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NETWORKING

Integrating Oracle's Virtual Compute Appliance with a Data Center LAN Using Oracle Switch ES1-24

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Introduction

This white paper outlines the physical connectivity solutions supported by Oracle's Virtual Compute Appliance engineered system and Oracle Switch ES1-24 for connecting to a data center's 1/10 GbE network infrastructures.

Integrating Virtual Compute Appliance with a Data Center LAN

Virtual Compute Appliance is the latest engineered system from Oracle, and it offers a turnkey converged infrastructure solution for private clouds and any virtualized application. It is a highly available, fully redundant converged system with compute, network, management, and storage elements combined. The hardware specifications are given below in Figure 1.

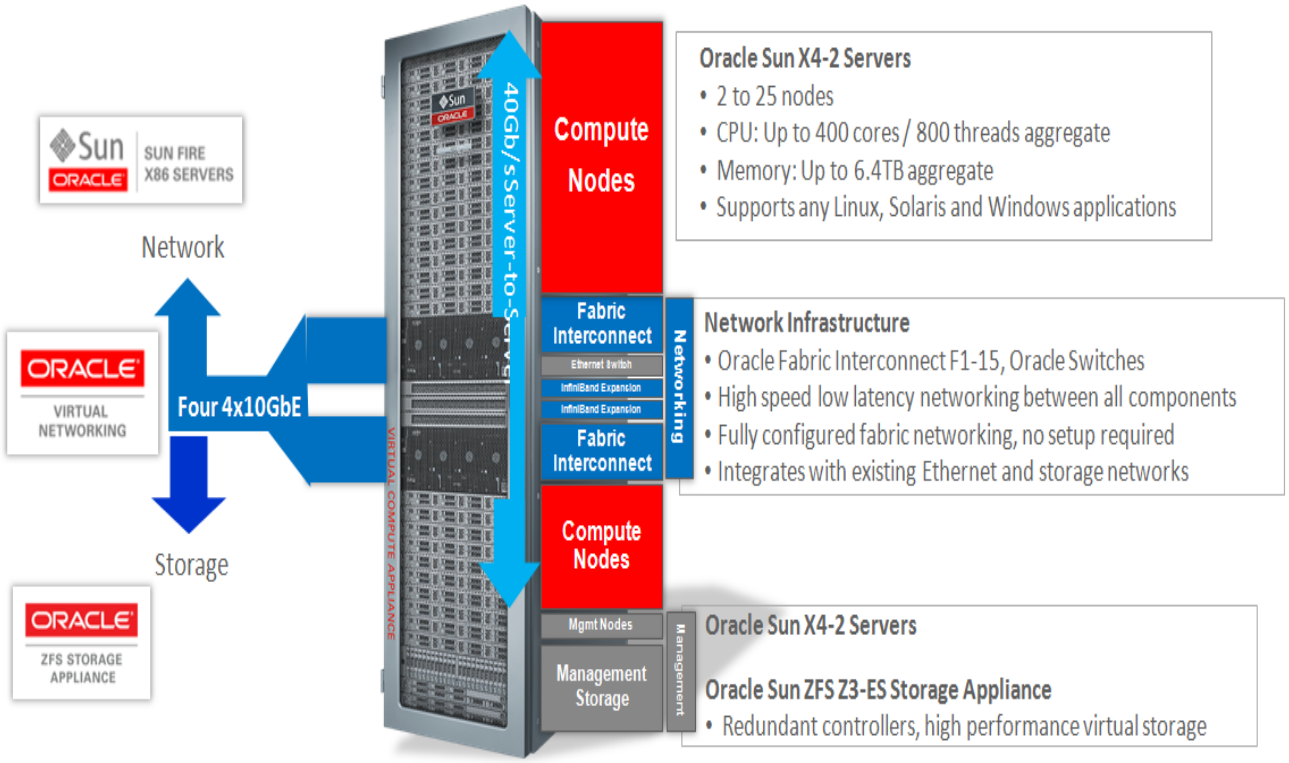

Figure 1: Virtual Compute Appliance hardware overview

Virtual Compute Appliance has two Oracle Switch ES1-24 switches within the rack that serve as the management switch for the entire engineered system. The Oracle Virtual Networking fabric directors provide the rack connectivity to a data center LAN and storage networks. This paper outlines the connectivity option for only the data center LAN. The storage network connectivity is outside the scope of this paper.

Figure 2 shows the cable map for the Virtual Compute Appliance system.

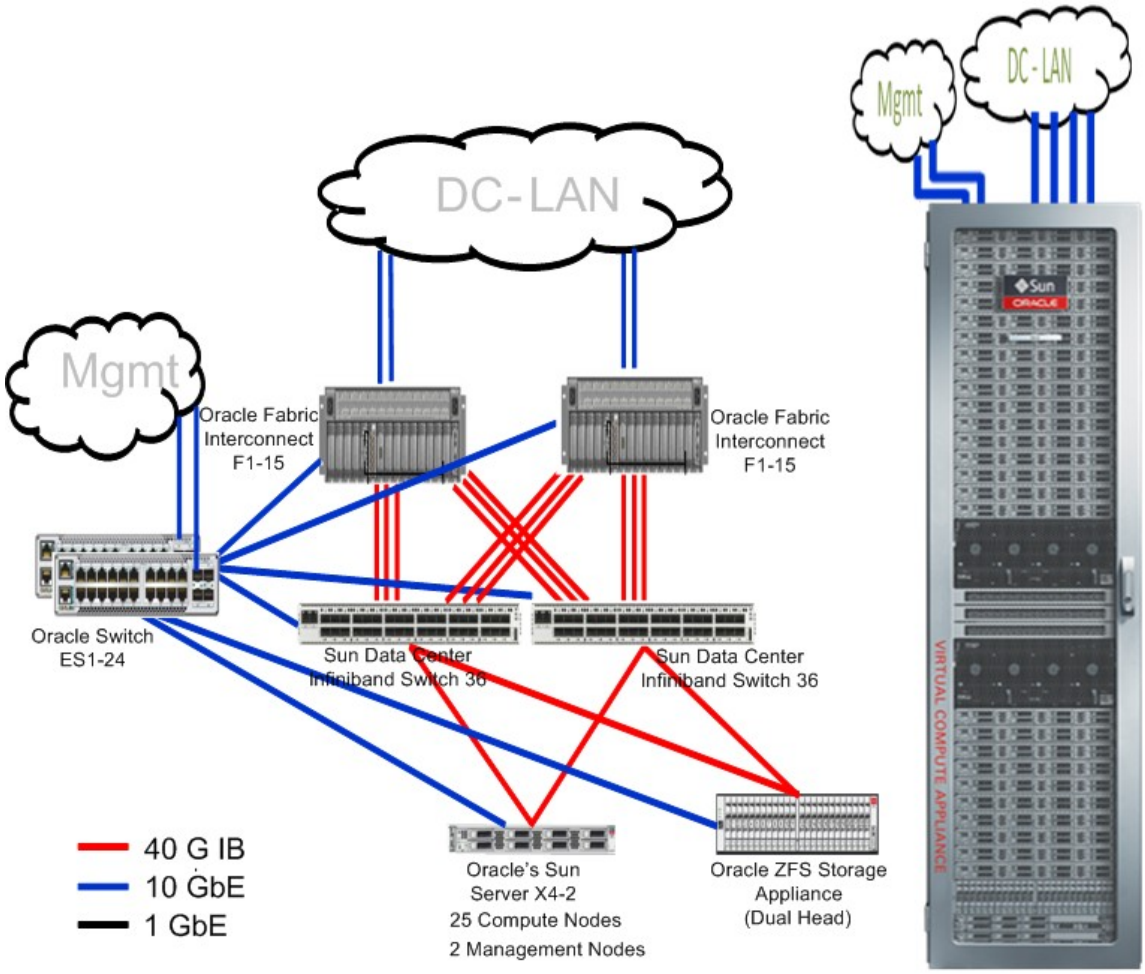

Figure 2: Oracle Virtual Compute Appliance cable map

The proposed networking configuration utilizes two Oracle Switch ES1-24 switches that are connected to the Oracle Virtual Networking fabric directors in the Virtual Compute Appliance rack for the purpose of connecting the Virtual Compute Appliance rack to the data center network. The two Oracle Virtual Networking fabric directors within the rack come with two 4x10 GbE Ethernet I/O modules. Each I/O module has four 10 GbE SFP+ ports. Oracle Switch ES1-24 is a 10 GbE switch that is a 1U half-width and has 24-port access, including 20x10 GBase-T ports with 100 Mbps/1/10 Gb/sec auto-negotiation and four 10 G SFP+ ports. Oracle Switch ES1-24 comes with industry-standard L2 and L3 features, logical link aggregation, server load balancing, and support for virtualization. The data sheet and product related information for Oracle Switch ES1-24 is available here.

Virtual Compute Appliance to Data Center 10 GbE Network

For a data center's 10 GbE network, these 10 GbE SFP+ ports from Oracle Virtual Networking are connected to the 10 GbE SFP+ on Oracle Switch ES1-24. The 10 GBase-T ports on Oracle Switch ES1-24 are connected to the 10

GBase-T ports on the core switch using RJ45 cables. This configuration applies to the scenario in which the core switches have 10 GBase-T ports to connect to downstream switches.

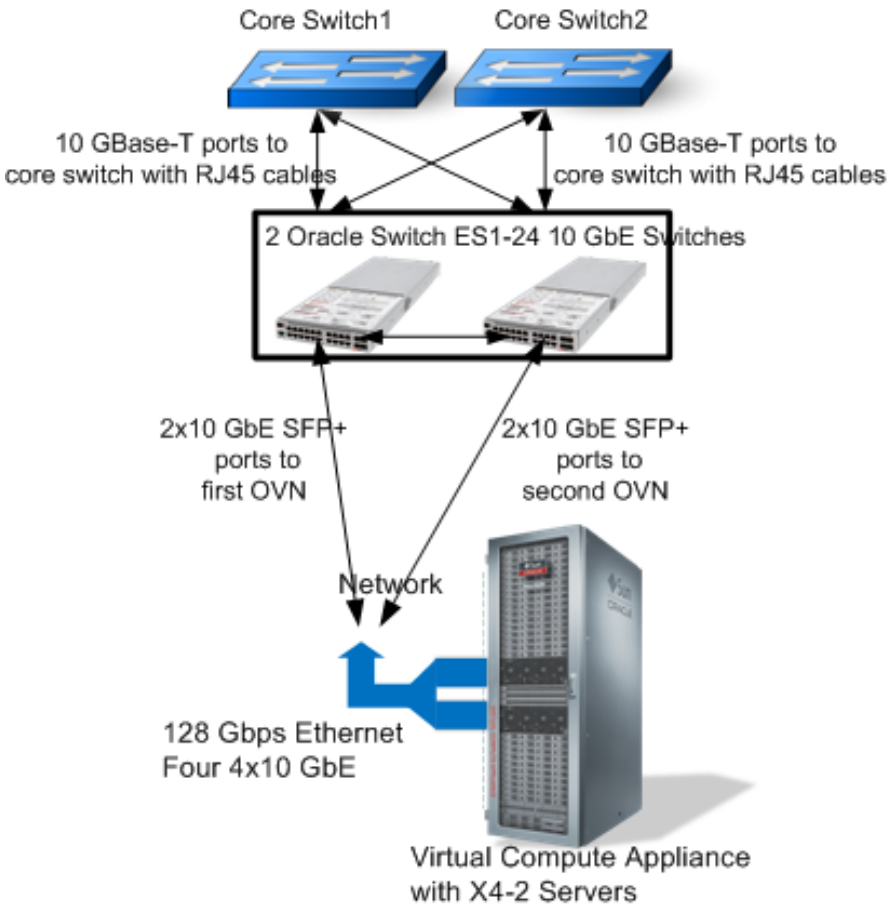

Figure 3: Data center 10 GBase-T LAN connectivity with Virtual Compute Appliance

The components required for this networking configuration are provided in Table 1.

TABLE 1: COMPONENTS REQUIRED FOR CONNECTING VIRTUAL COMPUTE APPLIANCE TO 10 GBE NETWORK

Quantity	Part Number	Description
2	7105443	Oracle Switch ES1-24 10 GbE switch with front-to-rear air flow
Connections for Oracle Switch ES1-24 to UPLINK		
		RJ45 cables
Connections to Oracle Virtual Networking Fabric Directors		
4	Industry standard	Cables for connecting to Virtual Compute Appliance

4	(X)2129A-N	10 Gb/sec Optical SFP+ SR transceiver or
4	(X)5562A-Z	10 Gb/sec Optical SFP+ LR transceiver
4	(X)2130A-1M-N Or (X)2130A-3M-N Or (X)2130A-5M-N	Direct-attach cables without the need for optical transceivers SFP+ to SFP+ 1 Meter, Twin-ax Passive Copper SFP+ to SFP+ 3 Meter, Twin-ax Passive Copper SFP+ to SFP+ 5 Meter, Twin-ax Passive Copper

Another option for a data center's 10 GbE network is to connect the 2x10 GbE SFP+ ports on the Oracle Switch ES1-24 switch to the 10 GbE SFP+ ports on the Oracle Virtual Networking I/O modules of the Virtual Compute Appliance rack and the remaining 2x10 GbE SFP+ ports to the core switch. This works in the scenario in which the core switches have 10 GbE SFP+ ports to connect to downstream switches.

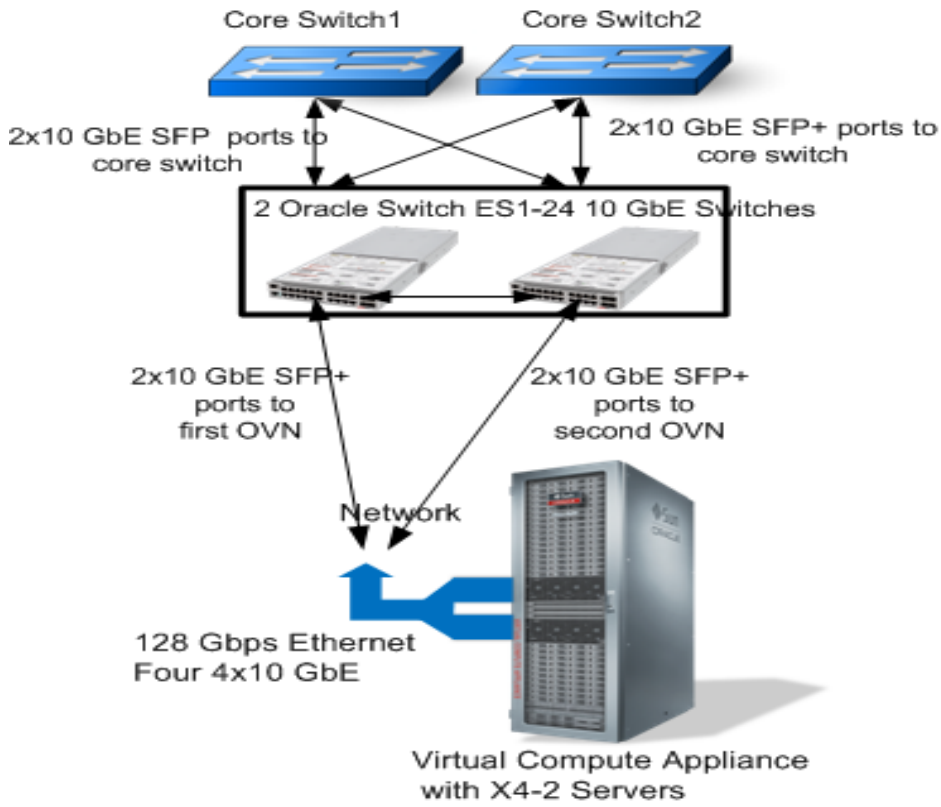

Figure 4: Data center 10 GbE SFP+ LAN connectivity with Virtual Compute Appliance

The components required for this networking configuration are provided in Table 2.

TABLE 2: COMPONENTS REQUIRED FOR CONNECTING VIRTUAL COMPUTE APPLIANCE TO 10 GBE NETWORK

Quantity	Part Number	Description
2	7105443	Oracle Switch ES1-24 10 GbE switch with front-to-rear air flow
Connections for Oracle Switch ES1-24 to UPLINK		
4	Industry standard	Cables for connecting to core switch
4	(X)2129A-N	10 Gb/sec Optical SFP+ SR transceiver or
4	(X)5562A-Z	10 Gb/sec Optical SFP+ LR transceiver
4	(X)2130A-1M-N Or (X)2130A-3M-N Or (X)2130A-5M-N	Direct-attach cables without the need for optical transceivers SFP+ to SFP+ 1 Meter, Twin-ax Passive Copper SFP+ to SFP+ 3 Meter, Twin-ax Passive Copper SFP+ to SFP+ 5 Meter, Twin-ax Passive Copper
Connections to Oracle Virtual Networking Fabric Directors		
4	Industry standard	Cables for connecting to Virtual Compute Appliance
4	(X)2129A-N	10 Gb/sec Optical SFP+ SR or
4	(X)5562A-Z	10 Gb/sec Optical SFP+ LR
4	(X)2130A-1M-N Or (X)2130A-3M-N Or (X)2130A-5M-N	Direct-attach cables without the need for optical transceivers SFP+ to SFP+ 1 Meter, Twin-ax Passive Copper SFP+ to SFP+ 3 Meter, Twin-ax Passive Copper SFP+ to SFP+ 5 Meter, Twin-ax Passive Copper

Virtual Compute Appliance to Data Center 1 GbE Network

For a data center's 1 G network, depending on the port type on the core switch, there are three options. If the core switch has 1 GBase-T ports, then the core switch 1GBase-T ports are connected with RJ45 cables to the 10 GBase-T ports on the Oracle Switch ES1-24. And the 10 GbE SFP+ ports on Oracle Switch ES1-24 are connected to the 10 GbE ports on the Oracle Virtual Networking I/O module. This configuration requires the same parts as mentioned in Table 1.

If the core switch has 1 GbE SFP+ ports, then two 10 GbE SFP+ ports from Oracle Switch ES1-24 are connected to the 1 GbE SFP+ ports on the core switch, and the remaining 2x10 GbE SFP+ ports are connected to the 10 GbE ports on the Oracle Virtual Networking I/O modules. This configuration requires the same parts as mentioned in Table 2.

Furthermore, for connecting 1 GbE SFP+ ports to the 10 Gbase-T ports on Oracle Switch ES1-24, the configuration requires SFP+ to 1 Gbase-T adapters, which have the part number (X)2123A-N.

Conclusion

There are many variables when connecting and configuring Oracle's Virtual Compute Appliance engineered system to a data center network. This document is an attempt to simplify that process and reduce risk for Oracle customers by providing information for how to use Oracle networking products with Virtual Compute Appliance.

References

For more information, visit the web resources listed in Table 4.

TABLE 4. WEB RESOURCES FOR FURTHER INFORMATION

Web Resource Description	Web Resource URL
Virtual Compute Appliance	http://www.oracle.com/technetwork/server-storage/engineered-systems/virtual-compute-appliance-1983146.html
Oracle Virtual Networking	http://www.oracle.com/us/products/networking/virtual-networking/fabric-interconnect/overview/index.html
Oracle Switch ES1-24	www.oracle.com/us/products/networking/ethernet/switch-es1-24/overview/
Oracle's Sun Ethernet Fabric Operating System CLI Base Reference Manual	http://docs.oracle.com/cd/E19934-01/html/E26513/

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