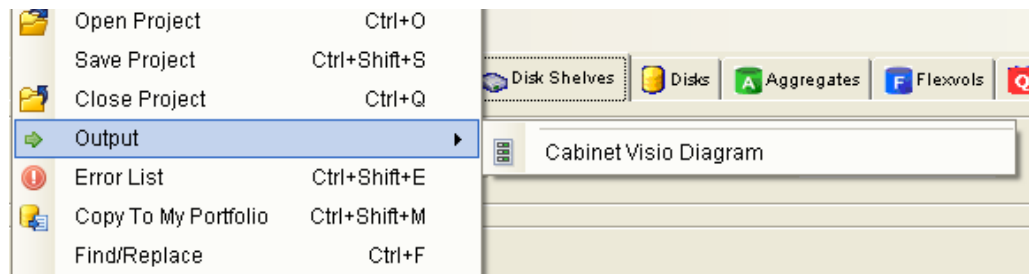


Figure 45 - Output Options – SDS Lite

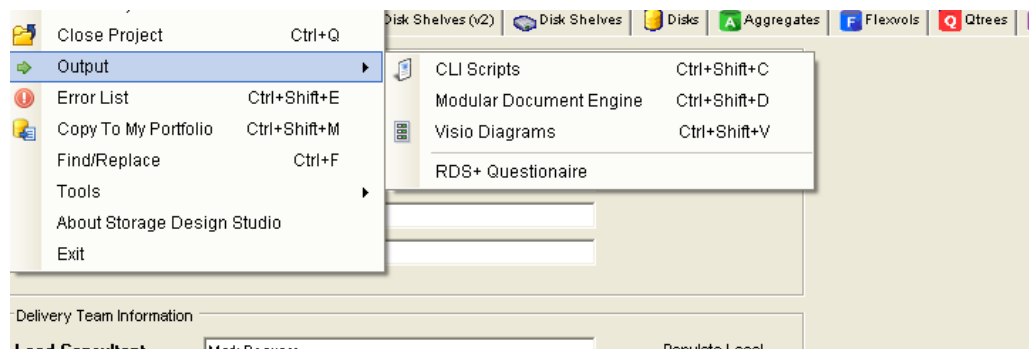


Figure 46 - Output Options – SDS Advanced

Output plug-ins are installed separately from the Synergy product and launched from the Output menu in Synergy. Synergy automatically discovers output plug-ins at startup. If you install plug-ins while Synergy is still running, you are then unable to utilize them until you restart your system

NOTE: The output menu is disabled when the current project has one or more errors. Be sure to correct all errors in the project before attempting to generate any output.

WARNING!!!

DO NOT blindly trust the output from this tool. It is possible you have made an input error to the tool. It is also possible that the plug-in has made an output error.

DO NOT use the output from the plug-in until you have verified it is correct in all respects.

You are ultimately responsible for correct implementation.

There is NO IMPLIED WARRANTY in the correctness of the output.

6.1 CLI Output

The CLI Output Plugin creates command line scripts that can implement the storage design created in the currently opened project. The plugin produces output for NetApp controllers, SnapDrive for Windows Command Line, and FC switches. When the plugin completes creation of all commands, it opens an Explorer window to the directory where the output is located.

6.1.1 Controller Output

The output for NetApp controllers is suitable to cut and paste directly into the controller's console. The output files are named <controllername>_cmds.txt.

Note: It is highly recommended that you cut and paste the output in command groups. This means to issue all commands of a particular type before moving on to the next section. For example, cut and paste all aggregate commands and verify that all commands completed properly before moving onto the volume commands. This helps you to avoid any consequences of issuing a command before the previous command that it depends on has finished. An example of this problem is the asynchronous nature of the `aggr` command. The command results immediately, but the aggregate is built in the background. Immediately issuing a `vol` command shortly after the `aggr` command may fail because the aggregate may not be completely built at the time the `vol` command is issued.

6.1.2 Snapdrive for Windows Output

The output for Snapdrive for Windows is suitable to cut and paste on the console (or command prompt) of a Windows server. The output creates, configures, and mounts the LUN mapped to that host. The output files are named <hostname>_snapdrive.txt.

In the case of a SnapDrive LUN mapped to a MSCS cluster, the output file only needs to be run from a single host in the cluster. The output files are named <ClusterGroup>_snapdrive.txt.

6.1.3 Switch Output

The output for Fibre Channel switches is suitable to cut and paste directly into the switch's console. The output file is named <switchname>_switchconfig.txt for switch configuration commands, and <switchname>_zoning.txt for zoning commands.

6.2 Word Output

The Word output plugin creates an as-built document detailing the storage design in the currently opened project. Selecting the option opens a file selection dialog box. Select the Word template you want the plugin to use. The plugin then populates the document and saves the file. Once completed, the plugin opens an Explorer window to the directory where the output is located.

6.3 Visio Diagrams

The Visio output plugin creates a visio diagram that draws the front and rear views of the NetApp controllers in the currently opened project. The front view draws one page per cluster and shows each

cabinet and position of the disk shelves and controllers within each cabinet. Each device is labeled with relevant information. This view is limited to 6 storage cabinets. The rear view draws one page per cluster and shows the rear of each controller and disk shelf. The disk shelves are arranged into groups (of up to 6 shelves) that represent a disk loop. The first shelf in each disk loop shows the connectivity from the controller to the shelf (for both A and B modules of the shelf).

7 Synergy Plugins

Synergy also consists of a series of modeling and visualization tools which are easy to use and can help you explore multiple solutions for any provisioning challenge. When running Synergy for the first time, a main screen appears with tips for getting started using Synergy. In the left command menu bar you see the following tabs that can be selected to perform various functions:

- **My Portfolio** – a collection of projects and solutions where you can store all of your solutions in one place so you can collaborate with other Synergy users.
- **Reference Hardware** – a list of supported reference configurations for hardware, software, and services.
- **Capacity Modeling** – a wizard that guides you through the steps needed to build a simple configuration.
- **Environmental Modeling** – Comprised of the Green Visualizer tool, this application allows you to analyze energy and space requirements for your configuration. This tool also shows you basic data center fundamentals so you can properly size and adjust settings in your configuration.
- **Performance Modeling** – consisting of three performance and sizing tools, this tool allows you to resize applications, databases, and Exchange 2003/2007 deployments.
- **Org Chart Builder** – a tool that allows you to build an organization chart and map relationships between individuals in that organization.
- **Tools** – a set of options that allow you to perform administrative functions like checking for software updates, adding and generating license keys, and logging into the NetApp Partner Center.

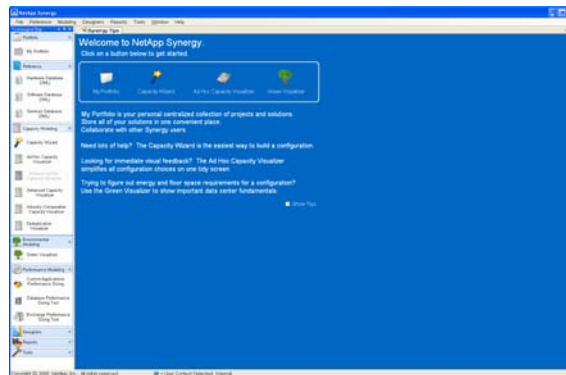


Figure 47 - Synergy Welcome Page

7.1 My Portfolio

Synergy also consists of an application that allows you to create a centralized collection point for information about your customers and account opportunities. My Portfolio provides an easy-to-use location for storing modeling results from the various modeling tools found within Synergy.

Using My Portfolio, you can retrieve previously stored modeling results and collaborate with other Synergy users.

You can launch My Portfolio in one of three ways:

- In the Welcome window, click the icon for My Portfolio.
- In the taskbar, open **File** and choose **My Portfolio**.
- In the left menu bar, click **My Portfolio**.

Three folders appear under the folder All Projects in the My Portfolio file tree. They are:

- My Projects
- Templates
- Modeling



Figure 48 - Project Folder Tree

These folders are included in the default installation and cannot be deleted; however, you can create any folders under them.

7.2 My Portfolio Folder Management

Folders and their contents are at the heart of My Portfolio’s functionality. To explore the folder structure of My Portfolio, follow these steps:

Step	Action
1.	Expand the Templates folder in My Portfolio. Within this folder are several examples of portfolios. These include: • Samples (NetAppU) • Solution Sets (Auto Populated) • CAT Best Practice Results • Org Chart Sample
2.	Double-click (Samples) NetAppU.
3.	Expand ACME International (Organized by Geography) .  In this example, geographic areas are used to organize information; however, you can arrange folders to your own needs and tastes.

7.3 File management menu

Synergy is designed for flexibility so you can configure your solution content to your individual style. Context-sensitive menus appropriate to the folder you are working on are central to this utility. Right-click on any folder in My Portfolio to open the options menu appropriate for that folder. To familiarize yourself with the menu structure, begin with the File Management menu.

Right-click on a subject folder in your file tree to open the File Management menu. This menu allows you to:

- Rename project folders
- Add project folders
- Add solutions

- Add notes anywhere within this hierarchy
- Add appointments to remind you of upcoming events
- Cut
- Copy
- Paste
- Delete
- Leverage the Synergy XML structure to export and import files

7.4 Rename a project folder

To rename a folder in My Portfolio, follow these steps:

Step	Action
1.	Under ACME International, right-click on Appointments . Select Rename Project Folder .
2.	The Rename Project Folder window opens. In the Rename Project Folder window, type the new folder name in the Project Folder Name text box. Click Save Project Folder , or hit Enter .

7.5 Add and move a project folder

To explore adding and repositioning content in My Portfolio, follow these steps:

Step	Action
1.	Right-click on ACME International .
2.	In the File Management menu, click Add Project Folder .
3.	The Add Project Folder window opens. In the Project Folder Name text box, type in the name of your new folder. Click Save Project Folder . Notice that the new folder saves at the bottom of the file tree.

7.6 Adding and Moving a Project Folder

You can also add and move a project folder from one location to another by following these steps:

Step	Action
1.	To move the folder, right-click on it and select Cut in the File Management menu. Right-click on the new location for this folder, for example ACME International > North America , and select Paste . Note: To move folders, drop-and-drag does not work.

7.7 Add folder content

To add content to folders in My Portfolio, follow these steps:

Step	Action
1.	Right-click on the folder where you want to add content. Click Add Solution .
2.	The Add Solution window opens. In the Solution Name text box, type in the name of your solution, for example, Exchange . Click Save Solution .
3.	Right-click on the solution you created. The Solution Management menu opens. This menu allows you to: • Rename a solution • Add hardware • Add software • Add services

	• Add a note • Add appointments • Cut • Copy • Paste • Delete
4.	Select Add Hardware .
5.	Explore the choices available and select the hardware configuration you want. Click Add Platform .
6.	Again, Right-click on the solution you created. The Solution Management menu opens. Select Add Software .
7.	Explore the choices available and select the software configuration you want. Click Add Software .
8.	One more time, Right-click on the solution you created. The Solution Management menu opens. Select Add Notes .
9.	The Add Note window opens. You can type any kind of text you want, including URL addresses, in this text file. Click Save Note. Note: The note becomes part of the name listed. Incorporate a short, descriptive line, press Enter, and begin your note.

8 Reference Databases

Synergy also consists of an application that allows you to view supported reference configurations for hardware, services and software. This is especially helpful when you want to verify that a specific configuration is supported before attempting to implement the solution in a customer environment.

You can launch the reference databases in one of two ways:

- In the taskbar, open **File** and choose **Reference**.
- In the left menu bar, click **Reference**

Three folders appear under the folder All Projects in the My Portfolio file tree. They are:

- Hardware
- Software
- Services

You can view supported configurations in these reference databases by simply selecting the database you want to view and then locating the configuration in the list provided. The three figures below show examples of supported Synergy hardware, software, and services.

9 Capacity Modeling

9.1 Capacity Wizard

The Synergy Capacity Wizard is a set of GUI screens that help you to build a simple configuration that you can use for modeling and analysis purposes.

You can launch the Capacity Wizard in one of three ways:

- In the **Welcome** window, click the icon for **Capacity Wizard**.
- In the top menu bar, open **Modeling** and choose **Capacity Wizard**.
- In the left menu bar, click **Capacity Modeling**, then select **Capacity Wizard**.

To build a configuration using the Capacity Wizard, follow these steps:

Step	Action
1.	Launch the Capacity Wizard in one of the three ways listed above. The first page is displayed.
2.	Click the Next Step arrow to go to the next step.
3.	You are then asked to either increase or decrease the capacity you need for your configuration by clicking on the Decrease Capacity and Increase Capacity arrows. When you are finished, click Next Step to continue.
4.	You see a list of supported platforms and Data ONTAP versions based on the capacity requirements you set in the previous screen. Select your platform and Data ONTAP version from the list provided in the fields. Click Next Step to continue.
5.	Select the type of disk storage you want to use (Fibre Channel, SAS, or SATA). You are also prompted whether you want to use a lot of disks or fewer disks, but with higher capacity. After answering these questions, click Next Step to continue.
6.	You see a Results page with the different settings you have selected for your configuration. Verify these settings are correct. If they are correct, click Next Step to continue.
7.	The Capacity Wizard then builds your configuration with the settings you provided. After this is complete, you see a final page which asks you what you would like to do with the results. You are given the option of printing the results, copy the results to your My Portfolio folder, or discard the results. Click on the icon next to your selection. The wizard then closes.

9.2 Ad Hoc Capacity Visualizer

The Ad Hoc Capacity Visualizer tool is used to compare different solutions and then see the overall impact of the changes you have made.

You can launch Ad Hoc Capacity Visualizer in one of three ways:

- In the **Welcome** window, click the icon for **Ad Hoc Capacity Visualizer**.
- In the top menu bar, open **Modeling** and choose **Ad Hoc Capacity Visualizer**.
- In the left menu bar, click **Capacity Modeling**, then select **Ad Hoc Capacity Visualizer**.

All on one screen, the Ad Hoc Capacity Visualizer gives you a high-level of flexibility in a consolidated information platform with three tabs (Allocations, Efficiency, and Specifications) that you can select to view detailed information at a granular level. As you set parameters in the input selections area, notice that the information displayed in the other quadrants changes to reflect your choices.

The areas that make up the Ad Hoc Capacity Visualizer screen are as follows:

- The upper left quadrant is used for input selections.
- The lower left quadrant shows the calculations derived from those input selections.
- The right display bar gives you graphical representations of the same data.

9.3 Input data

To explore inputting data in Ad Hoc Capacity Visualizer, follow these steps:

Step	Action
1.	In the upper left quadrant, set the parameters of your solution. Refer to the following example: <u>Note: If you enter information out of order from what is listed below, you will not have expected parameter choices. For example, if Platform is set to StoreVault S300, then X279A is not listed under Drive Type. (StoreVaultS300 does not support X279A.)</u> Computation base • Base 2 (default value) • Base 10 Vendor • NetApp (default value) • EMC Operating System • Choices dependent on vendor selection Platform • Choices dependent on vendor and operating system selected Drive Type • Choices dependent on vendor, operating system, and platform selected Quantity of Shelves • Range changes depending on previous parameters
2.	After choosing the basic configuration of your solution, set the details: • Under Operational Configuration Selections, select the RAID type you want. • Under Hot Spares, adjust the number of Hot Spares you want. • Under Disk per Group, set the number of disks you want. <u>Note: Sixteen (16) disks is the default for RAID-DP. If you change the RAID type to RAID-4, then the default changes to eight (8).</u> • Under Snapshot Reserve, adjust the Snapshot reserve percentage
3.	Adjust hot spares and disks per group in one of three ways, depending on how you like to work: • Use the arrow buttons. • Use the slider up or down. • Click on the number field and use the Number Chooser to populate the number.
4.	Adjust Snapshot reserve using the dial, or click on the number field and use the Number Chooser.

9.4 Data calculations

Once your parameters are set, the calculations for your solution are displayed in the lower left quadrant of the Ad Hoc Capacity Visualizer. These numbers reflect the input you chose.

For illustrative purposes, set the following parameters in the Ad Hoc Capacity Visualizer:

- Comp Base: **Base 10**
- Vendor: **NetApp**
- OS: **DOT 7.2.3**
- Platform: **FAS3050**
- Drive Type: **X276A (300 GB FC, 10k**

- Quantity Shelves: **20**
- RAID Type: **RAID-DP**
- Hot Spares: **2**
- Disk per RAID Group: **20**
- Snapshot Reserve: **10%**

9.5 Data graphics

In the right display bar of the Ad Hoc Capacity Visualizer, there are graphical representations of the information you entered. There are three tabs, each showing different interpretations of your solution data. They are:

- **Allocations** help you describe how the components of your solutions are being used.
- **Efficiency** allows you to do direct comparisons with other solutions, including the competition.
- **Specifications** facilitates saving your solutions into My Portfolio.

Note: When you change parameters in your solution, the information in these tabs changes dynamically.

9.6 Compare efficiency of solutions

A compelling way to use the graphs in Ad Hoc Capacity Visualizer is to compare different solutions, especially their efficiency data views. Follow these steps to compare the efficiency views of solutions:

Step	Action
1.	Open your first solution.
2.	Click on Clone in the bottom options tray of Ad Hoc Capacity Visualizer. A second Ad Hoc Capacity Visualizer window opens.
3.	Move the copy so it is open beside the original. Alter data in the second Ad Hoc Capacity Visualizer window as you wish. For example: • Vendor: EMC • Quantity Shelves: 4 • RAID Type: RAID-1/0 • Select Enable SnapView Mirroring

9.7 Save solutions to my portfolio

To save your solutions or share them with other Synergy users, follow these steps:

Step	Action
1.	In the left menu bar of Ad Hoc Capacity Visualizer, click My Portfolio .
2.	In the bottom options tray of Ad Hoc Capacity Visualizer, click Copy to My Portfolio . Synergy copies your solution to My Portfolio under Modeling .
3.	In My Portfolio, cut and paste your solution into the folder you want.

9.8 Save modeling tool results

A powerful feature of My Portfolio is the ability to take results from Synergy modeling tools and store them. To explore this ability, follow these steps:

Step	Action
1.	Click Capacity Modeling in the left menu bar, and then select Ad Hoc Capacity Visualizer .
2.	The Ad Hoc Capacity Visualizer window opens. Make any adjustments you wish, or accept the default.
3.	At the bottom of the window in the options tray, click Copy to My Portfolio .

4.	The My Portfolio window opens with the results listed in the folder tree.
5.	Right-click on the new folder. Select Rename Project Folder . Rename the folder. Click Save Project Folder to save your folder name.
6.	After renaming the folder, right-click on the folder and select Cut . Select the destination folder for this solution. Right-click on the folder, and select Paste to move the folder.
7.	The solution modeled from the Ad Hoc Capacity Calculator is now stored under the folder you selected.
8.	To view this Ad Hoc Capacity Calculator result, or others, double-click on the calculator icon.
9.	To open a context-sensitive menu, right-click on the calculator file. The Ad Hoc Capacity Visualizer file options menu opens. The options available are: • Copy to another Ad Hoc Capacity Visualizer • Cut • Copy • Delete

9.9 Import and export files

The ability to share information and collaborate with other Synergy users resides in the XML feature of the File Management menu. To explore this feature, follow these steps:

Step	Action
1.	Right-click anywhere in My Portfolio. In the File Management menu, select XML .
2.	There are two choices within the XML option. They are: • Export • Import
3.	You can export your entire portfolio, or just a portion of a folder or subfolder. You can also import information into any selected folder.
4.	Right-click on a folder in My Portfolio. Select XML > Export , and then select From this Project Folder and sub folders .
5.	The Export from this Project Folder to XML window opens. Choose the export destination of the file, name the file, and click Save .
6.	You can now attach this XML file to email and send it to other Synergy users.

10 Environmental Modeling

Synergy provides an environmental modeling tool that you can use to analyze energy and space requirements for your configuration and shows you data center fundamentals. Called the Green Visualizer, you can launch the tool in one of three ways:

- In the **Welcome** window, click the icon for **Green Visualizer**.
- In the top menu bar, open **Modeling** and choose **Environmental Modeling** and select **Green Visualizer**.
- In the left menu bar, click **Environmental Modeling**, then select **Green Visualizer**.

All on one screen, the Green Visualizer gives you a high-level of flexibility in a consolidated information platform with three tabs (Allocations, Costs, and Specifications) that you can select to view detailed information at a granular level. As you set parameters in the input selections area, notice that the information displayed in the other quadrants changes to reflect your choices.

The areas that make up the Green Visualizer screen are as follows:

- The upper top quadrant is used for entering specifications for Cabinet Type, Controller, Shelf, and Switch you are using.
- The bottom quadrant shows the calculations derived from your input selections.
- The right display bar gives you graphical representations of the same data.

11 Performance Modeling Tools

Synergy also provides three performance and sizing tools that can be used to provide sizing information and allows you to customize applications, databases, and Exchange deployments. There are three sizing and performance tools that you can use in Synergy:

- Custom Application Sizer
- Database Sizer
- Exchange 2003/2007 Sizer

The Custom Application Sizer is used to provide system sizing recommendations for sales opportunities where the specific application sizer is not available. To use this sizer effectively, the workload characteristics of the application should be well understood.

The Database Sizer is used to provide accurate system sizing recommendations based upon data input by field personnel pertaining to database-related sales opportunities.

The Exchange sizer is used to provide accurate sizings, enable layout planning and provide sizing recommendations for all platforms for Exchange 2003 and Exchange 2007 deployments.

If you have questions about how to use these performance tools effectively for your application, refer to the FAQ link on the page to be taken to a Wiki page which defines specific requirements and considerations, as well as provide guidance on how to use the tools.

You can launch these performance modeling tools in one of two ways:

- In the File menu, select **Modeling** and choose **Performance Modeling**. Select the tool you want to use.
- In the left menu bar, click **Performance Modeling**, and then select the tool you want to use.

12 Org Chart Builder

Similar to other modeling tools, Synergy gives you the ability to build organizational charts illustrating relationships and people within an organization, which can be useful when you want to define certain relationships between people and divisions within an organization.

You can launch the Org Chart Builder application in one of two ways:

- In the File menu, select **Designers** and choose **Org Chart Builder**.
- In the left menu bar, click **Designers**, and then select Org Chart Builder.
- When building an Org Chart you must understand the relationships people have within a specific organization so you can model these relationships effectively. This tool allows you to define relationships based on a person's responsibilities within an organization so that links can be built between individuals in the organization.

13 Tools

Finally, Synergy gives you the ability to select various options in the Tool menu to further expand Synergy's capabilities and perform maintenance tasks and customize the application. From the **Tools** tab you can select the following:

- Options
- Check for Software Updates
- Attempt NetApp Partner Center Authentication
- Attempt Reset User Context

You can launch options from the Tool in one of two ways:

- In the File menu, select **Tools** and choose one of the three available options in the menu.
- In the left menu bar, click **Tools**, and then select the tool or option you want to select.

13.1 Options – Startup

There are many different options and tasks that you can choose from the **Options** screen. Similar to other applications within Synergy, you can launch the **Options** screen by either navigating to the File menu and selecting **Options**, or selecting the **Options** tab in the left menu bar. When you select **Options** for the first time, you see the following window:

Select whether you want to have Synergy News and Synergy Tips pages displayed every time the application is launched by either checking or un-checking the boxes. When you have made your selection, click **Save All** to save these changes.

13.2 Options – File Resources

The **Options – File Resources** tab displays the current default directories for the Synergy application and the path where My Portfolio files you create are saved. You are not allowed to change the Synergy Application Path (this is read-only), but you can specify directories where you want your My Portfolio files saved.

To change the My Portfolio Default File Path, follow these steps:

Step	Action
1.	Click on the icon to the right of the My Portfolio Default File path. A new window opens with a default directory location where files are currently saved.
2.	Navigate to the directory where you want your files saved and click Save .
3.	Verify the new file path is specified in the My Portfolio Default File path.
4.	You can also specify a directory where backups of your portfolio files can be stored. This is not a required field, but it is recommended that you create backups of your critical files in case of a system crash or loss of data.

To specify a backup location where portfolio files can be saved, follow these steps:

Step	Action
1.	Click on the icon to the right of the My Portfolio Backup Directory field. A new window opens with a default directory location where files are currently saved.
2.	Navigate to the directory where you want your files backed up and saved, and click Save .
3.	Verify the new file path is specified in the My Portfolio Backup Directory path.

13.3 Options – Auto Complete

If naming is not important in your environment, you can use the **Options - Auto Complete** tab to have Synergy use default names for containers. To enable Auto Complete:

Step	Action
1.	Check the Use Auto Complete to generate names for containers checkbox. The fields for Traditional Volumes, Aggregates, FlexVols, LUNs, and MetaLuns are enabled.
2.	Type in the base name you want Synergy to use when giving names for containers. Default names are given in each field, but you can change these names to whatever you want.
3.	Check the Use Numerical Suffix checkbox if you want a number value added to the end of the base name.
4.	Click Save All to save your changes.

13.4 Options – Network

The Options – Network tab gives you the option to have Synergy skip checking for the network user context. If you leave this checkbox unchecked disables specific Synergy functions. Contact Technical Support if you have questions about whether you should check this box.

13.5 Options – Localization

Although this feature is not currently implemented, in the future, you will be able to specify different languages (other than the default language of English (US)) that you want to be shown in Synergy.

13.6 Options – Formula Tweaks

Synergy allows you to designate the computational base you want used when performing analysis and calculations. There are two options you can select:

- Base 2 (NetApp)
- Base 10 (SNIA)

Selecting the green information icon gives you the formula Synergy uses when converting computations from Base 2 to Base 10. After reviewing this information, select whether you want to use Base 2 or Base 10 calculations, and click **Save All** to save your settings and close the wizard.

13.7 Options – Metrics

Synergy provides the ability for you to review the number of times you have launched Synergy. This can be helpful if you want to know how many times you have used Synergy for modeling and analysis. After reviewing this information, click **Save All** to close this wizard.

13.8 Options – Support

The **Options – Support** tab displays current registration information, application version, application context, and a request plugin license key field. Viewing this information gives you the most up-to-date information about your version of Synergy and allows you to request licenses for plugins you want to enable in your system.

You can also deactivate your copy of Synergy if you no longer plan to use Synergy and its features. To deactivate Synergy, simply click on the **Deactivate NetApp Synergy** icon in the Registration Information field.

To request a license for a plugin:

Step	Action
1.	Select the plugin you want to enable from the pull-down menu.
2.	Click the Request License icon. You must have an active Internet connection to request a license.
3.	Click Save All to request the license. An active license key is sent within 48 hours.

13.9 Options – License Keys

The **Options – Licenses** tab displays current licenses you have stored on your system. You can add, delete, and view existing license keys stored on your system from this tab.

To add a license to your system:

Step	Action
1.	Enter the License Key into the License Key field.
2.	Click Add License . The license key is validated.
3.	If the license key is valid, information about the license key is provided in the License Key Information pane. If the license key is invalid, an error message is displayed.

To delete an existing license:

Step	Action
1.	Select the license you want to delete from the list in the Locally Stored License Keys pane.
2.	Click the Delete License button to remove the license key from your system.
3.	Click Save All to save your settings and exit the screen.

13.10 Checking for Software Updates

To ensure that you are working with the latest version of Synergy on your system, it is highly recommended that you check for updates to your software on an occasional basis. This enables you to verify that you have all current patches, bug fixes, and other updates.

To check for software updates, perform the following tasks:

Step	Action
1.	Select Check for Software Updates from the Tools menu in the Command Bar menu.
2.	Click the Check for Updates icon. The Synergy Update page appears.
3.	Click Next to continue. Synergy then checks for any software updates.
4.	If your current version of Synergy is up to date, a confirmation screen is shown telling you that you have the most recent update.
5.	Click Close to exit the wizard.

13.11 Attempting NetApp Partner Center Authentication

NetApp Synergy provides a separate login portal for NetApp partners who want to access the latest information on Synergy. If you want to log into the NetApp Partner Center and access Partner Center information, follow these steps:

Step	Action
1.	Select Attempt NetApp Partner Center Authentication from the Tools menu in the Command Bar menu. The Partner Center Authentication page is displayed.
2.	Enter your username and password and click the Login link to have your credentials validated.
3.	You can also retrieve your password if you have forgotten it by clicking on the Click Here link next to Forgot your password? .
4.	You can also sign up for a Partner Center account by clicking the Sign up Now! link next to Not registered? .

13.12 Attempting to Reset User Context

You can also reset your context settings by selecting the **Attempt Reset User Context** from the Command Bar menu. Valid context settings are:

- **Internal** – Intranet detected
- **Partner** – authenticated to Partner Center
- **Other** - unknown

14 Document Information

The following represents information about this document and includes review and approval, version control and history, references, and a glossary of terms.

14.1 Review and Approval

14.1.1 Reviewers List

Table 1 - Document Reviewers Information.

Date	Name	Title

14.1.2 Approval List

Table 2 - Document Approval Information.

Name	Role Title
Signature and Date:	
Signature and Date:	
Signature and Date:	

14.2 Contact and Document Control Information

14.2.1 Contact Information

Table 3 - Customer and NetApp contact information.

Contact Details			
Customer Details			
Company Name			
Address			
Project Code			
Contact name	Title	Telephone	Email
Network Appliance Details			
Address			
Contact Name	Title	Telephone	Email

14.2.2 Document Version Control

Table 4 - Document version information.

Date	Version	Description	Author	Reviewer
09/05/08	1.0	Initial Release	Thomas Richards	

14.3 References

This section contains documents and reference materials used to develop this document.

Table 5 - References.

References	Title
<enter website or document name>	<enter title and location of reference material>

14.4 Definitions

This section details the glossary of terms used throughout this document.

Table 6 - Glossary of terms.

Term	Definition
CIFS	Common Internet File Service
DNS	Domain Name System
DR	Disaster Recovery
DRC	Disaster Recovery Center (data center)
FAS	Fabric Attached Storage
FC	Fibre Channel
FlexVol	Flexible volume
IOPS	Input/Output Operations per Second
iSCSI	Internet Protocol – Small Computer Systems Interface
MAN	Managed / Metro Area Network
LUN	Logical Unit Number
NAS	Network Attached Storage
NFS	Network File System
NIS	Network Information Service
NTP	Network Time Protocol
PDU	Power Distribution Units
PDC	Primary Data Center
RPM	Rotations Per Minute
RAID	Redundant Array of Independent Disks
SAN	Storage Area Network
SNMP	Simple Network Management Protocol
SATA	Serial Advanced Technology Attachment
UPS	Uninterruptible Power Supply
VIF	Virtual interface
VLAN	Virtual Local Area Network
WINS	Windows Internet Naming Service

15 Appendices

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