SPECTRA VERDE ARRAY FAMILY NETWORK SETUP TIPS

OVERVIEW

The Spectra® Verde® management port is separated from the data ports. The management port and data ports have their own default routes. This does not prevent a user from having the management and data ports utilizing the same network, if desired.

The basic steps for configuring the management and data ports for access to the network are simple and straight-forward. However, each network environment is unique and may require some additional troubleshooting in order to properly connect to the Verde, Verde DPE, or Verde DP array (collectively referred to as the *Verde array* or *array*) and utilize the 1 GigE or 10 GigE interfaces correctly.

Configuration

The first step is to configure the management and data ports using the Verde web interface, or the command line interface. Do not attempt to access the system directly and use the root console and modify interfaces. The management code is tightly integrated with the base operating system and other actions occur based on network changes.

Connectivity to the Network

The following configurations are supported for the data path:

Note: Spectra Logic recommends using 10 GigE network ports for data traffic.

Recommended:

- Single 10 GigE logical connection utilizing one of the 10 GigE physical ports

  —OR—

- Single 20 GigE logical connection utilizing two 10 GigE physical ports (link aggregation)

Not Recommended:

- Single gigabit logical connection utilizing one of the 10GBase-T physical ports and a Category 5 Ethernet cable

  —OR—

- Single 10 gigabit logical connection utilizing one of the 10GBase-T physical ports and a Category 6 Ethernet cable

Assign the appropriate IP address to the management and data ports either statically or using DHCP. If you are setting the MTU to something other than 1500, ensure that your switch configuration, as well as all the hosts on the network, supports larger MTU settings. The Verde master node can support jumbo frames (MTU=9000), but all switches and hosts on the network must be configured to support jumbo frames if this is selected, or performance might be degraded.

Link Aggregation Notes

Switches use different methods of routing traffic from hosts to NAS servers. There are also many different network configurations to move data from hosts to NAS servers. For example, some Cisco switches route traffic based on the MAC address and the IP address. The Verde arrays present only one MAC address and one IP address when the data ports are aggregated via DHCP. If static link aggregation is chosen, the arrays present only one MAC address, but can have up to 16 IP addresses aliased to the MAC address. It is up to the switch to rotate data transfers among the physical ports on the array in order to achieve the highest throughput possible.

For example, if only a single host is connected to the Verde array through a link aggregated connection, the measured performance is lower than the potential maximum transfer rate because only one physical port of the two port link aggregation is being utilized by the switch. If a single share is mounted two times using different IP addresses and transfers are started to that share from two separate hosts, the resulting throughput would be approximately twice that of a single host connection. You may have to configure more than two IP addresses on the array to force the switch hashing algorithm to utilize both physical ports and maximize performance.
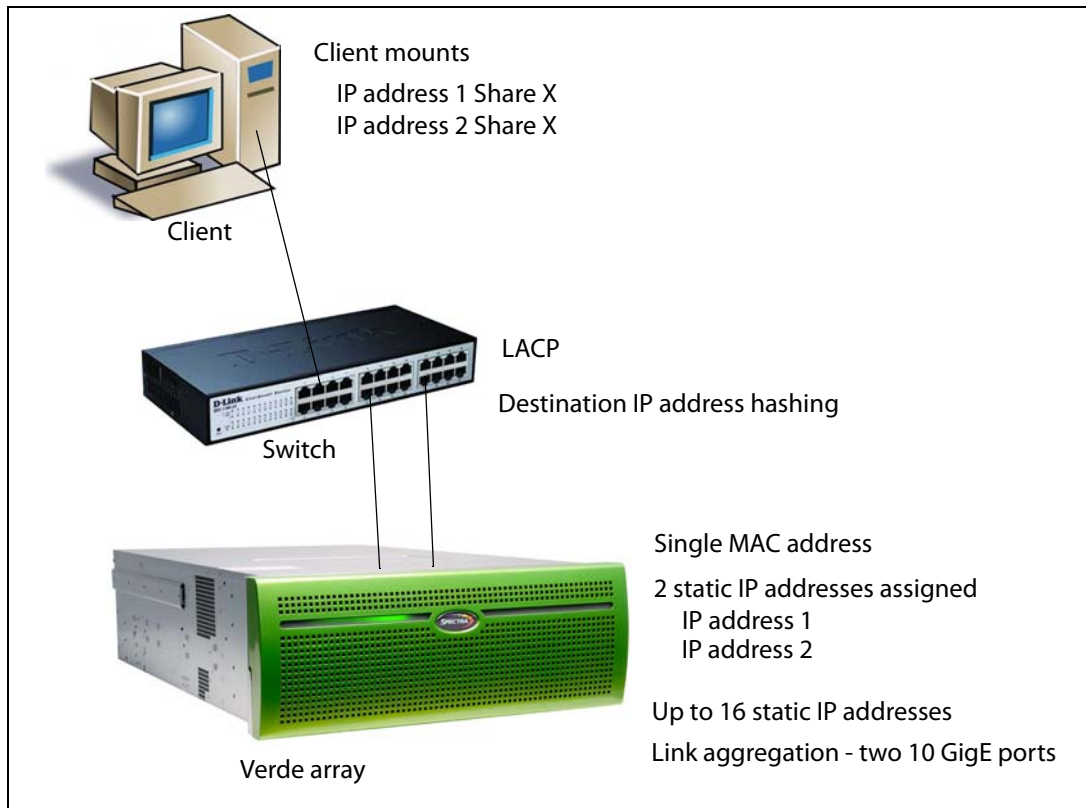

Figure 1 Connection example utilizing two IP addresses assigned to a single share.

Additionally, if link aggregation is configured for the Verde master node, then switches must also be able to support link aggregation to aggregate or "trunk" the data ports together to provide higher bandwidth into the Verde array. Switches must support link aggregation using LACP (Link Aggregation Control Protocol), and the switches must hash the destination IP addresses. Manually configure LACP on the switch ports. LACP does not get enabled automatically.

Once configured correctly and attached to the network, the status in the user interface indicates the speed of the connection and whether the port is active. The link lights on the network ports should be on and active at both the Verde master node and the network switch.

From your network, use the "ping" command (see Ping on page 3) to test the assigned IP address for the Verde management port or data port. If this is not successful, follow the troubleshooting tips below to ascertain if the problem is a network setup issue.

Troubleshooting

Port link LED Does Not Light

- Check the port configuration on the network switch. The Verde master node only supports auto-negotiation. Make sure the switch is configured to match speeds on both ends of the connection.

- Check the cables that connect the port to the other device. Make sure that they are connected. Verify that you are using the correct cable type and connectors. This is especially critical for 10 GigE connections utilizing SFPs.

- Verify that the switch ports are not administratively disabled. Consult the switch *User Guide* for more information.

Port link LED is Lit, But I Cannot Ping the Verde Array

- Check the LACP settings on the switch. If you are using link aggregation on the Verde array, the switch MUST be configured to use LACP on those ports. If you are not using link aggregation, the switch must be configured NOT to use LACP on those ports.

- Check the VLAN (Virtual Local Area Network) settings on the switch. Ensure that the ports are assigned to the correct VLAN.

Tools

Ping

The ping command is a simple tool, based on a request-response mechanism, to verify connectivity to a remote network node. The ping command is based on ICMP. The request is an ICMP Echo request packet and the reply is an ICMP Echo reply. Like a regular IP packet, an ICMP packet is forwarded, based on the intermediate routers' routing tables, until it reaches the destination. After it reaches the destination, the ICMP Echo reply packet is generated and returned to the originating node.

For example, to verify the connectivity from the switch to the IP address 192.168.2.10, run the command shown below from the switch command line or client:

```
ping 192.168.2.10
```

All ICMP Echo requests should receive replies including information about the round trip time it took to receive the response. 0 msec means that the time was less than 1 ms. If the request times out, then check the settings on the switch to which the Verde master node is connected.

Traceroute

You can use the traceroute command or something similar, if it is available, to not only verify connectivity to a remote network node, but to track the responses from intermediate nodes as well. The traceroute command sends a UDP packet to a port that is likely to not be used on a remote node with a TTL of 1. After the packet reaches the intermediate router, the TTL is decremented, and the ICMP time-exceeded message is sent back to the originating node, which increments the TTL to 2, and the process repeats. After the UDP packet reaches a destination host, an ICMP port-unreachable message is sent back to the sender. This action provides the sender with information about all intermediate routers on the way to the destination.

For example, the output of the command shown below,

```
traceroute 192.168.2.10
```

displays a numbered list indicating how many hops, on the way from the switch to the Verde master node, are encountered when tracing the packet.