

Oracle® Communications

Diameter Signaling Router

DSR Rack Mount Server Network Interconnect Guide

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Oracle Diameter Signaling Router Networking Interconnect

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1. INTRODUCTION

1.1 PURPOSE

This document describes the Diameter Signaling Router 7.1.1/7.2/8.x networking for DSR on rack mount servers. In this deployment, all network elements such as NOAM, SOAM, DA-MP, SS7-MP, IPFE, SDS DP(Oracle X5-2/Netra X5-2/X6-2/X7-2 HP DL380 Gen 9 Only), SBR (Oracle X5-2/Netra X5-2/X6-2/X7-2/ HP DL380 Gen 9 Only), IDIH and PMAC are running as guests on a rack mount servers running TVOE.

This document specifies point to point interconnection and is intended for the use of Oracle internal departments.

The only server types supported in this TR are HP DL380 Gen8/Gen9, Oracle X5-2/X6-2/X7-2 and Netra X5-2. They are all referred to as RMS (Rack Mount Server) throughout this TR.

1.2 ACRONYMS

| Item | DESCRIPTION |
|------|--|
| 10G | 10 Gigabits per second |
| 1G | 1 Gigabit per second |
| DSR | Diameter Signaling Router |
| iLO | Integrated Lights-Out |
| iLOM | Integrated Lights Out Manager |
| NIC | Network Interface Card |
| OOBM | Out of Band Management - references access via iLO, iLOM, or other out of band access method |
| PCI | Peripheral Component Interconnect |
| RJ45 | Registered Jack 45 (RJ45) is a standard type of physical connector for network cables. RJ45 connectors are most commonly seen with Ethernet cables and networks. |
| RMS | Rack Mount Server |
| SFP | Small form-factor pluggable, or SFP, devices are hot-swappable I/O gear used primarily in network and storage switches. |
| VLAN | Virtual Local Area Network |
| VM | Virtual Machine |

1.3 REFERENCES

1.3.1 External References

- [1] Oracle® Server X5-2 Service Manual, https://docs.oracle.com/cd/E41059_01/pdf/E48320.pdf
- [2] Netra Server X5-2 Service Manual, https://docs.oracle.com/cd/E53596_01/pdf/E53601.pdf
- [3] Oracle® Server X6-2 Service Manual, https://docs.oracle.com/cd/E62159_01/pdf/E62171.pdf
- [4] Oracle® Server X7-2 Service Manual, https://docs.oracle.com/cd/E72435_01/pdf/E72445.pdf

1.3.2 Internal References

- [5] HP Gen8 HW, CGBU_ENG_24_2297
- [6] HPE Gen9 HW, CGBU_ENG_24_2434
- [7] Oracle CGBU 10GE RMS Frame Design, Technical Reference, CGBU_018401

2. INTERCONNECTION NAMING CONVENTIONS

The following is the naming convention:

- ag(x)
 - where ag(x) = aggregate_switch(number) ie, ag1 (aka switch1A)
- rms(x)
 - where rms(x)=rackmount server(number) ie, rms1, rms2
- rms(x)-ms(y)
 - where rms(x)=rack mount server(number) ie, rms1, rms2
 - where ms(y) = management_server(number) ie, ms1, ms2
- NICx / NETx
 - where x=the port number as per port designations of respective hardware.

Table 1: NIC/Server Type Cross Reference

| NIC ID | HP DL380 Gen 8 (Refer to section A-1 for the port designations used below) | HP DL380 Gen 9 (Refer to section A-2 for the port designations used below) | Oracle X5-2 / X6-2 Config 0 (LOM only) (Refer to section A-3 for the port designations used below) | Oracle X5-2 / X6-2 Config 1 (LOM and qty 1 dual port PCI) (Refer to section A-3 for the port designations used below) | Netra X5-2 Config 0 (LOM only) (Refer to section A-4 for the port designations used below) | Netra X5-2 Config 1 (LOM and qty 1 dual port PCI) (Refer to section A-4 for the port designations used below) | Netra X7-2 10GE-RMS-1 [7] (Refer to section A-5 for the port designations used below) |
|--------|---|---|---|--|---|--|--|
| NIC1 | NIC1 | NIC5 | NET0 | NET0 | NET0 | NET0 | NET1 |
| NIC2 | NIC2 | NIC6 | NET2 | NET2 | NET2 | NET2 | NET2 |
| NIC3 | NIC3 | N/A | N/A | N/A | N/A | N/A | N/A |
| NIC4 | NIC4 | N/A | N/A | NET31 | N/A | NET11 | N/A |
| NIC5 | NIC11 | NIC11 or NIC31 | NET1 | NET1 | NET1 | NET1 | N/A |
| NIC6 | NIC12 | NIC12 or NIC32 | NET3 | NET3 | NET3 | NET3 | N/A |
| NIC7 | NIC13 | N/A | N/A | NET30 | N/A | NET10 | N/A |
| NIC8 | NIC14 | N/A | N/A | N/A | N/A | N/A | N/A |

Note: Ethernet ports on Oracle servers (i.e. X5-2 / X6-2 / X7-2 and Netra X5-2) are labelled as NETx. Although, Ethernet ports for HP machines are labelled as NICx.

3. OVERVIEW OF DSR NETWORKS

The following table presents an overview of the networks configured and used by DSR. Based on the deployment type/requirements, the networks could be physically or logically separated via VLANs.

Table 2: DSR Networks

| Network Name | Default VLAN ID* | Routable | Description |
|---------------|------------------|----------|---|
| Control | 1 | No | Network used by PMAC to IPM the servers/blades/VMs. (IPs are assigned via by the PMAC using DHCP) |
| Management | 2 | Yes | Network used for iLO interfaces, OAs, and enclosure switches. Also used to provide remote access to the TVOE and PMAC servers |
| XMI | 3 | Yes | Network used to provide access to the DSR entities (GUI, ssh), and for inter-site communication |
| IMI | 4 | No | Network used for intra-site communication |
| XSI-1 | 5 | Yes | Network used for DSR signaling Traffic |
| XSI-2** | 6 | Yes | Network used for DSR signaling Traffic |
| XSI-3** | 7 | Yes | Network used for DSR signaling Traffic |
| XSI-4** | 8 | Yes | Network used for DSR signaling Traffic |
| Replication** | 9 | Yes | Network used for DSR secondary replication traffic (i.e PCA) |
| INT** | 10 | No | Network used for IDIH intra-site communication |
| Backup** | N/A | Yes | Optional dedicated network used for backup purposes |

4. RMS PRODUCTIZATION HP DL380 GEN 8 / 1G HP DL380 GEN 9 NETWORK TOPOLOGIES

4.1 DEPLOYMENT NON-SEGREGATED SIGNALING WITH AGGREGATION SWITCHES WITH L2/L3 DEMARCATION

Characteristics:

- Aggregate all traffic from rack mount servers into a smaller number of uplinks.
- Reduce number of interconnects into Customer network.
- Support separation of traffic (such as OAM and Signaling traffic) at the aggregation switch level by providing separate uplinks into Customer networks.
- Prevent any inter-enclosure traffic from impacting Customer network.
- In some cases, allow integration with customer Layer 2 domain
- In some cases, allow customer routers/firewalls to define the Layer 2 boundaries.
- In some cases, hide the Layer-2 topology and provide Layer-3 interfaces to customer networks.
- In layer 3 demarcation configurations, prevent any VLAN ID conflicts with Customer L2 domain.
- For inter-server traffic, prevent any private IP address conflicts with Customer network.
- Provides an optional connection to a customer provided backup Network

Note: HP DL380 Gen8 / 1G HP DL380 GEN 9 network topologies are valid only for RMS productization.

Figure 1: Logical Diagram of HP DL380 GEN 8 / GEN 9 RMS deployment using aggregation switches(L2/L3 Demarcation)

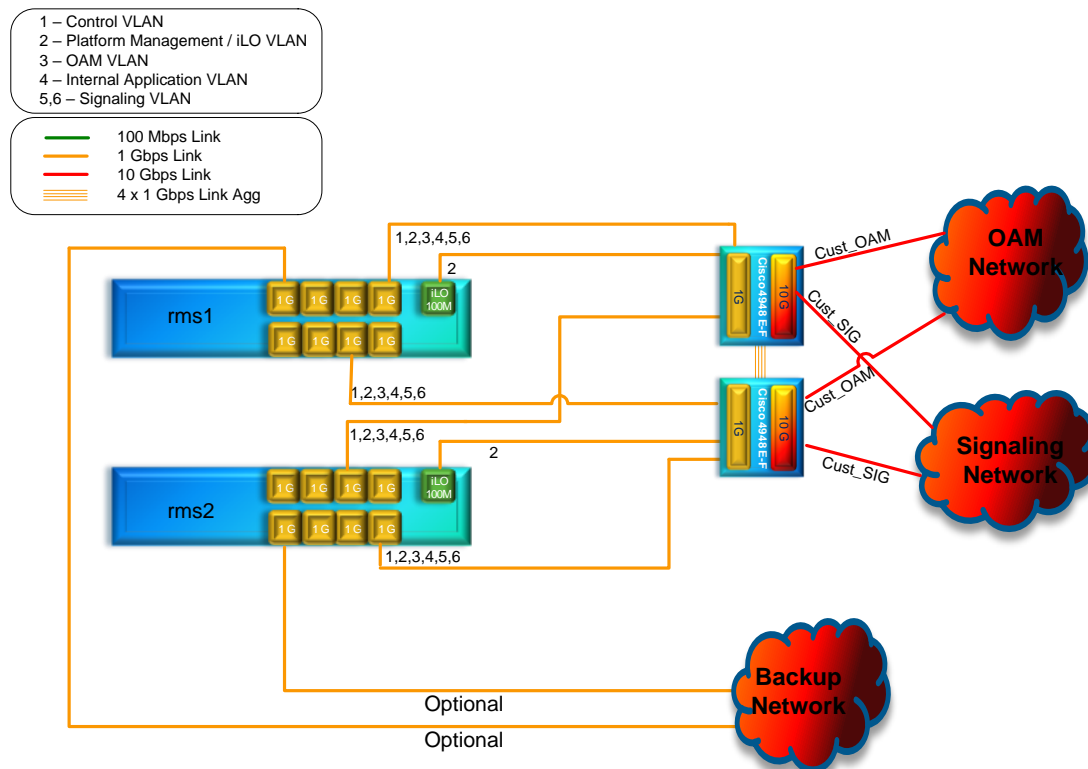


Table 3: Aggregation Switch (L2/L3 Demarcation) Interconnect Table

| Item # | Port (to) | Port (from) |
|--------------------------------|--------------------------------------|---|
| Aggregation Switches | | |
| 1 | ag1 port 1 | ag2 port 1 |
| 2 | ag1 port 2 | ag2 port 2 |
| 3 | ag1 port 3 | ag2 port 3 |
| 4 | ag1 port 4 | ag2 port 4 |
| 5 | ag1 port 49 | Uplink to Customer OAM Network |
| 6 | ag1 port 50 | Uplink to Customer Signaling Network |
| 7 | ag2 port 49 | Uplink to Customer OAM Network |
| 8 | ag2 port 50 | Uplink to Customer Signaling Network |
| Rack Mount Server 1 | | |
| 9 | rms1 NIC1 | ag1 port 40 |
| 10 | rms1 NIC2 | ag2 port 40 |
| 11 | rms1 NIC8 | Customer Backup Network (Optional) |
| 12 | rms1 iLO | Customer OAM Network / Optional ag1 port 41 |
| 13 | rms1 Serial 1 (fan-out cable) | ag1 console |
| 14 | rms1 Serial 2 (fan-out cable) | ag2 console |
| Rack Mount Server 2 | | |
| 15 | rms2 NIC1 | ag1 port 42 |
| 16 | rms2 NIC2 | ag2 port 42 |
| 17 | rms2 NIC8 | Backup Network (Optional) |
| 18 | rms2 iLO | Customer OAM Network / Optional ag2 port 41 |
| Rack Mount Server 3 – Optional | | |
| 19 | rms3 NIC1 | ag1 port 32 |
| 20 | rms3 NIC2 | ag2 port 32 |
| 21 | rms4 NIC3 (Only used if running DIH) | ag1 port 43 |
| 22 | rms3 NIC4 (Only used if running DIH) | ag2 port 43 |
| 23 | rms3 iLO | ag1 port 39 |
| Rack Mount Server 4 - Optional | | |
| 1 | rms4 NIC1 | ag1 port 31 |
| 2 | rms4 NIC2 | ag2 port 31 |
| 3 | rms4 iLO | ag2 port 39 |
| Rack Mount Server 5 – Optional | | |
| 1 | rms5 NIC1 | ag1 port 30 |
| 2 | rms5 NIC2 | ag2 port 30 |
| 3 | rms5 iLO | ag1 port 38 |
| Rack Mount Server 6 – Optional | | |
| 1 | rms6 NIC1 | ag1 port 29 |
| 2 | rms6 NIC2 | ag2 port 29 |
| 3 | rms6 iLO | ag2 port 38 |
| Rack Mount Server 7 - Optional | | |
| 4 | rms7 NIC1 | ag1 port 28 |
| 5 | rms7 NIC2 | ag2 port 28 |
| 6 | rms7 iLO | ag1 port 37 |

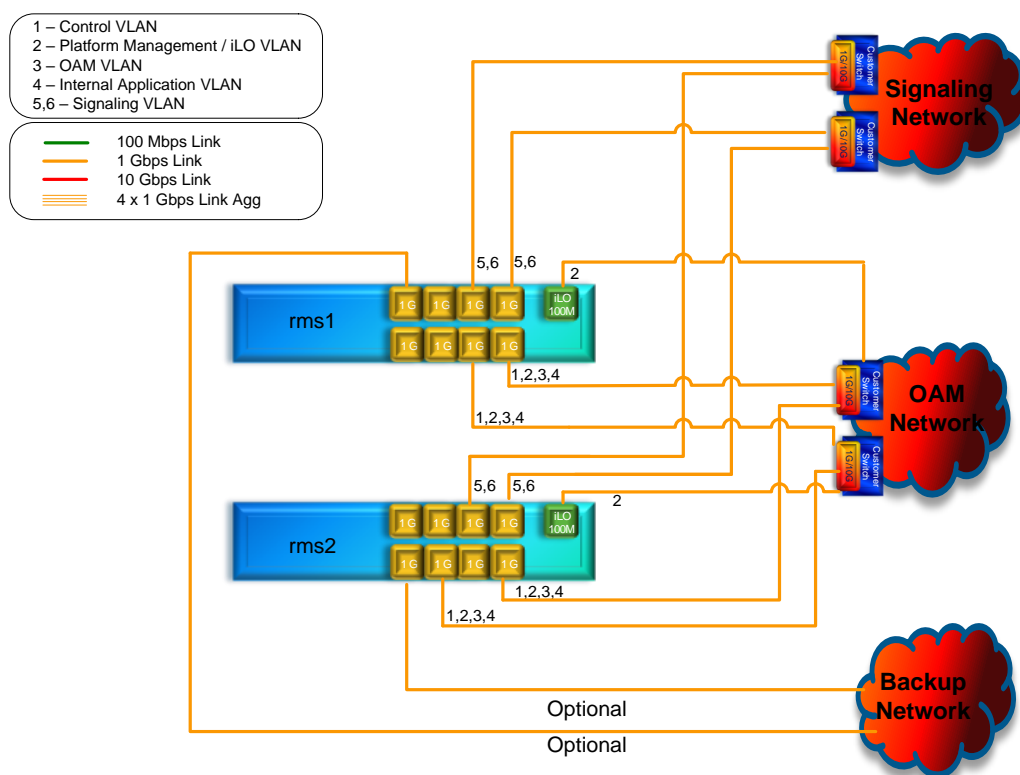
4.2 DEPLOYMENT SEGREGATED SIGNALING W/O AGGREGATION SWITCHES

Characteristics:

- Support Customer deployments where aggregation switches are not feasible (for network policy reasons etc.).
- Although Control and IMI traffic are not routable, they need to use the customer-provided switches for interconnectivity and should be logically separated via VLANs.
- OAM and Management traffic is logically separated via VLANs.
- Provides a dedicated physical connection for Signaling traffic.
- Provides an optional connection to a customer provided backup Network

Note: DL380 Gen8 network topologies are valid only for RMS productization.

Figure 2: Logical Diagram of HP DL380 GEN 8 / GEN 9 RMS deployment without Aggregation Switches



Note: This deployment assumes that the customer will allow non-routable traffic (control, IMI) to be handled by the switches to which the servers are connected.

Note: This figure is a logical representation to show the network design, and not meant in any way to define actual physical port locations on the servers. This figure also doesn't show the connections for optional expansion RMSs which might be used to host additional MPs, iDiH. Please refer to the interconnect tables below for information regarding how the physical ports are connected.

Table 4: HPDL380 Gen 8 without Aggregation Switches Interconnect Table

| Item # | Port (to) | Port (from) |
|--------------------------------|-----------|-------------------------------------|
| Rack Mount Server 1 | | |
| 1 | rms1 NIC1 | Customer Switch 1/OAM Network |
| 2 | rms1 NIC2 | Customer Switch 2/OAM Network |
| 3 | rms1 NIC3 | Customer Switch 1/Signaling Network |
| 4 | rms1 NIC7 | Customer Switch 2/Signaling Network |
| 5 | rms1 NIC8 | Backup Network (Optional) |
| 6 | rms1 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 2 | | |
| 7 | rms2 NIC1 | Customer Switch 1/OAM Network |
| 8 | rms2 NIC2 | Customer Switch 2/OAM Network |
| 9 | rms2 NIC3 | Customer Switch 1/Signaling Network |
| 10 | rms2 NIC7 | Customer Switch 2/Signaling Network |
| 11 | rms2 NIC8 | Backup Network (Optional) |
| 12 | rms2 iLO | Customer Switch 2/OAM Network |
| Rack Mount Server 3 - Optional | | |
| 13 | rms3 NIC1 | Customer Switch 1/OAM Network |
| 14 | rms3 NIC2 | Customer Switch 2/OAM Network |
| 15 | rms3 NIC3 | Customer Switch 1/Signaling Network |
| 16 | rms3 NIC7 | Customer Switch 2/Signaling Network |
| 17 | rms3 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 4 – Optional | | |
| 18 | rms4 NIC1 | Customer Switch 1/OAM Network |
| 19 | rms4 NIC2 | Customer Switch 2/OAM Network |
| 20 | rms4 NIC3 | Customer Switch 1/Signaling Network |
| 21 | rms4 NIC7 | Customer Switch 2/Signaling Network |
| 22 | rms4 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 5 – Optional | | |
| 23 | rms5 NIC1 | Customer Switch 1/OAM Network |
| 24 | rms5 NIC2 | Customer Switch 2/OAM Network |
| 25 | rms5 NIC3 | Customer Switch 1/Signaling Network |
| 26 | rms5 NIC7 | Customer Switch 2/Signaling Network |
| 27 | rms5 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 6 – Optional | | |
| 28 | rms6 NIC1 | Customer Switch 1/OAM Network |
| 29 | rms6 NIC2 | Customer Switch 2/OAM Network |
| 30 | rms6 NIC3 | Customer Switch 1/Signaling Network |
| 31 | rms6 NIC7 | Customer Switch 2/Signaling Network |
| 32 | rms6 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 7 – Optional | | |
| 33 | rms7 NIC1 | Customer Switch 1/OAM Network |
| 34 | rms7 NIC2 | Customer Switch 2/OAM Network |
| 35 | rms7 NIC3 | Customer Switch 1/Signaling Network |
| 36 | rms7 NIC7 | Customer Switch 2/Signaling Network |
| 37 | rms7 iLO | Customer Switch 1/OAM Network |

5. VEDSR ORACLE X5-2/NETRA X5-2/X6-2/HP DL380 GEN 9 NETWORK TOPOLOGIES

5.1 ORACLE X5-2 / X6-2 / NETRA X5-2 / 10G HP DL380 GEN 9 DEPLOYMENT SEGREGATED SIGNALING NETWORK W/O AGGREGATION SWITCHES

Characteristics:

- Deployment on Cisco 4948E-F is **NOT** supported on Oracle X5-2/Netra X5-2/X6-2/HP DL380 Gen 9 rack mount servers due to the 1Gbps port bandwidth limitation. It is recommended that a customer deployed switch capable of 10Gbps port bandwidth capabilities be deployed to achieve optimal performance.
- Although Control and IMI traffic are not routable, they need to use the customer-provided switches for interconnectivity and should be logically separated via VLANs.
- OAM and Management traffic is logically separated via VLANs.
- Provides a dedicated physical connection for Signaling traffic.
- Provides an optional connection to a customer provided backup Network

Notes:

- Oracle X5-2 / X6-2 / Netra X5-2 and DL380 Gen9 network topologies are only valid for RMS VE-DSR based deployments.
- For HP DL380 Gen 9 servers, one 2pt 10 Gigabit FlexibleLOM card and one 2pt 10 Gigabit PCI card are required while running the segregated signaling network topology

Figure 3 Logical Diagram of Oracle X5-2/Netra X5-2/X6-2/HP DL380 Gen 9 Deployment with Segregated Signalling network

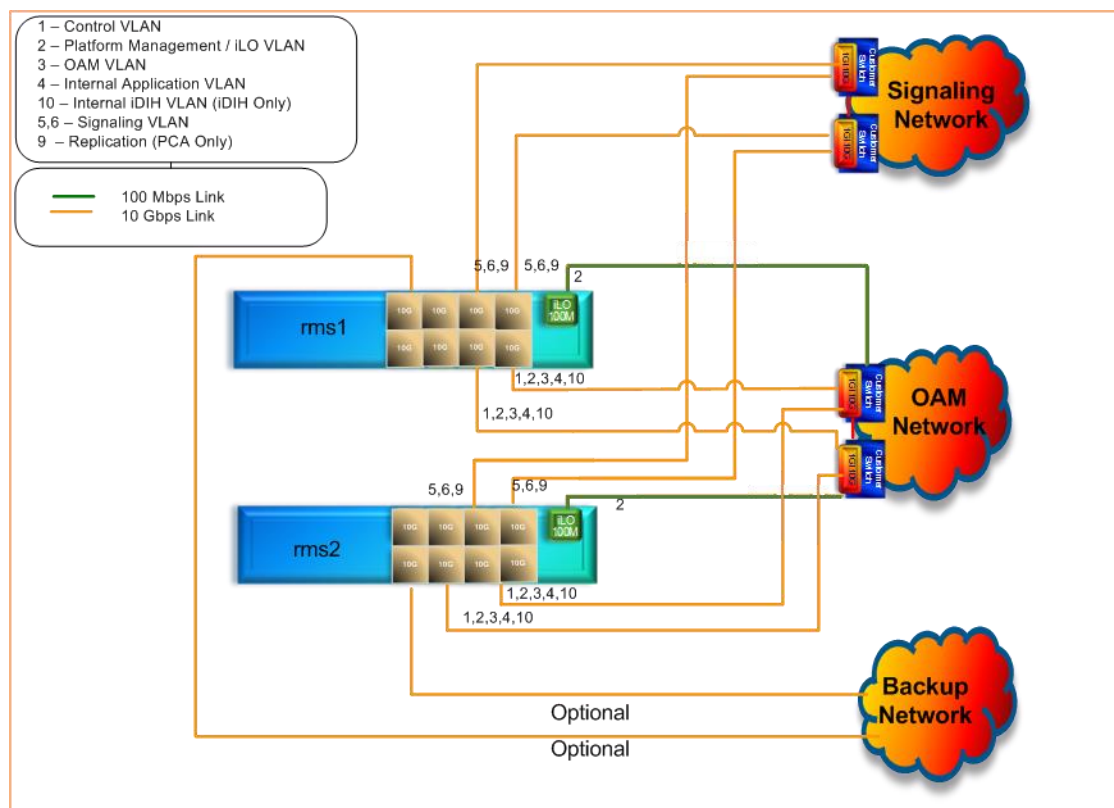


Table 5: Interconnect Table for Segregated Signaling Network

| Item # | Port (to) | Port (from) |
|---------------------|-----------|-------------------------------------|
| Rack Mount Server 1 | | |
| 1 | rms1 NIC1 | Customer Switch 1/OAM Network |
| 2 | rms1 NIC2 | Customer Switch 2/OAM Network |
| 3 | rms1 NIC5 | Customer Switch 1/Signaling Network |
| 4 | rms1 NIC6 | Customer Switch 2/Signaling Network |
| 5 | rms1 NIC4 | Backup Network (Optional) |
| 6 | rms1 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 2 | | |
| 7 | rms2 NIC1 | Customer Switch 1/OAM Network |
| 8 | rms2 NIC2 | Customer Switch 2/OAM Network |
| 9 | rms2 NIC5 | Customer Switch 1/Signaling Network |
| 10 | rms2 NIC6 | Customer Switch 2/Signaling Network |
| 11 | rms2 NIC4 | Backup Network (Optional) |
| 12 | rms2 iLO | Customer Switch 2/OAM Network |
| Rack Mount Server 3 | | |
| 13 | rms3 NIC1 | Customer Switch 1/OAM Network |
| 14 | rms3 NIC2 | Customer Switch 2/OAM Network |
| 15 | rms3 NIC5 | Customer Switch 1/Signaling Network |
| 16 | rms3 NIC6 | Customer Switch 2/Signaling Network |
| 17 | rms3 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 4 | | |
| 18 | rms4 NIC1 | Customer Switch 1/OAM Network |
| 19 | rms4 NIC2 | Customer Switch 2/OAM Network |
| 20 | rms4 NIC5 | Customer Switch 1/Signaling Network |
| 21 | rms4 NIC6 | Customer Switch 2/Signaling Network |
| 22 | rms4 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 5 | | |
| 23 | rms5 NIC1 | Customer Switch 1/OAM Network |
| 24 | rms5 NIC2 | Customer Switch 2/OAM Network |
| 25 | rms5 NIC5 | Customer Switch 1/Signaling Network |
| 26 | rms5 NIC6 | Customer Switch 2/Signaling Network |
| 27 | rms5 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 6 | | |
| 28 | rms6 NIC1 | Customer Switch 1/OAM Network |
| 29 | rms6 NIC2 | Customer Switch 2/OAM Network |
| 30 | rms6 NIC5 | Customer Switch 1/Signaling Network |
| 31 | rms6 NIC6 | Customer Switch 2/Signaling Network |
| 32 | rms6 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 7 | | |
| 33 | rms7 NIC1 | Customer Switch 1/OAM Network |
| 34 | rms7 NIC2 | Customer Switch 2/OAM Network |
| 35 | rms7 NIC5 | Customer Switch 1/Signaling Network |
| 36 | rms7 NIC6 | Customer Switch 2/Signaling Network |
| 37 | rms7 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 8 | | |
| 38 | rms8 NIC1 | Customer Switch 1/OAM Network |
| 39 | rms8 NIC2 | Customer Switch 2/OAM Network |
| 40 | rms8 NIC5 | Customer Switch 1/Signaling Network |
| 41 | rms8 NIC6 | Customer Switch 2/Signaling Network |
| 42 | rms8 iLO | Customer Switch 1/OAM Network |

5.2 ORACLE X5-2 / X6-2 / NETRA X5-2 / 10G HP DL380 GEN 9 DEPLOYMENT NON-SEGREGATED SIGNALING NETWORK

Characteristics:

- Deployment on Cisco 4948E-F is **NOT** supported on Oracle X5-2/Netra X5-2/X6-2/HP DL380 Gen 9 rack mount servers due to the 1Gbps port bandwidth limitation. It is recommended that a customer deployed switch capable of 10Gbps port bandwidth capabilities be deployed to achieve optimal performance.
- Although Control and IMI traffic are not routable, they need to use the customer-provided switches for interconnectivity and should be logically separated via VLANs.
- Provides an optional connection to a customer provided backup Network
- Deployment with X7-2s is not supported.

Note:

- Oracle X5-2 / X6-2 / Netra X5-2 and DL380 Gen9 network topologies are only valid for RMS VE-DSR based deployments.
- For HP DL380 Gen 9 servers, one 2pt 10 Gigabit FlexibleLOM card is required while running the non-segregated signaling network topology

Figure 4: Logical Diagram of Oracle X5-2/Netra X5-2/X6-2/HP DL380 Gen 9 Deployment without Segregated Signalling network

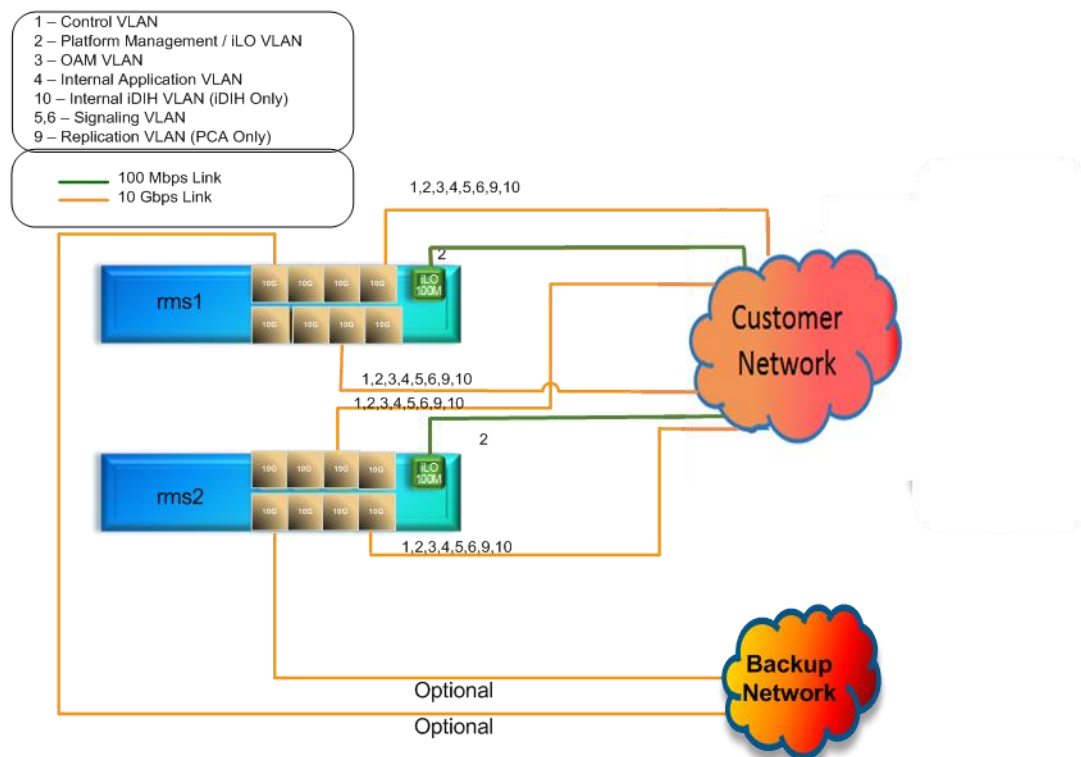


Table 6: Interconnect Table for Non-Segregated Signaling Network for Oracle X5-2/X6-2/Netra X5-2/10G HP DL380 Gen9

| Item # | Port (to) | Port (from) |
|---------------------|-----------|---|
| Rack Mount Server 1 | | |
| 1 | rms1 NIC1 | Customer Switch 1/OAM,Signaling Network |
| 2 | rms1 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 3 | rms1 NIC4 | Backup Network (Optional) |
| 4 | rms1 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 2 | | |
| 5 | rms2 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 6 | rms2 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 7 | rms2 NIC4 | Backup Network (Optional) |
| 8 | rms2 iLO | Customer Switch 2/OAM Network |
| Rack Mount Server 3 | | |
| 9 | rms3 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 10 | rms3 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 11 | rms3 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 4 | | |
| 12 | rms4 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 13 | rms4 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 14 | rms4 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 5 | | |
| 15 | rms5 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 16 | rms5 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 17 | rms5 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 6 | | |
| 18 | rms6 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 19 | rms6 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 20 | rms6 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 7 | | |
| 21 | rms7 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 22 | rms7 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 23 | rms7 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 8 | | |
| 24 | rms8 NIC1 | Customer Switch 1/ OAM, Signaling Network |
| 25 | rms8 NIC2 | Customer Switch 2/ OAM, Signaling Network |
| 26 | rms8 iLO | Customer Switch 1/OAM Network |

5.3 ORACLE X7-2 DEPLOYMENT NON-SEGREGATED SIGNALING NETWORK W/O AGGREGATION SWITCHES

Characteristics:

- This deployment is only supported for X7-2s.
- Although Control and IMI traffic are not routable, they need to use the customer-provided switches for interconnectivity and should be logically separated via VLANs.
- No provision for configuring backup network.

Figure 5: Logical Diagram of Oracle X7-2 Deployment without Segregated Signalling network

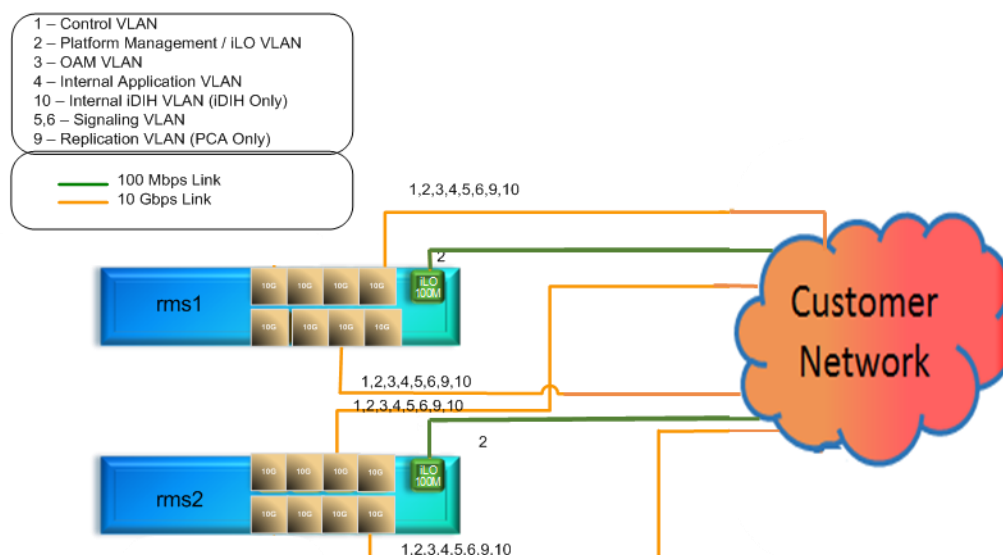


Table 7: Interconnect Table for Non-Segregated Signaling Network for Oracle X7-2

| Item # | Port (to) | Port (from) |
|---------------------|-----------|--|
| Rack Mount Server 1 | | |
| 1 | rms1 NIC1 | Customer Switch 1/OAM,Signaling Network |
| 2 | rms1 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 3 | rms1 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 2 | | |
| 4 | rms2 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 5 | rms2 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 6 | rms2 iLO | Customer Switch 2/OAM Network |
| Rack Mount Server 3 | | |
| 7 | rms3 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 8 | rms3 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 9 | rms3 iLO | Customer Switch 1/OAM Network |

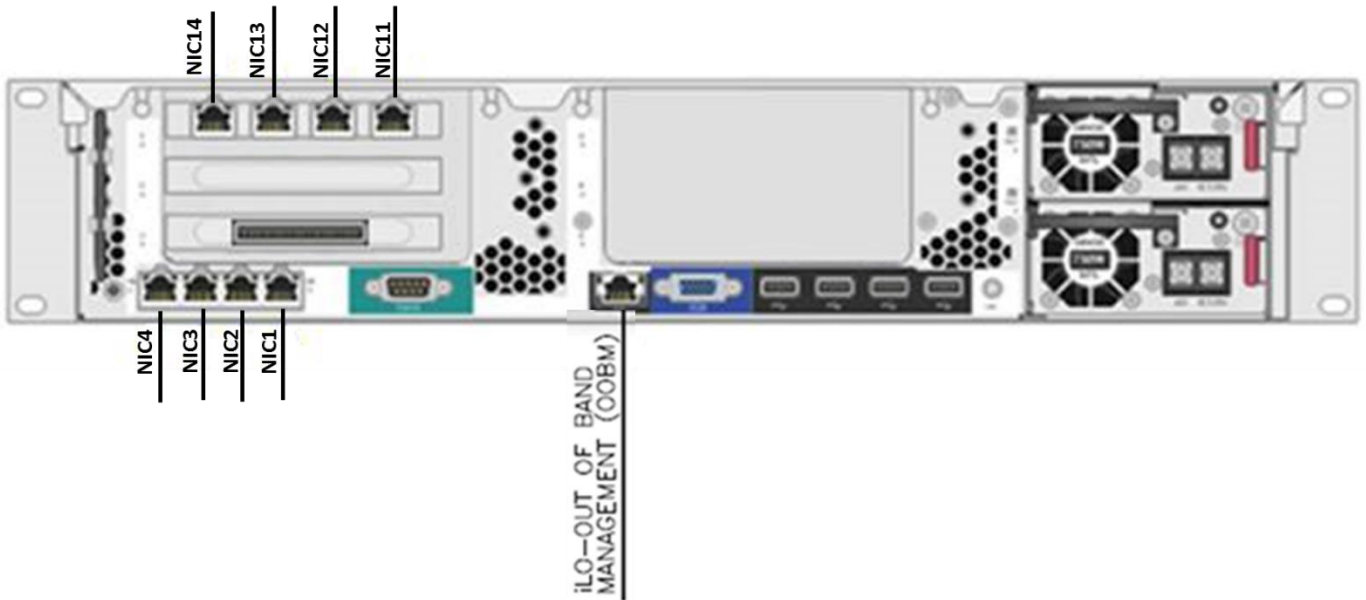
| Item # | Port (to) | Port (from) |
|---------------------|-----------|---|
| Rack Mount Server 4 | | |
| 10 | rms4 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 11 | rms4 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 12 | rms4 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 5 | | |
| 13 | rms5 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 14 | rms5 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 15 | rms5 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 6 | | |
| 16 | rms6 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 17 | rms6 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 18 | rms6 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 7 | | |
| 19 | rms7 NIC1 | Customer Switch 1/ OAM,Signaling Network |
| 20 | rms7 NIC2 | Customer Switch 2/ OAM,Signaling Network |
| 21 | rms7 iLO | Customer Switch 1/OAM Network |
| Rack Mount Server 8 | | |
| 22 | rms8 NIC1 | Customer Switch 1/ OAM, Signaling Network |
| 23 | rms8 NIC2 | Customer Switch 2/ OAM, Signaling Network |
| 24 | rms8 iLO | Customer Switch 1/OAM Network |

Appendix A. Port Designations

A-1 HP DL380 Gen8 Port Designations

Following figure indicates the port designations of the NICs labelled in Table 1: NIC/Server Type Cross Reference for DL 380 Gen8 servers [5].

Figure 6: HP DL380 Gen8 Port Designations



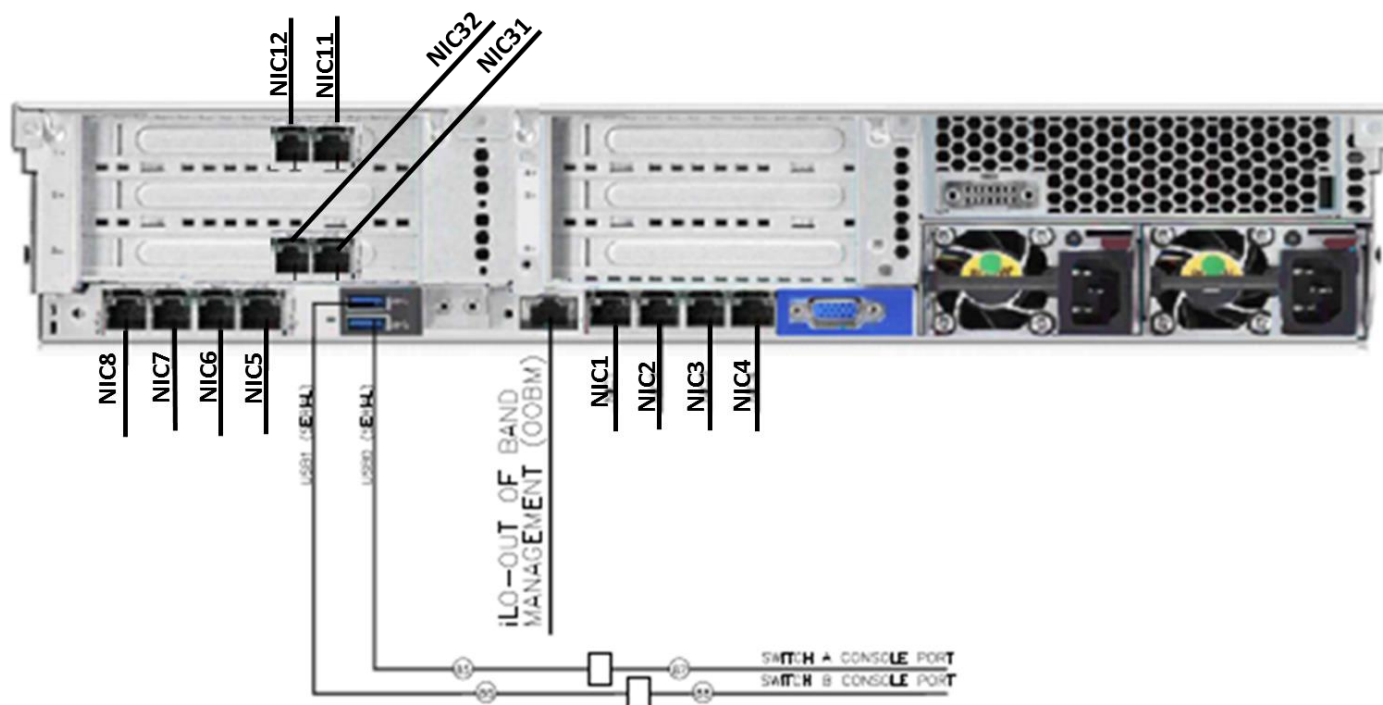
Note:

- NIC1 to NIC4 are HP FlexLOM 1Gb 4-port 331FLR Ethernet Adapter
- NIC11 to NIC14 are 10 Gigabit PCI cards in Slot-1.

A-2 HP DL380 Gen9 Port Designations

Following figure indicates the port designations of the NICs labelled in Table 1: NIC/Server Type Cross Reference for DL 380 Gen9 servers [6].

Figure 7: HP DL380 Gen9 Port Designations



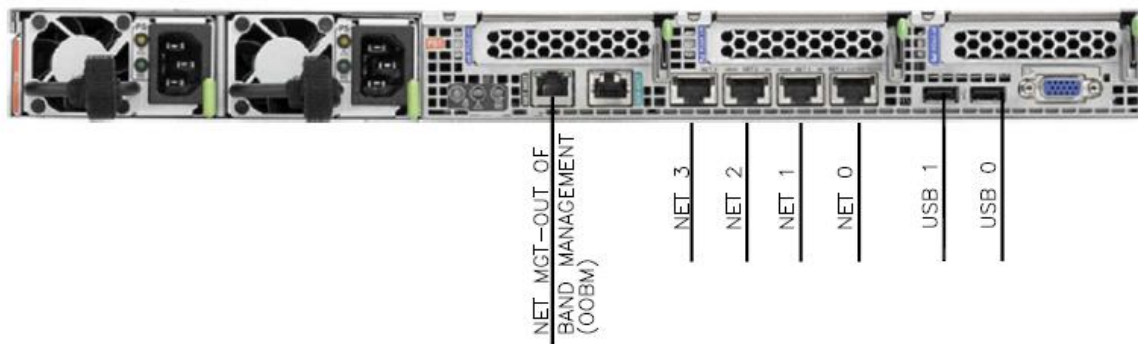
Notes:

- NIC(1-4) only support 1Gigabit. They are not used right now.
- One 2-port 10-Gigabit Flexible LOM card(s) are required. This shall be used for Management traffic for Segregated signaling topology and shall be used for both Management and Signaling traffic for Non-segregated signaling topology.
- 1 additional 2 port 10 Gigabit PCI cards is required while running the segregated signaling (either SLOT-1 i.e. NIC 11 and NIC12 or SLOT-3 i.e. NIC31 and NIC32 shown above).

A-3 Oracle X5-2 / X6-2 Config-0 and CONFIG-1 Port Designations

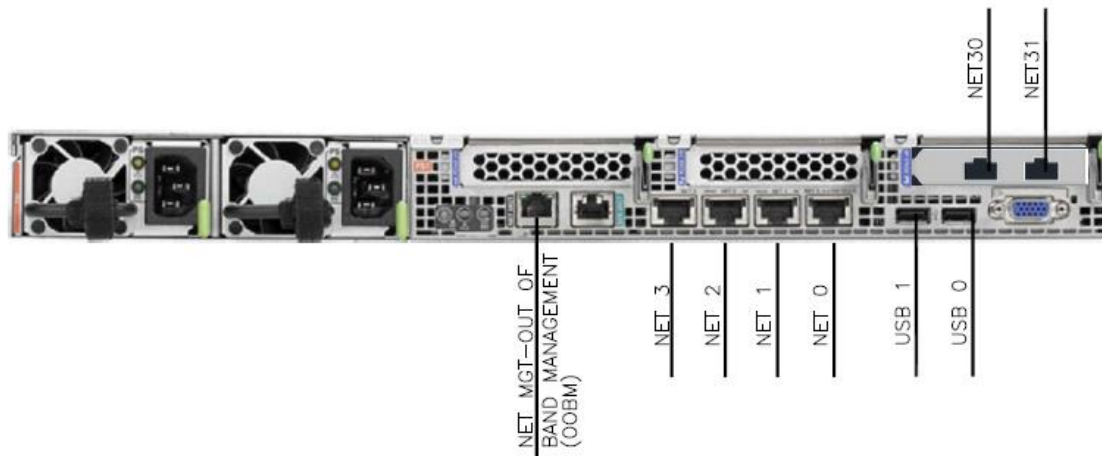
Following figure indicates the port designations of the NICs labelled in Table 1: NIC/Server Type Cross Reference for Oracle X5-2 [1] and Oracle X6-2 [3] servers:

Figure 8: Oracle X5-2 / X6-2 Config 0 Port Designations



DETAIL PP – ORACLE SERVER X5-2/X6-2
CONFIG 0 PORT DESIGNATIONS

Figure 9: Oracle X5-2 / X6-2 Config 1 Port Designations



DETAIL RR – ORACLE SERVER X5-2/X6-2
CONFIG 1 PORT DESIGNATIONS

Notes:

- Rear view of Oracle X5-2 and X6-2 server(s) are almost identical. Therefore we have only referred NIC the labelling as per Oracle 6-2 server. Same applied for Oracle X5-2 servers as well.
- Ethernet ports NET0 to NET3 are 10G onboard ethernet NICs.
- NET30 and NET31 are on 10G PCI card slots #3.
- Config-0 does not have any provision for Backup network.

A-4 Netra X5-2 Config-0 and Config-1 Port Designations

Following figure indicates the port designations of the NICs labelled in Table 1: NIC/Server Type Cross Reference for Netra X5-2 [2] servers:

Figure 10: Netra X5-2 Config 0 Port Designations

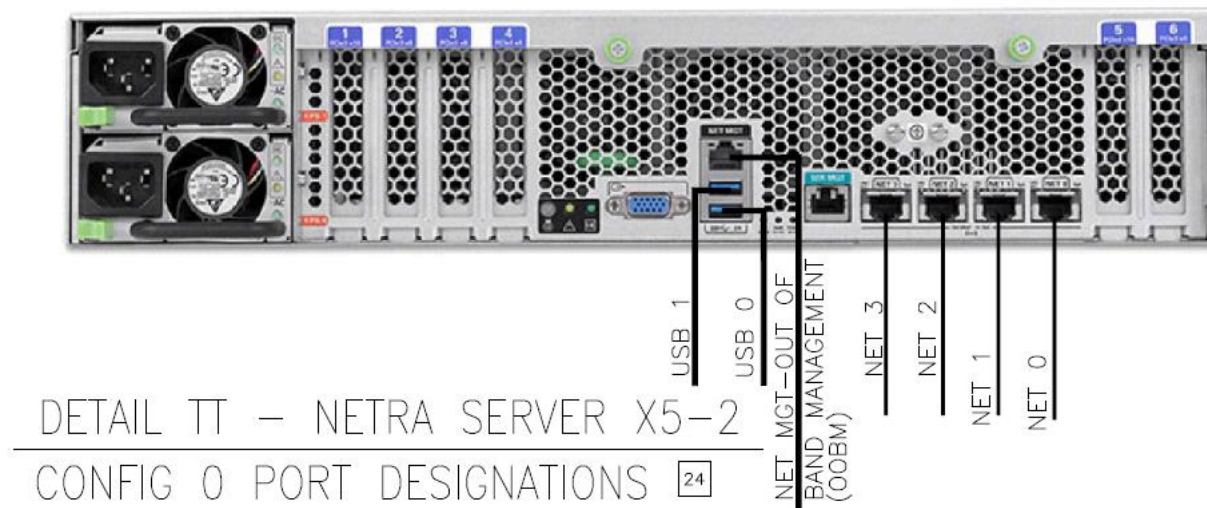
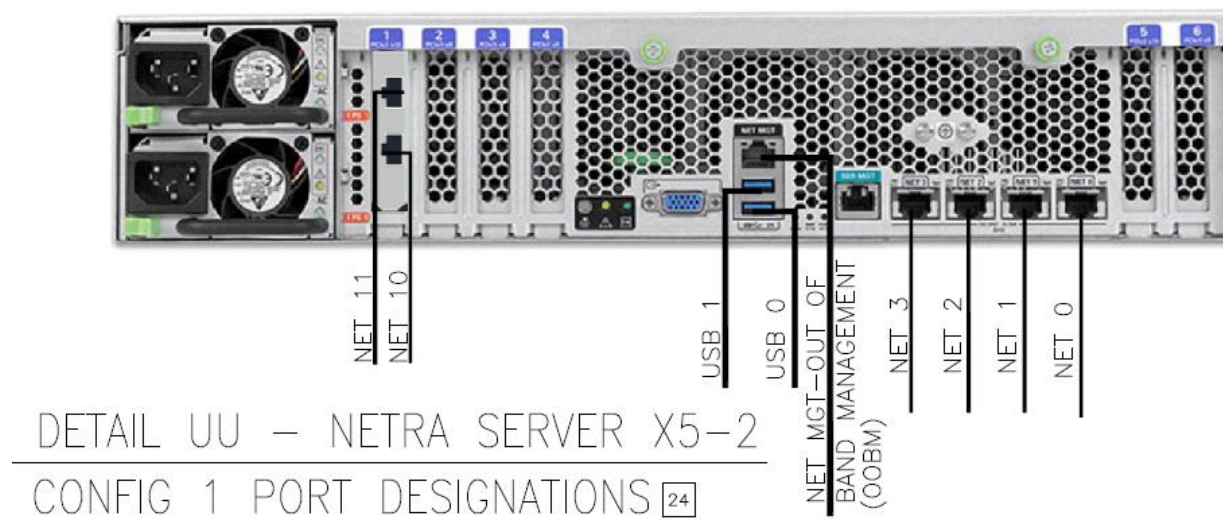


Figure 11: Netra X5-2 Config 1 Port Designations



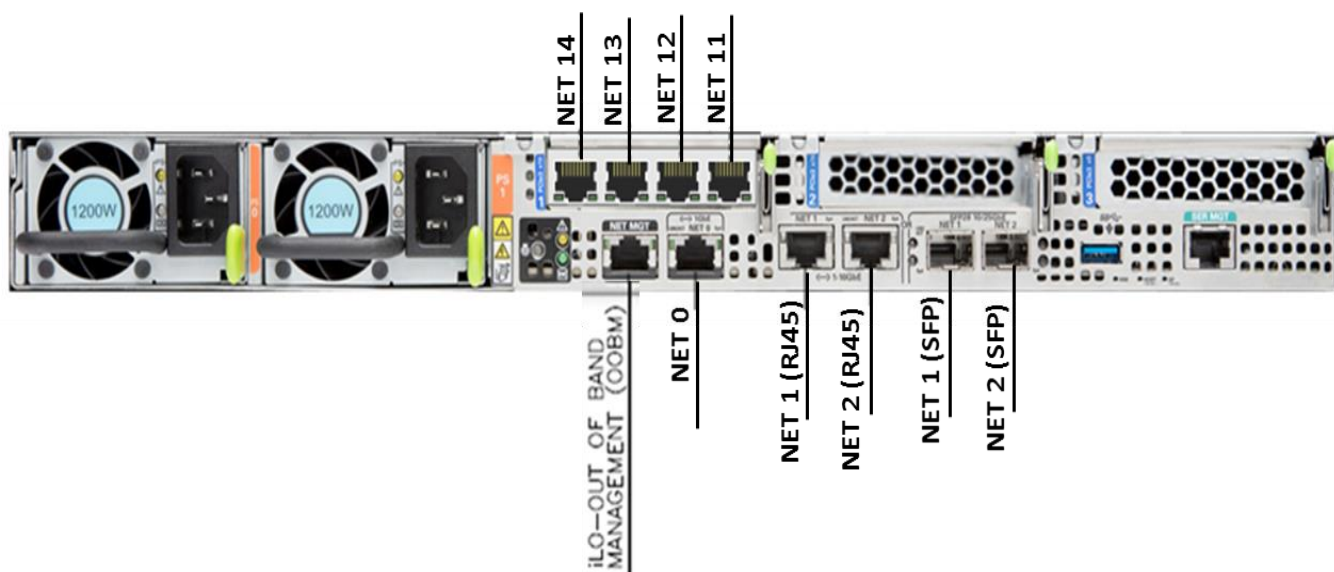
Notes:

- Ethernet ports NET0 to NET3 are 10G onboard ethernet NICs.
- NET10 and NET11 are on 10G PCI card slots #1.
- Config-0 does not have any provision for Backup network.

A-5 Oracle X7-2 10GE-RMS-1 Port Designations

Following figure indicates the port designations of the NICs labelled in Table 1: NIC/Server Type Cross Reference for Oracle X7-2 servers [4]:

Figure 12: Oracle X7-2 10GE-RMS-1 Port Designations



Note:

- Ethernet port NET0 is unused.
- Ethernet ports NET1 and NET2 are 10G each. They are optionally available as RJ45 or SFP (not both).
- NET11 – NET14 are on 10G PCI slot #1.
- Refer to [7] for details on 10GE-RMS-1 topology.