

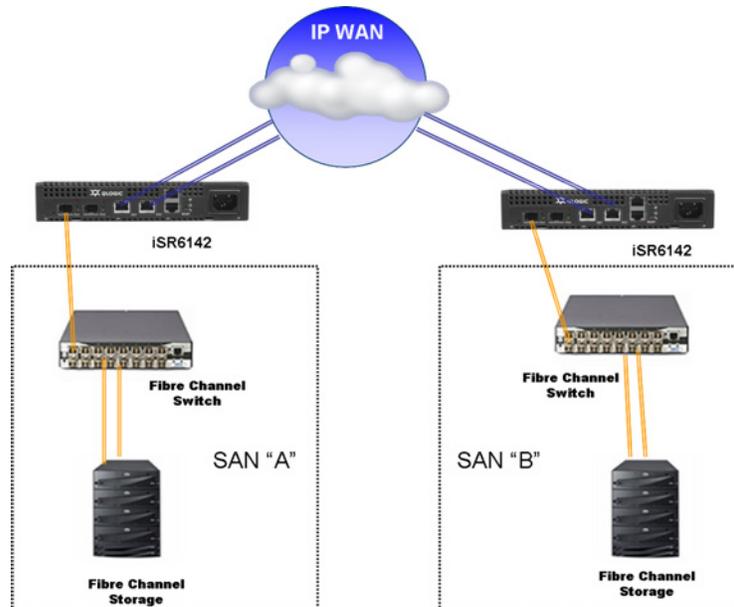
# Applications Note

## Using the SANbox 6142 with EMC MirrorView™ and SAN Copy™

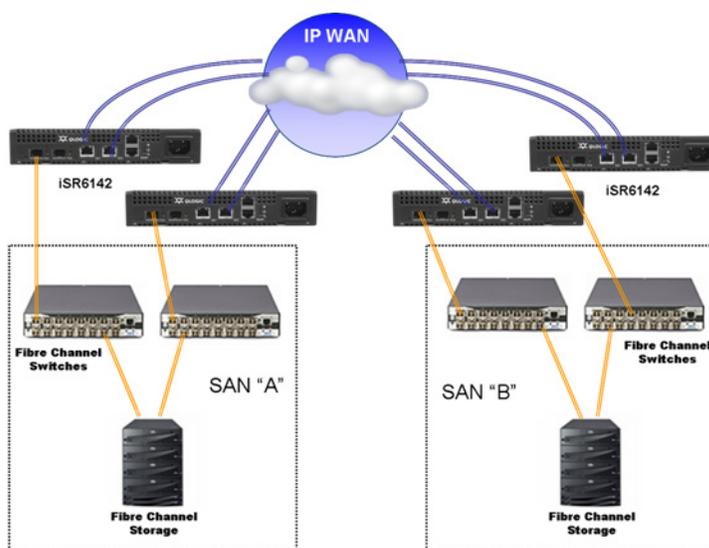
*Products Affected*

Product Name	Part Number
SANbox 6142	ISR6142-E-SP

This applications note provides step-by-step instructions on how to install and configure the SANbox 6142 router for use with EMC MirrorView and SAN Copy production environments. Figures 1 and 2 show two recommended configurations. Other configurations are possible, such as a single SANbox 6142 connected via two Fibre Channel (FC) switches on each storage area network (SAN).



**Figure 1. Single Gateway Topology**



**Figure 2. High Availability Gateway Topology**

1. Gather the following information required to configure the SANbox 6142 routers (review the topology diagrams in this document):
  - a. Local router management port:
    - IP Address \_\_\_\_\_
    - Subnet mask \_\_\_\_\_
    - Gateway \_\_\_\_\_
  - b. Remote router management port:
    - IP Address \_\_\_\_\_
    - Subnet Mask \_\_\_\_\_
    - Gateway \_\_\_\_\_
  - c. Local router GigE ports to be used in Fibre Channel over IP (FCIP) connections:
    - GE1 IP Address \_\_\_\_\_
    - GE1 Subnet Mask \_\_\_\_\_
    - GE1 Gateway \_\_\_\_\_
    - GE2 IP Address \_\_\_\_\_
    - GE2 Subnet Mask \_\_\_\_\_
    - GE2 Gateway \_\_\_\_\_
  - d. Remote router GigE ports to be used in FCIP connections:
    - GE1 IP Address \_\_\_\_\_
    - GE1 Subnet Mask \_\_\_\_\_
    - GE1 Gateway \_\_\_\_\_
    - GE2 IP address \_\_\_\_\_
    - GE2 Subnet Mask \_\_\_\_\_
    - GE2 Gateway \_\_\_\_\_
2. Install the SANsurfer router management software on your workstation.

3. Configure the routers:
  - a. Set up the management IP address.
  - b. Set the time and date.
  - c. If a SmartWrite™ license is available, enable it by typing in the key.
4. Set the iSCSI port parameters:
  - a. IP address
  - b. Subnet mask
  - c. Gateway IP address
  - d. If the iSCSI ports are connected through the Ethernet switch, select the link switch and SANbox 6142 link settings from a single row of [table 1](#). However, if the SANbox 6142's iSCSI ports are connected directly to a server or storage device, ensure that the duplex and link-rate of the peers are the same settings.

**Table 1. Link Rates**

<b>6142 iSCSI Port Duplex – Link Rate</b>	<b>Ethernet Switch Connected Port Duplex – Link Rate</b>
Auto – Auto	Auto – Auto
Full – Auto	Full – Auto
Full – 10	Full – 10
Full – 100	Full – 100
Full – 1000	Full – 1000

**NOTE:** The SANbox 6142 iSCSI port and Ethernet switch port should have matching link rate and duplex mode settings as specified in [table 1](#). If the link-rate and duplex mode are not set as specified in [table 1](#), the system may experience a loss of connectivity.

5. Add remote peers:
  - a. Ensure that the management ports on both routers can communicate with each other by pinging the respective management ports. Type the *ping* command in the command line interface (CLI) (see [figure 3](#)), or use the SANsurfer GUI (see [figure 4](#)).

```

QRouter (admin) #> ping

A list of attributes with formatting and current values will follow.
Enter a new value or simply press the ENTER key to accept the current value.
If you wish to terminate this process before reaching the end of the list press
'q' or 'Q' and the ENTER key to do so.

IP Address [0.0.0.0] 172.17.136.130
Iteration Count (Min=1, Max=10) [10      ] 3
Outbound Port (0=Mgmt, 1=GE1, 2=GE2) [Mgmt  ] 0

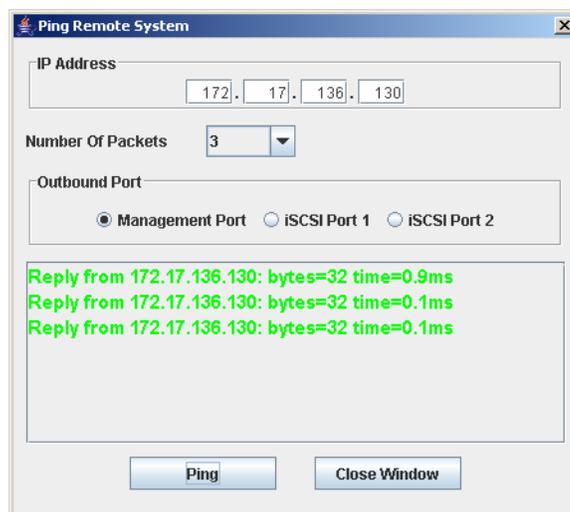
Pinging 172.17.137.130 with 32 bytes of data:

Reply from 172.17.137.130: bytes=32 time=0.2ms
Reply from 172.17.137.130: bytes=32 time=0.1ms
Reply from 172.17.137.130: bytes=32 time=0.1ms

Ping Statistics for 172.17.137.130:
Packets:  Sent   = 3, Received = 3, Lost   = 0
Approximate round trip times in milli-seconds:
Minimum = 0.1ms, Maximum = 0.2ms, Average = 0.1ms

```

**Figure 3. Ping with CLI**



**Figure 4. Ping with SANsurfer GUI**

- b. Use the *remotepeer add* command in CLI (see figure 5) or the SANsurfer GUI Add Remote Router Wizard (see figure 6) to add the remote peer. You will need to enter the remote peer's management port IP address and the admin password.

```

QRouter (admin) #> remotepeer add

A list of attributes with formatting and current values will follow.
Enter a new value or simply press the ENTER key to accept the current value.
If you wish to terminate this process before reaching the end of the list press
'q' or 'Q' and the ENTER key to do so.

REMOTE MGMT port IP Address          [0.0.0.0] 172.17.136.130
Contacting REMOTE system (timeout=120 seconds) ...

<Admin> password of REMOTE system: *****
<Admin> password confirmed.

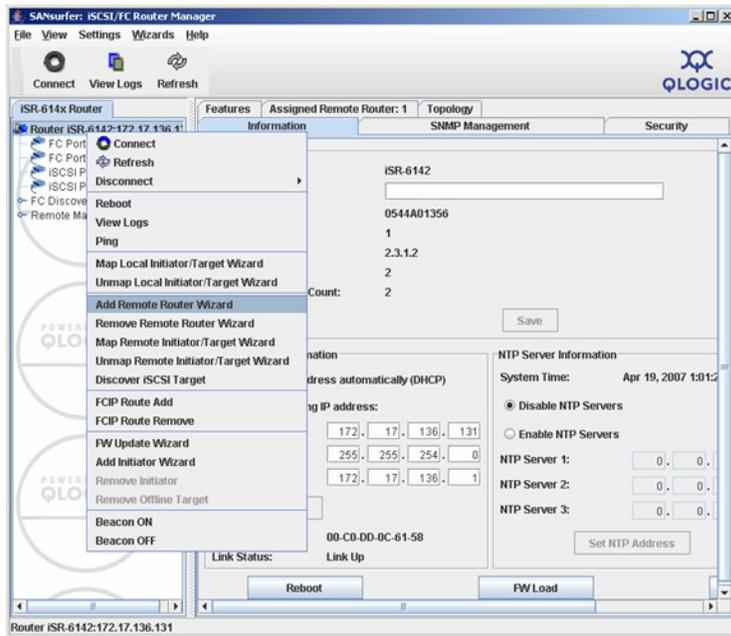
Remote System Information
-----
Product Name           iSR-6142
Symbolic Name
Serial Number          0544A00538
HW Version             3
SW Version             2.3.1.2
No. of iSCSI Ports     2
iSCSI Base Name       iqn.2004-08.com.qlogic:isr-6142.0544a00538
Mgmt IP Address        172.17.136.130
iSCSI Port 1 IP Address 10.3.5.100
iSCSI Port 1 TCP Port No. 3260
iSCSI Port 2 IP Address 10.3.5.101
iSCSI Port 2 TCP Port No. 3260

Do you wish to create a connection with the REMOTE system (y/n): y

All attribute values for that have been changed will now be saved.

```

**Figure 5. Remotepeer add with CLI**



**Figure 6. Add Remote Router Wizard with SANsurfer GUI**

- c. Validate that the operation is successful by typing the `show remotepers` command in CLI (see figure 7), or by refreshing the SANsurfer GUI.

```

QRouter (admin) #> show remotepers

Remote System Information
-----
Product Name           isr-6142
Symbolic Name          0544A00538
Serial Number          0544A00538
HW Version              3
SW Version              2.3.1.2
No. of iSCSI Ports     2
iSCSI Base Name        iqn.2004-08.com.qlogic:isr-6142.0544A00538
Mgmt IP Address        172.17.136.130
iSCSI Port 1 IP Address 10.3.5.100
iSCSI Port 1 TCP Port No. 3260
iSCSI Port 2 IP Address 10.3.5.101
iSCSI Port 2 TCP Port No. 3260
    
```

**Figure 7. Show remotepers with CLI**

6. Ensure that the local SANbox 6142 and the remote SANbox 6142 iSCSI ports can communicate with each other. Use the *ping* command as explained in [step 5](#). In this case, ping one of the remote peer SANbox 6142 iSCSI ports by entering the remote IP address. Select either iSCSI port 1 or iSCSI port 2 of the local SANbox 6142 as the outbound port interface. See figures [8](#) and [9](#).

```

QRouter (admin) #> ping

A list of attributes with formatting and current values will follow.
Enter a new value or simply press the ENTER key to accept the current value.
If you wish to terminate this process before reaching the end of the list
press 'q' or 'Q' and the ENTER key to do so.

IP Address [0.0.0.0] 10.3.5.101
Iteration Count (Min=1, Max=10) [10 ] 3
Outbound Port (0=Mgmt, 1=GE1, 2=GE2) [Mgmt ] 1

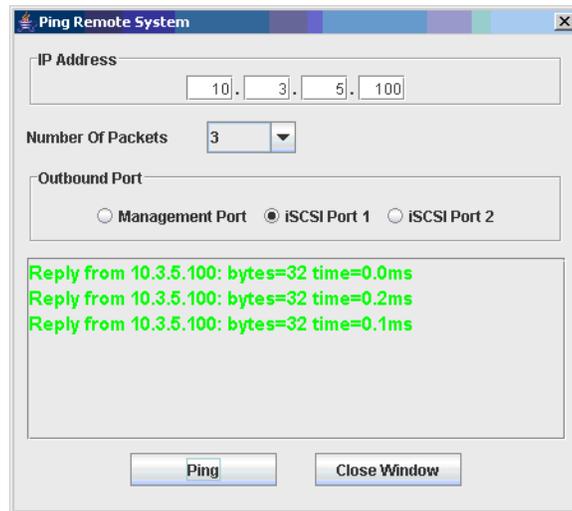
Pinging 10.3.4.101 with 32 bytes of data:

Reply from 10.3.5.101: bytes=32 time=0.2ms
Reply from 10.3.5.101: bytes=32 time=0.1ms
Reply from 10.3.5.101: bytes=32 time=0.1ms

Ping Statistics for 172.17.137.130:
Packets: Sent = 3, Received = 3, Lost = 0
Approximate round trip times in milli-seconds:
Minimum = 0.1ms, Maximum = 0.2ms, Average = 0.1ms

```

**Figure 8. Ping with CLI**



**Figure 9. Ping with SANSurfer GUI**

- 
7. Connect the EMC arrays and the SANbox 6142 through the FC switch:
    - a. Ensure that the FC switch port to which the SANbox 6142 FC port is connected can operate in *loop mode* (usually denoted by FL or GL).
    - b. Ensure that the SANbox 6142's FC port status is *up*. Type the *show fc* command in CLI to verify that the link is *up*.
    - c. If the EMC array is not connected to the FC switch, connect the EMC array FC ports to the FC switch. Make sure that you connect the ports that are used for MirrorView (usually port 1 on each storage processor (SP)).
    - d. Ensure that *RSCN Suppression* is set to *Disabled* for any FC switch port connected to or zoned with a SANbox 6142 port. (*Auto* is not an acceptable setting.)
  8. Create zones in the FC switches:
    - a. Configure the EMC array storage processor A (SPA) ports and a SANbox 6142 port in one zone.
    - b. Configure the EMC array storage processor B (SPB) ports and a SANbox 6142 port in another zone.
    - c. Check the discovered targets through either CLI or the SANsurfer GUI. In CLI, type the *show targets* command. In the SANsurfer GUI, look through the target list; you should see the WWPNs of the SP ports for which you created zones.
    - d. Repeat [step 8](#) for the remote peer SANbox 6142 and the remote EMC array.

9. Create remote mappings for storage processor WWPNs:

- a. Type the *remotemap add* command in CLI or use the SANsurfer GUI Map Remote Initiator/Target Wizard. Generally, you want to map SPA to SPA and SPB to SPB.

The *remotemap add* command causes the router to present additional ports on its Fibre Channel interface. These additional ports are referred to as virtual ports (VPs).

```

QRouter (admin) #> remotemap add

The following wizard will create a mapping a device connected to the
local system and a device connected to the selected remote peer system.
If you wish to terminate this wizard before reaching the end of the list
press 'q' or 'Q' and the ENTER key to do so.

Index      (System Info, Mgmt IP Address)
-----
0          iSR-6142.0544A00538(172.17.136.130)

Please select a REMOTE system from the list above ('q' to quit): 0

Index      (WWNN,WWPN/iSCSI Name)
-----
0          50:06:01:60:b0:22:13:ea,50:06:01:61:30:22:13:ea (Init/Tgt)
1          50:06:01:60:b0:22:13:ea,50:06:01:69:30:22:13:ea (Init/Tgt)

Please select a LOCAL device from the list above ('q' to quit): 0

Index      (WWNN,WWPN/iSCSI Name)
-----
0          50:06:01:60:b0:22:0c:d1,50:06:01:61:30:22:0c:d1 (Init/Tgt)
1          50:06:01:60:b0:22:0c:d1,50:06:01:69:30:22:0c:d1 (Init/Tgt)

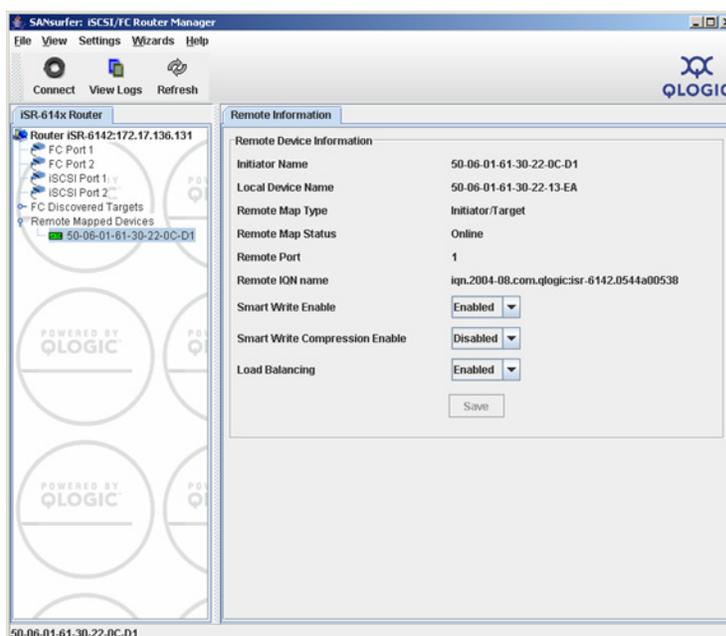
Please select a REMOTE device from the list above ('q' to quit): 0

Smart-Write (0=Enable, 1=Disable)           [Enabled   ]
Smart-Write Compression (0=Enable, 1=Disable) [Disabled  ]
Smart-Write Load Balance (0=Enable, 1=Disable) [Enabled   ]

All attribute values for that have been changed will now be saved.

```

**Figure 10. Remotemap add with CLI**



**Figure 11. Remote Add with SANsurfer GUI**

- b. After adding the remote mappings, verify that they are correct by typing the *show remotemaps* command in CLI, or refresh the SANsurfer GUI.

```

QRouter (admin) #> show remotemaps
Remote Mappings
-----
Local Device      50:06:01:60:b0:22:0c:d1,50:06:01:69:30:22:0c:d1
(Init/Tgt)
Remote Device     50:06:01:60:b0:22:13:ea,50:06:01:69:30:22:13:ea
(Init/Tgt)
Local Port        FC2
Remote Port       FC2
Remote System     iSR-6142.0544A01356(172.17.136.131)
Status            Online
Smart-Write       Enabled
Compression       Disabled
Load Balance      Enabled
Local Device      50:06:01:60:b0:22:0c:d1,50:06:01:61:30:22:0c:d1
(Init/Tgt)
Remote Device     50:06:01:60:b0:22:13:ea,50:06:01:61:30:22:13:ea
(Init/Tgt)
Local Port        FC1
Remote Port       FC1
Remote System     iSR-6142.0544A01356(172.17.136.131)
Status            Online
Smart-Write       Enabled
Compression       Disabled
Load Balance      Enabled
QRouter #>

```

**Figure 12. Show remotemaps with CLI**

- c. Check your local FC switch to verify that the WWPN of the remote EMC SP has logged into your local fabric.
- d. Always enable *SmartWrite* and *load balancing* if these options are supported by your equipment and infrastructure. See [step 12](#) for tips on when to turn on compression.

10. Create zones for the virtual ports (VPs) and the EMC array ports:
  - a. Add the newly created remote EMC array's SPA WWPN to the zone you created in [step 8](#), part [a](#).
  - b. Add the newly created remote EMC array's SPB WWPN to the zone you created in [step 8](#), part [b](#).
  - c. Make sure that the zones you create correlate with the remote mappings. Ensure that the remote SPA and the local SPA are in the same zone. Ensure that the remote SPB and the local SPB are in separate zones.
  - d. Repeat [step 10](#), parts [a](#) and [b](#), on the remote peer SANbox 6142 fabric.
  - e. When the new zones have been enabled on both fabrics, check the remote map status and verify that all are *online*. Type the `show remotemaps` command in CLI, or refresh the SANsurfer GUI. The remote maps should show *online* status within 30 seconds. If one or more zones are *offline*, then one part of the zoning process still needs to be completed or correctly configured. Go back and check the FC switch zoning and the remote maps to ensure that the zones match the remote mappings.
 

**NOTE:** The SANbox 6142 supports zoning by physical port number. Again, make sure that the correct SP ports are zoned to the correct SANbox 6142 ports.
11. Configure MirrorView between the two storage arrays. This can be done in exactly the same way as if both arrays were locally connected to the fabric. The VPs for the remote EMC array *have logged into the fabric locally*, so they appear to be local devices.
12. Configure the SANbox 6142s for optimum performance:
  - a. Configure the TCP window scaling factor:
 

As an initial value, set the TCP window scaling factor according to [table 2](#). (Type the `set iscsi` command in the CLI, or use the SANsurfer GUI.) For more information about setting the TCP window scale, see the *SANbox 6142 Intelligent Storage Router User's Guide* (FI0054601-00).

**Table 2. TCP Window Scale Factor**

Gig-E		100-T	
Latency	Window Scale	Latency	Window Scale
< 2.5 ms	3	< 2.5 ms	0
< 5 ms	4	< 5 ms	1
< 10 ms	5	< 10 ms	2
		< 20 ms	3
		< 40 ms	4
		< 80 ms	5

- b. Configure SmartWrite/load balance:
 

Type the `remotemap mod` command in CLI to enable SmartWrite and load balancing, if you have these feature licenses.
- c. Configure compression:
 

As a general rule, enable compression only if the sum of the IP links will handle less than 15 MBps of data. Compression is enabled with the `remotemap mod` command in CLI or with the SANsurfer GUI.

Figure 13 shows how the SANbox 6142 and two storage arrays are connected. The picture also lists the WWPNs and how they have to be zoned so that the local storage array and remote storage array can communicate with each other. The WWPN listed in red is the WWPN of VP, which is imported from the remote side.

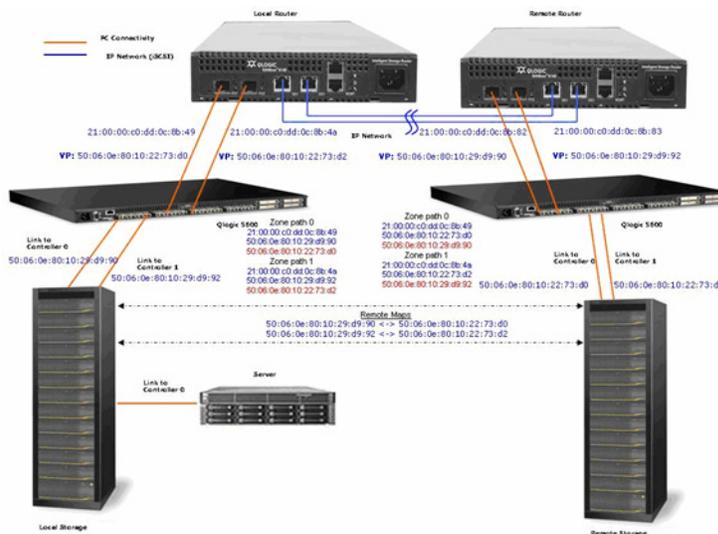


Figure 13. SANbox 6142 Connected to Two Storage Arrays

Document Revision History
Rev A, 5/18/07
Rev B, 5/31/07
Rev. B Change
Removed <i>CONFIDENTIAL</i> from footer.

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May 31, 2007