



## **Deploying Silver Peak Velocity with Dell Compellent Remote Instant Replay**

November 2012

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## Formatting Conventions

- *Italic font* – used for words that require special attention or as a placeholder for information that must be user supplied.
- Monospaced font – Command names and information displayed on a system console. Also used for file, path and directory names.
- **Bold monospaced font** – Words and characters that the user must type. Typed characters are always in lowercase letters, unless the program is case-sensitive.

## Prerequisites

- Download Silver Peak Velocity OVA file
- Silver Peak Velocity licenses
- IP address information for appendix A
- A configured and working VMware environment
- Read this entire document before beginning configuration

## Overview

This document describes the configuration of Silver Peak Velocity appliances for Dell Compellent Remote Instant Replay deployments using iSCSI over Ethernet.

For this deployment, the Silver Peak Velocity appliance will act as the next-hop for the Remote Instant Replay traffic. The iSCSI adapter(s) used for replication on the Compellent arrays will use the Velocity appliance as the default gateway. The Velocity appliance will optimize the Remote Instant Replay traffic and then forward it across the WAN to the remote site.

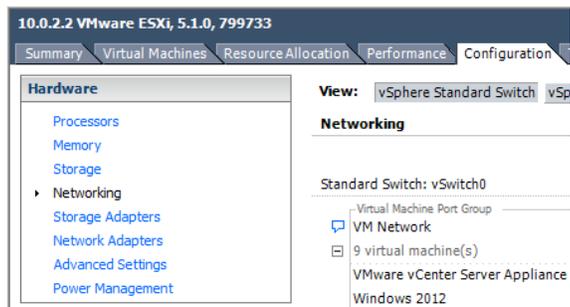
Note that while this document only shows one side of the configuration, the remote site must have all of the reciprocal settings configured.

## VMware Configuration

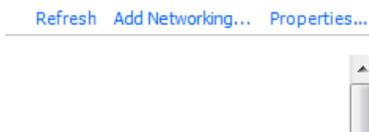
### THESE STEPS MUST BE COMPLETED AT THE PRIMARY AND DR SITES

To begin, a new switch must be created in VMware for interfaces that won't be used by the Silver Peak Velocity appliance. The Velocity appliance has four interfaces, mgmt0, mgmt1, LAN0 and WAN0. For this deployment only the mgmt0 and WAN0 interfaces will be used. The remaining interfaces must be mapped to a vSwitch that is not connected to any LAN.

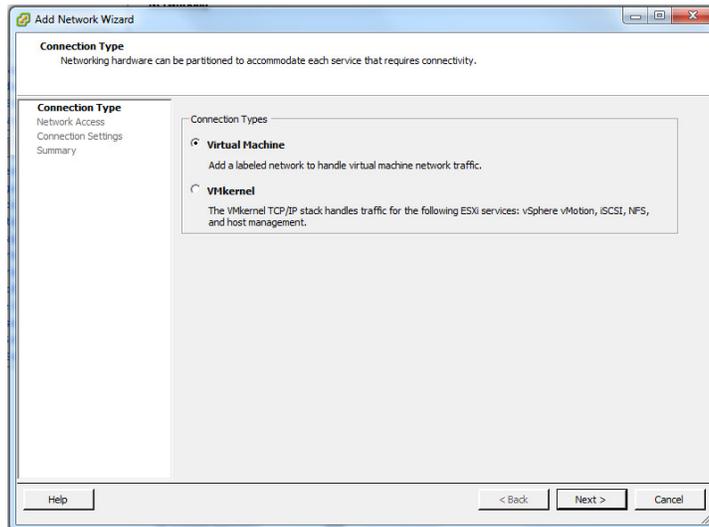
1. Open the vSphere client and select the server where the Silver Peak Velocity appliance will be deployed.
2. Select the configuration tab and click on Networking.



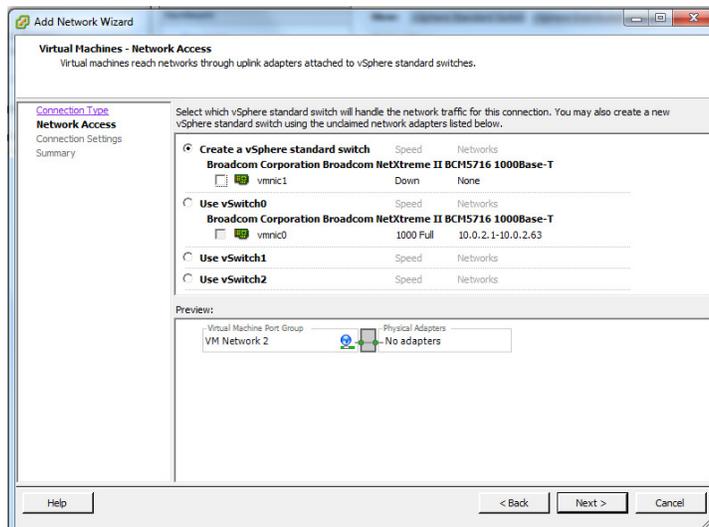
3. Select Add Networking.



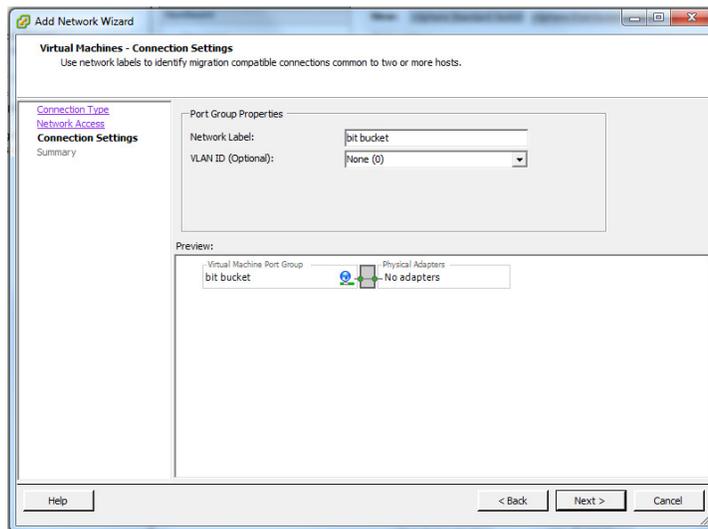
4. Add a Virtual Machine network and click Next>.



5. By default the vSphere client will select a physical NIC to connect the switch to a LAN. Because we are not using the virtual interfaces from the Velocity appliance that will be connected to the switch, the physical NIC should be unchecked. With the physical NIC unchecked this switch will be isolated and not connected to a LAN.



6. Give the new virtual switch a name and click next.

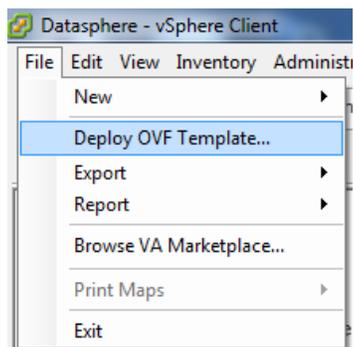


7. Click finish and the switch will be created.

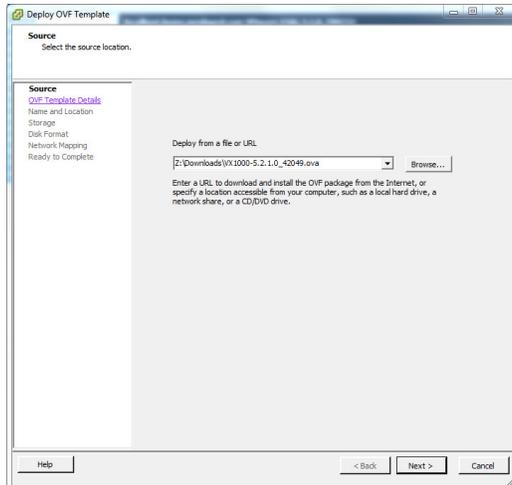
## Deploying the Silver Peak Velocity Virtual Machine

**These steps must be completed at the primary and DR sites**

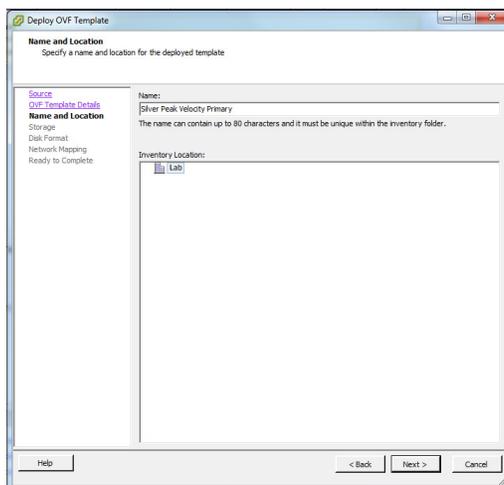
8. To deploy the Velocity appliance open the vSphere client and select the server where the VM will be deployed.
9. In the vSphere client click File->Deploy OVF Template.



10. Browse to the location where the Velocity appliance has been downloaded.
  - a. Select the Velocity OVF and click Open.
  - b. Click Next >.

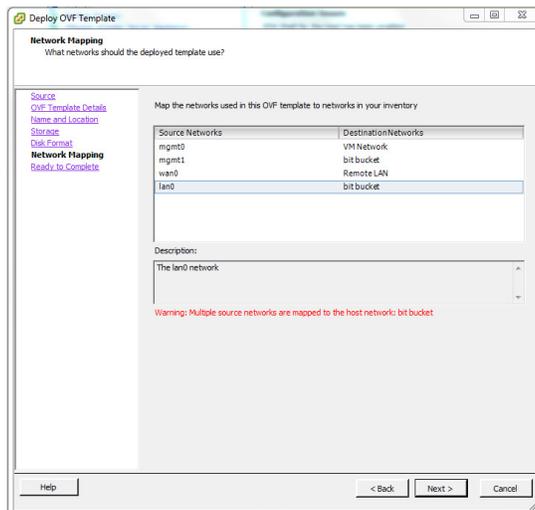


11. Give the virtual machine a meaningful name and click Next >.

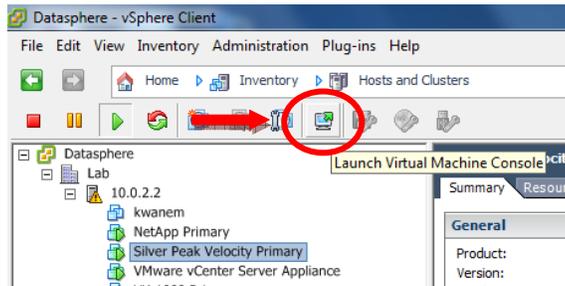


12. Select an available datastore for the Velocity appliance.
  - a. The data store that houses the Velocity appliance should not be replicated and optimized by the Velocity appliance. If the data store with the Velocity virtual machine is replicated, and optimized by the Velocity appliance, there is the potential for IO constraint as this is recursive optimization. With recursive optimization data that is being optimized is read from disk, deduplicated and written back to the same disk. The Velocity appliance will not recognize the data as being a duplicate because it stores all data encrypted on disk.
  - b. Be sure to use a data store that has sufficient performance.

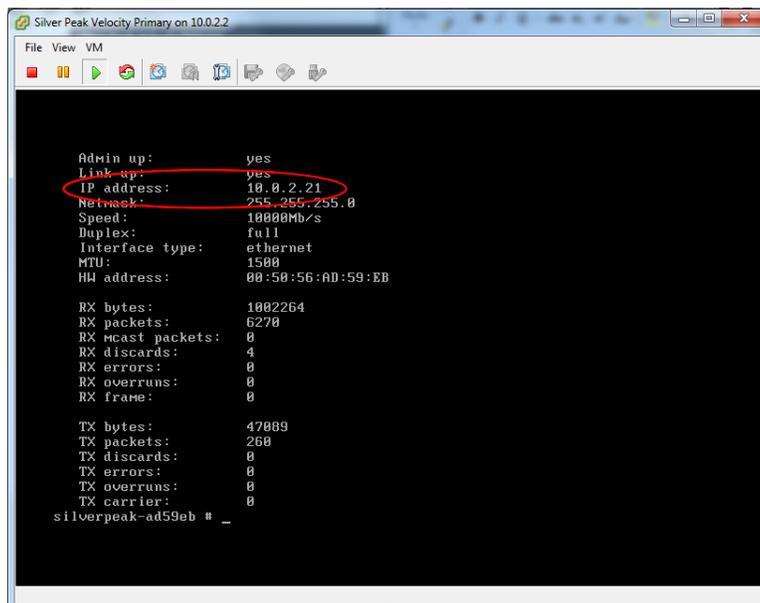
13. Select Thick Provision Eager Zeroed.
14. When mapping network interfaces, only two of the available Source Networks will be used. Mgmt0 and wan0 should be mapped to the production network. If a management only network exists, map mgmt0 to a destination network that is connected to this network. Wan0 must be mapped to a destination network that is physically connected to the production network. Connect mgmt1 and lan0 to the network that was created earlier in step 6.



15. Select Power on after deployment and click Finish.
16. Wait for the VM to be deployed and powered on.
17. When the Velocity VM has been deployed and powered on select it and launch a console connection.



18. Click in the console window and press Enter.
19. To login use the default username and password admin/admin.
20. Type `show interfaces mgmt0` at the command line.
21. Note the IP Address for mgmt0. We will use this address to connect to the GUI and continue configuration.



22. Close the console window and open a web browser.
23. Type the ip address of the mgmt0 port on the Velocity appliance into the web browser and press enter.



## Initial Silver Peak Configuration

These steps must be completed at the primary and DR sites

1. Login and begin with the Silver Peak configuration wizard. The default user name and password is admin/admin.
2. Click Next> to begin the Configuration Wizard.
3. Assign the appliance hostname. If a static management IP address is required it can be assigned here.
  - a. Uncheck the box for Auto Tunnel. For this deployment the tunnels will be manually created.

The screenshot shows the 'Configure Appliance Management Settings' screen. At the top, there are three numbered steps: 1. Configure Appliance Management Settings (highlighted), 2. Set Deployment Mode (Edge-On/Line or Router/Out-of-Path), and 3. Configure Appliance Data Path Interfaces. The main form area is titled 'Configure Appliance Management Settings' and includes the following fields and options:

- Appliance Name: Hostname:
- Management Interface (mgmt0):
  - Speed/Duplex:
  - DHCP
  - Static
    - IP Address / Netmask:  /
    - NW4-Hop IP Address:
    - DNS Server:  (optional)
- Auto Tunnel:  (Create tunnels automatically to other Silver Peak appliance in network)

At the bottom, there are links for 'Quick Start Guide' and 'User Manual', and navigation buttons: '< Back', 'Next >', and 'Skip Wizard'.

4. Set the date, time and optionally change the management password. The license key must also be entered during this step. The license key is included in the email that includes the download link for the Velocity appliance.

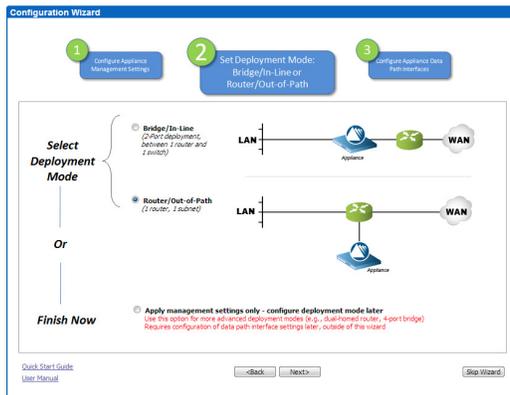
\*Note that there is a different license key required for each Velocity appliance.

The screenshot shows the 'Configure Appliance Management Settings, Continued' screen. At the top, the same three numbered steps are visible. The main form area is titled 'Configure Appliance Management Settings, Continued' and includes the following fields and options:

- Date/Time:
  - Time Zone:
  - Manual
    - Date:  (YYYY/MM/DD)
    - Time:  (HH:MM:SS)
  - NTP Time Synchronization
    - Server 1:
    - Server 2:
- Change Admin Password (optional):
  - Old:
  - New:
  - Confirm:
- License:   
Retrieve your appliance license key from the Silver Peak Support Portal and paste it here

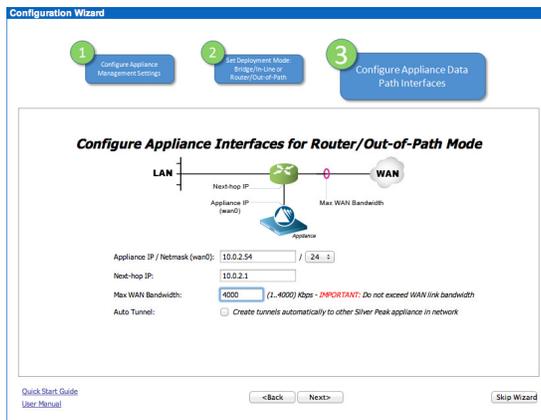
At the bottom, there are links for 'Quick Start Guide' and 'User Manual', and navigation buttons: '< Back', 'Next >', and 'Skip Wizard'.

5. Select Router/Out-of-Path mode and click Next>.



6. Assign the appliance IP address, next-hop IP address (typically the WAN router/default gateway) and set the max bandwidth. The max bandwidth will control how much bandwidth the Silver Peak Velocity appliance uses for replication across the WAN. The appliance IP address will also be the WAN0 IP address.

\*note that the Silver Peak Velocity Appliance and the Compellent iSCSI interface need to be on the same subnet and on the same switch if possible.



7. Verify the configuration, click apply, and wait for the system to reboot.



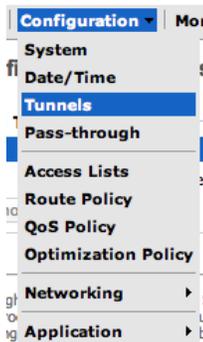
## Configuring Silver Peak Velocity

These steps must be completed at the primary and DR sites

8. When the appliance is finished rebooting, enter the username and password and click login.



9. Create a manual tunnel between the Silver Peak Velocity appliances.
  - a. Select Configuration>Tunnels



- b. Select Add and use the following settings:
      - Name: use a name to describe this tunnel, for example *tunnel-to-remote-site*
      - Admin: up
      - MTU: 1500
      - Local IP: the local system IP address (this will be filled in already)
      - Remote IP: the remote Velocity appliance system IP address.
      - Auto Max BW: checked. Max BW can be set if replication traffic needs to be limited to a specific throughput.
      - Min BW: 32
      - Mode: GRE

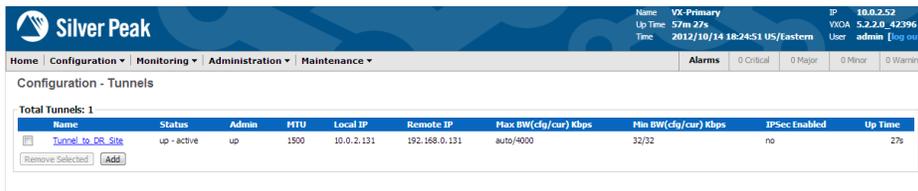
\*UDP and IPSEC are additional options for the tunnel mode. If IPSEC is chosen all traffic between the Silver Peak Velocity appliances will be encrypted.

- c. After entering the tunnel information the tunnel state will be down - in progress.

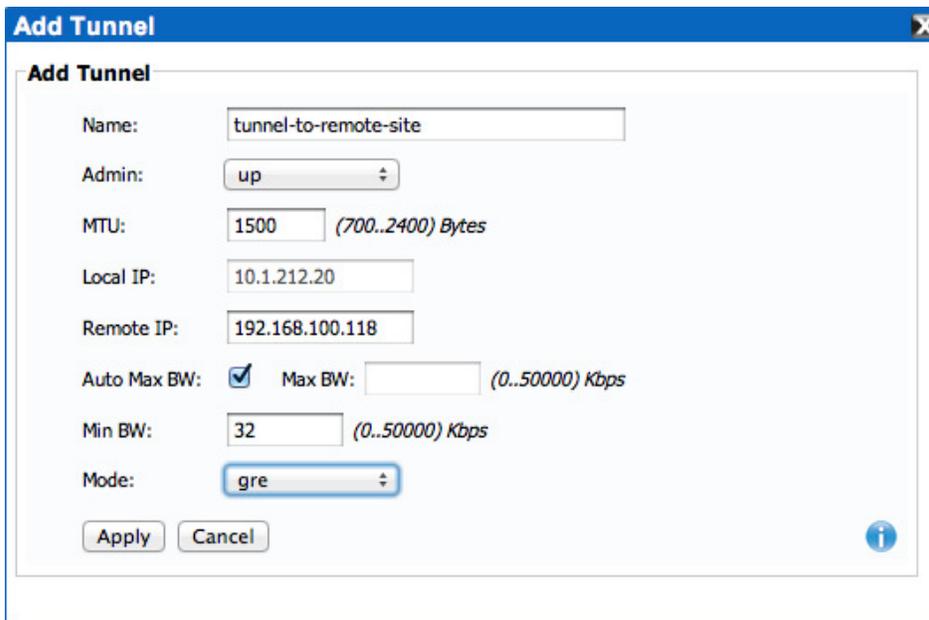
**Status**

down - in progress

- d. When the tunnel has been successfully configured at the primary and secondary site the status will be changed to up – active.



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 By using this product, you agree to be bound by the terms of Silver Peak Systems Inc. End User License Agreement.



**Add Tunnel**

Name:

Admin:

MTU:  (700..2400) Bytes

Local IP:

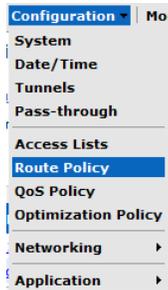
Remote IP:

Auto Max BW:  Max BW:  (0..50000) Kbps

Min BW:  (0..50000) Kbps

Mode:

10. Create a Route Policy for iSCSI.
  - a. Select Configuration->Route Policy



- b. Select Add and use the following settings:

Priority: 10

Protocol: ip

Src Subnet: *the local subnet where the Silver Peak Velocity appliance and the Compellent array are*

Tunnel: *use the tunnel that was created in step 9.*

Tunnel Down Action: Drop

\*note that the Src and Dst subnet information will be reversed when configuring the remote Velocity appliance.

Priority	ACL	Match Criteria					Set Actions		
		Protocol	Src Subnet	Dst Subnet	Application	Src:Dst Port	DSCP	Tunnel	Tunnel Down Action
<input type="checkbox"/> default								[auto optimized]	pass-through
new 10		ip	0.0.0.0/0	0.0.0.0/0	iscsi	0:0	any	Tunnel_To_DR_Site	drop

Apply Cancel

11. Click the red Save Changes button.

**Save Changes**

## Dell Compellent Configuration

### These steps must be completed at the primary and DR sites

The steps in this section of the deployment guide should not be performed until the Silver Peak Velocity appliances have been configured and the tunnel is listed as up.

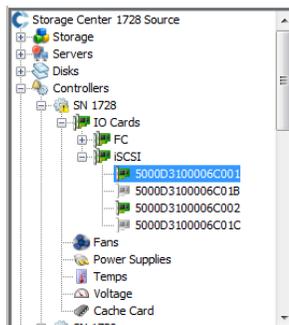
In order for the Velocity appliance to provide optimization, the Remote Instant Replay traffic needs to be directed to the Velocity appliance. The easiest way to direct the Remote Instant Replay traffic to the Velocity appliance is to change the default gateway on an iSCSI card or control port. If possible, dedicate an iSCSI card to Remote Instant Replay and change the default gateway on this card. Dedicating a card to Remote Instant Replay traffic allows replication traffic to be segmented and the card can be connected directly to the LAN, preferably to the same switch where the Velocity appliance is connected. If a single card cannot be dedicated then the default gateway on all iSCSI cards should be changed to the Velocity appliance.

Changing the default gateway to the Velocity appliance will not impact production iSCSI traffic that is on the local IP SAN. Best practices for iSCSI deployments have the initiators and target storage arrays on the same subnet, and typically on the same switch.

### Forwarding traffic to the Velocity appliance

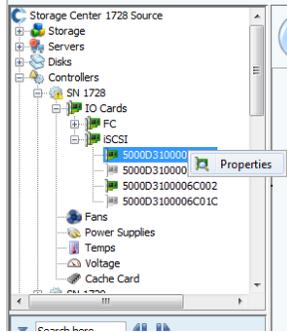
#### Default Gateway method Legacy Port

1. Log into Storage Center, expand Controllers, expand the controller used for replication, expand IO Cards, expand iSCSI and select the card used for replication.

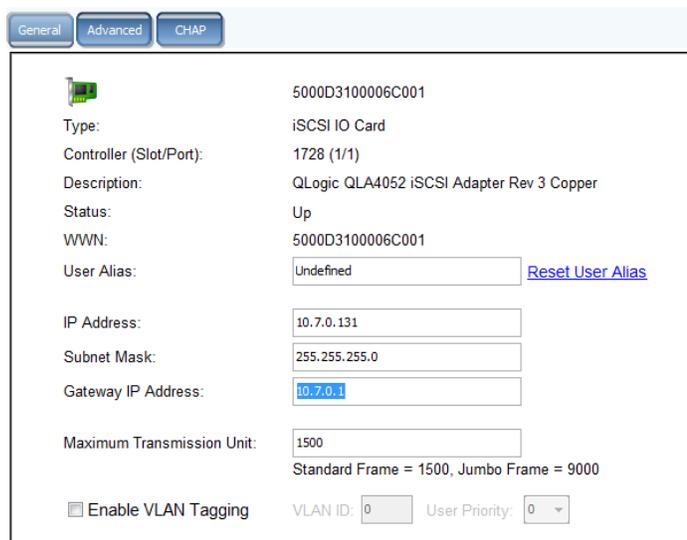


\*note that it is possible to have more than one controller performing replication. If both controllers are being used to replicate these changes must be made for each iSCSI card that is used for replication on each controller.

2. After selecting the iSCSI card in the system tree right click the card and select Properties.

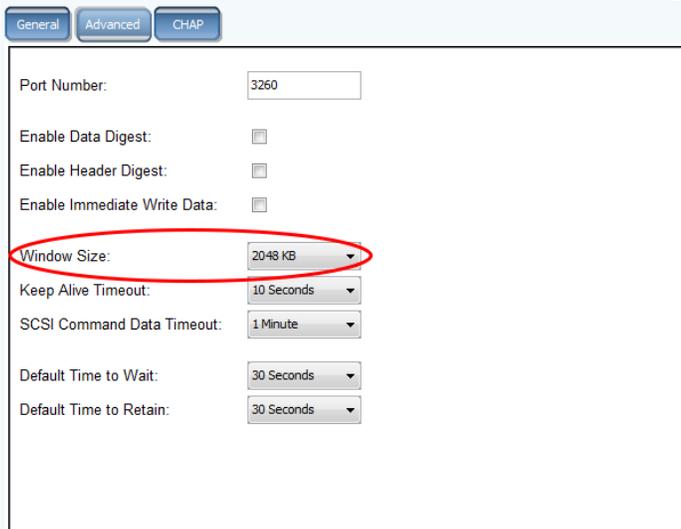


3. In the iSCSI IO Card Properties window change the Gateway IP Address to the appliance IP of the Velocity appliance and click OK.



General	
Type:	5000D3100006C001 iSCSI IO Card
Controller (Slot/Port):	1728 (1/1)
Description:	QLogic QLA4052 iSCSI Adapter Rev 3 Copper
Status:	Up
WWN:	5000D3100006C001
User Alias:	Undefined <a href="#">Reset User Alias</a>
IP Address:	10.7.0.131
Subnet Mask:	255.255.255.0
Gateway IP Address:	10.7.0.1
Maximum Transmission Unit:	1500 Standard Frame = 1500, Jumbo Frame = 9000
<input type="checkbox"/> Enable VLAN Tagging	VLAN ID: 0 User Priority: 0

4. Click the Advanced button to change the window size.
5. Select the maximum value from the Window Size pulldown.



Advanced	
Port Number:	3260
<input type="checkbox"/> Enable Data Digest:	
<input type="checkbox"/> Enable Header Digest:	
<input type="checkbox"/> Enable Immediate Write Data:	
Window Size:	2048 KB
Keep Alive Timeout:	10 Seconds
SCSI Command Data Timeout:	1 Minute
Default Time to Wait:	30 Seconds
Default Time to Retain:	30 Seconds

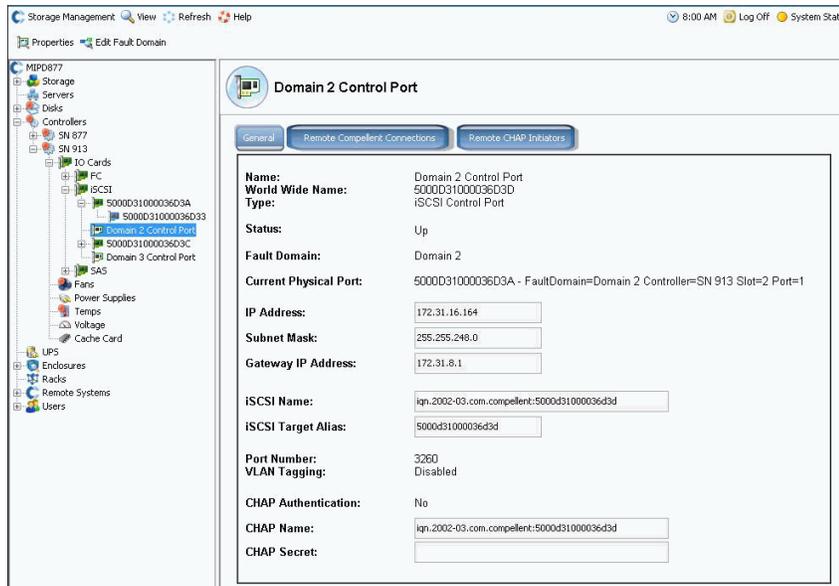


6. Click OK.

## Default Gateway method when using virtual port mode

If virtual port mode is used, the default gateway for the Fault Domain must be changed to the Velocity appliance IP address.

1. Select the iSCSI control port from the system tree in Storage Center Manager.



2. Select Edit Fault Domain from the shortcut menu.
3. In the Fault Domain Properties window select IP Settings.
4. Change the Gateway to the appliance IP address of the Velocity appliance.
5. Click OK.

## Changing QoS Definitions on the Compellent Array

The Silver Peak Velocity appliance provides optimization to the Remote Instant Replay traffic across the WAN, including data reduction. In order to provide the highest throughput, and highest level of reduction, any QoS definitions in the Compellent array need to be set to 1 Gbps. Redefining the QoS definition will allow the Velocity appliance to manage the bandwidth across the WAN more efficiently.

1. Select QoS Definitions in the system tree.
2. Select the QoS Definition that is being used for replication in the system tree.
3. Click Properties on the QoS shortcut menu.
4. Change Link Speed to 1 GB – 1 gigabits per second and click OK.
5. QoS needs to be applied to any volume that already has a QoS defined. A new QoS can be defined and set to 1 Gb and used as the default value for any new QoS policies.



## Links

Silver Peak Documentation: [http://silver-peak.com/Support/user\\_docs.asp](http://silver-peak.com/Support/user_docs.asp)

Dell Compellent Documentation: <http://support.dell.com/>

## Appendix A

### Configuration Sheet

Local Site	Remote Site
Silver Peak mgmt0:	Silver Peak mgmt0:
Replication Bandwidth:	Replication Bandwidth:
Silver Peak Appliance IP	Silver Peak Appliance IP
Appliance IP(also wan0):	Appliance IP(also wan0):
Appliance Subnet Mask:	Appliance Subnet Mask:
WAN0 Next-hop:	WAN0 Next-hop:
Compellent Primary	Compellent Remote
iSCSI IP Address:	iSCSI IP Address:

