Oracle® Virtual Networking QDR and EDR Host Drivers for Oracle Solaris 11.3 Release Notes

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Oracle Virtual Networking QDR and EDR Host Drivers for Oracle Solaris 11.3 Release Notes

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Contents

Using This Documentation 7
Product Documentation Library 7
Feedback 7

Late-Breaking Information 9
What's New in This Release 9
Minimum System Requirements 9
Supported HCAs 10
System Limitations and Restrictions 10
LACP Is Not Supported 11
Virtual Resources Supported per Oracle Solaris Server 11
Limitations of a vNIC or a vHBA That Is Part of Oracle VM Server for SPARC or Oracle Solaris Zone 11
Naming Guidelines for Oracle Solaris vNICs and vHBAs 11
Connectivity to Commonly Available Brocade FC Switches in Fabric-Port Mode (f-port) 12
Dynamic LUN Discovery Support 12
Installing the Host Drivers 12
Preinstallation Requirements 12
▼ Install the Host Drivers 13
▼ Upgrade the Host Drivers to Support Oracle Solaris 11.3 OS 14
▼ Uninstall the Host Drivers 15
Known Issues 16
HBA LUN Commands 20
HBA API Commands 20
`cfgadm` Commands 21

Using This Documentation

- **Overview** – Provides late-breaking information and known issues for Oracle Virtual Networking host drivers for Oracle Solaris 11.3
- **Audience** – System administrators, authorized service providers, and users who have experience in administering advanced networks
- **Required knowledge** – Advanced experience in using OVN host drivers for Oracle Solaris

Product Documentation Library

Documentation and resources for this product and related products are available at http://www.oracle.com/goto/Oracle-Virtual-Networking/docs.

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Provide feedback about this documentation at http://www.oracle.com/goto/docfeedback.

Late-Breaking Information

These topics provide important and late-breaking information about the Oracle Virtual Networking host drivers release 5.5.0 for Oracle Solaris 11.3 hosts.

These notes contain the following topics:

- "What's New in This Release" on page 9
- "Minimum System Requirements" on page 9
- "System Limitations and Restrictions" on page 10
- "Installing the Host Drivers" on page 12
- "Known Issues" on page 16
- "HBA LUN Commands" on page 20

What's New in This Release

- Starting with Oracle Solaris 11.3, Oracle Virtual Networking host drivers are integrated into the Oracle Solaris 11.3 package.

  Note - Oracle Solaris 11.3 hosts running Oracle Virtual Networking can support only the local boot method. The other boot methods such as SAN boot, iSCSI boot, and PXE boot are not supported.

- The host drivers for Oracle Solaris 11.3 support private virtual interface (PVI) vNIC functionality of Oracle SDN. This support enables high-speed server-to-server connections for east-west traffic. Because the PVI functionality is embedded in the host driver package, there is no need for additional software.
- The host drivers also support HBA LUN commands. For more information, see "HBA LUN Commands" on page 20.

Minimum System Requirements

These are the minimum versions of the operating systems and technologies required for the Oracle Virtual Networking host driver release 5.5.0.

Operating System or Technology	Minimum Requirement
Oracle Solaris OS (64-bit SPARC-based and x86 platforms)	11.3
XgOS	3.9.2
Oracle VM Server for SPARC	3.0
Oracle VM Server for x86	3.0

Supported HCAs

Oracle Virtual Networking host drivers for Oracle Solaris 11.3 support Oracle HCAs as well as third-party HCAs. All HCAs must use the required version of firmware. Refer to the product notes for each HCA for latest firmware versions.

Supported Oracle HCAs include:

- Sun InfiniBand Dual Port 4x QDR PCIe Low Profile Host Channel Adapter M2. For documentation, refer to `http://docs.oracle.com/cd/E19241-01/index.html`.
- Sun InfiniBand Dual Port 4x QDR PCIe ExpressModule Host Channel Adapter M2. For documentation, refer to `http://docs.oracle.com/cd/E19157-01/index.html`.
- Oracle Dual Port QDR InfiniBand Adapter M3. For documentation, refer to `http://docs.oracle.com/cd/E40985_01/index.html`.

For third-party HCAs, refer the manufacturer's documentation for information about the required firmware version.

System Limitations and Restrictions

These topics document system limitations and restrictions for the Oracle Virtual Networking host drivers in Oracle Solaris 11.3.

- "LACP Is Not Supported" on page 11
- "Virtual Resources Supported per Oracle Solaris Server" on page 11
- "Limitations of a vNIC or a vHBA That Is Part of Oracle VM Server for SPARC or Oracle Solaris Zone" on page 11
- "Naming Guidelines for Oracle Solaris vNICs and vHBAs" on page 11
- "Connectivity to Commonly Available Brocade FC Switches in Fabric-Port Mode (f-port)" on page 12
- "Dynamic LUN Discovery Support" on page 12

LACP Is Not Supported

Link Aggregation Control Protocol (LACP) is not supported in this release of host drivers. If your servers require link aggregation (LAG), you must use static LAGs.

Virtual Resources Supported per Oracle Solaris Server

These are the maximum number of virtual I/O resources of type supported on a Oracle Solaris 11.3 host with a memory of 8 GB.

I/O Resource	Maximum of Type
vNIC	16 vNICs, which can be 8 vNICs and 8 PVI vNICs (standard configuration), 16 vNICs and 0 PVI vNICs, or 0 vNICs and 16 PVI vNICs. **Note -** HA vNICs are not supported from the Oracle Fabric Interconnect. However, server-based HA vNICs are available natively through the IPMP on the Oracle Solaris server.
vHBA	8 standalone vHBAs.

Limitations of a vNIC or a vHBA That Is Part of Oracle VM Server for SPARC or Oracle Solaris Zone

Currently, a vNIC or vHBA cannot be deleted from an Oracle Solaris host if that vNIC or vHBA is part of Oracle VM Server for SPARC or Oracle Solaris zone. To delete such vNIC or vHBA, you must first disassociate the vNIC or vHBA from Oracle VM Server for SPARC or Oracle Solaris zone, and then delete the vNIC or vHBA.

Naming Guidelines for Oracle Solaris vNICs and vHBAs

The vNIC and vHBA must have different names.

In the Oracle Solaris OS, the names of virtual resources are restricted to the following lengths:

- vNICs: 10 characters
- vHBAs: 15 characters
- Server profiles: 31 characters

With the Oracle Solaris OS, you must use the standard notation to name vNICs and vHBAs such as the following:

- *vnic-name.server-profilex*
- *vhba-name.server-profilex*

Replace *x* with a numeral at the end of a vNIC and vHBA name so that the vNIC and vHBA receive correctly enumerated instance numbers. There are no special numerals in the vNIC or vHBA name string (for example, 0 is not reserved). You can use any number of numerals in the vNIC and vHBA strings, as long as the entire name string complies with the name length limitation.

Some examples of acceptable vNIC and vHBA names:

- `vnic0.profile1, vnic01.profile1, vnic001.profile1`
- `vhba1.profile1, vhba123.profile1, vhba987.profile1`
- `oracle2.profile1, webapps9.profile1, backups3.profile1`

Connectivity to Commonly Available Brocade FC Switches in Fabric-Port Mode (f-port)

N_Port ID virtualization (NPIV) login must be enabled on the FC switch.

Dynamic LUN Discovery Support

Dynamic logical unit number (LUN) discovery is supported in situations when no LUN masking is present and either a registered state change notification (RSCN) message is sent from the storage target, or a user-initiated rescan occurs on the vHBA.

Installing the Host Drivers

These topics describe how to install the host drivers. Starting with Oracle Solaris 11.3, the host drivers are integrated with the Oracle Solaris OS.

Preinstallation Requirements

- See “Minimum System Requirements” on page 9 for system requirements.
- The Oracle Solaris hosts must have at least one dual-port Oracle ConnectX2 QDR HCA.
- The minimum required version of the firmware must be running the HCA installed on the host. See “Supported HCAs” on page 10.

- You must have root user privileges for the Oracle Solaris host.

▼ Install the Host Drivers

1. **Set the publisher to the Oracle Solaris repository.**

2. **Install the `ovn-virtual-io` package.**

```
root@netra:~# pkg install ovn-virtual-io
            Packages to install:   1
             Services to change:   2
       Create boot environment:  No
 Create backup boot environment: Yes


 DOWNLOAD                                  PKGS         FILES     XFER (MB)    SPEED
 Completed                                  1/1        12/12       0.3/0.3     0B/s

 PHASE                                        ITEMS
Installing new actions                       45/45
Updating package state database               Done
Updating package cache                         0/0
Updating image state                          Done
Creating fast lookup database                 Done
Updating package cache                         4/4
```

3. **Verify that the service is available.**

```
root@netra:~# svcs -a | grep ovn-virtual
online         12:51:06 svc:/system/devices/ovn-virtual-io:default
```

4. **Reboot the server.**

   The server is visible on the Oracle Virtual Networking chassis.

5. **(For servers running Veritas DMP) Edit the `/etc/system` file.**

   - **For Veritas DMP running on SPARC T5 or SPARC M5 series servers:**

     a. **Open the `/etc/system` file for editing.**

     b. **Before the Veritas `vxvm` entry, add the following line:**

        ```
        forceload:drv/ib
        ```

     c. **Save and close `/etc/system`.**

d. **Reboot the server.**

- **For Veritas DMP running on EMC:**

  a. **In the `/etc/system` file, find the ZFS lines, and add the following:**

     ```
     set zfs:zfs_vdev_enable_mvector=0
     ```

  b. **Save and close `/etc/system`.**

  c. **Reboot the server.**

After the packages are added, you can configure vNICs and vHBAs. Refer to the *Oracle Virtual Networking XgOS User's Guide*.

Upgrade the Host Drivers to Support Oracle Solaris 11.3 OS

When you upgrade your host from Oracle Solaris 11.2 to Oracle Solaris 11.3, you must uninstall the existing host drivers and then reinstall them.

1. **Review the information in "Preinstallation Requirements" on page 12.**

2. **Halt all network and storage traffic.**

   For example, set the interfaces to down state, and wait for network and storage traffic to quiesce.

3. **Unset the publisher by using the `pkg unset-publisher` command and specifying the directory where the host driver file exists.**

   ```
   root@netra:~# pkg unset-publisher /usr/ORCLovn
   ```

   where *usr* is the user-defined location.

4. **Remove the currently installed host drivers by using the `pkg uninstall` command and specifying the host driver file name.**

   ```
   root@netra:~# pkg uninstall ORCLovn-drv
   ```

5. **Reboot the Oracle Solaris server to clear the host drivers from memory.**

6. **Set the Oracle Solaris publisher to point to the new Oracle Solaris OS image packaging system (IPS) repository for updating.**

```
root@netra:~# pkg set-publisher -g http://pkg.oracle.com/solaris/release
```

7. **Update the system to the new version of the Oracle Solaris 11.3 OS.**

```
root@netra:~# pkg update --accept
```

8. **Reboot the Oracle Solaris host.**

9. **Install the host drivers.**

See "Installing the Host Drivers" on page 12.

Uninstall the Host Drivers

You can remove the Oracle Virtual Networking host drivers in Oracle Solaris 11.3 OS by uninstalling them.

1. **Uninstall the drivers from the server.**

```
root@netra:~# pkg uninstall ovn-virtual-io
            Packages to remove:    1
      Create boot environment:  Yes
Create backup boot environment:   No

PHASE                                        ITEMS
Removing old actions                         32/32
Updating package state database               Done
Updating package cache                         1/1
Updating image state                          Done
Creating fast lookup database                 Done
Updating package cache                         4/4


A clone of sol_83_2 exists and has been updated and activated.
On the next boot the Boot Environment sol_83_2-1 will be
mounted on '/'. Reboot when ready to switch to this updated BE.

Updating package cache                         4/4
```

A new boot environment is created. After reboot the server will be booted into the new BE.

2. **Ensure that the service is not present after reboot.**

```
root@netra:~# svcs -a | grep ovn-virtual
root@netra:~#
```

Known Issues

These are the known issues in this release of the host driver.

Bug ID	Description
19571359	**Pillar- Zpool is Suspended on Various I/Os Failover or Failback Tests** On an Oracle Virtual Networking chassis running two servers, the I/O failover or failback does not work on the Pillar storage but works on the ZFS, Netapp, and 3PAR storages. This bug is not an Oracle Virtual Networking bug. **Workaround:** None.
20443969	**PVI Multicast Join or Attach Fails** When a PVI is created on a Linux host first and then on an Oracle Solaris host, the host fails to be multicast-capable. This is because the default MTU of the Hermon driver is set to 2000. **Workaround:** You must first create the PVI on the Oracle Solaris host.
17490439	**Failed to Detect LUN 0 When MPXIO Is Enabled From the Host** After the vHBA is created, Oracle Solaris 11.3 hosts fail to detect LUN 0 when LUN 0 is added to a vHBA. This is a SCSAv3 layer bug. **Workaround:** LUN 0, which is the controller LUN, should always be mapped to the vHBA manually.
20419596	**No TCP Traffic to Oracle VM Server for SPARC on a Checksum-Enabled Jumbo PVI** When checksum-enabled vNICs or PVI vNICs are pushed to Oracle VM Server for SPARC that has connectivity with Oracle Solaris 11.3 hosts, there will be no TCP traffic if the vNIC or vSwitch in the Oracle VM Server for SPARC has a non-zero checksum value configured. This is not an Oracle Virtual Networking issue. The same vNIC works fine in the primary domain. By default, checksum is not enabled on a vNIC and hence works fine. **Workaround:** None.
19516042	**Zpool Goes Into Unavailable Mode After Host Reboot** During the boot process, Zpool goes into a faulty state when all the vHBAs are yet to be online. Zpools come online after FMA becomes operative. However the faulty state affects the zones. This is not an Oracle Virtual Networking issue. **Workaround:** Use the following command to bring the Zpool online: `zpool clear` *zpool-name*.
20461377	`xsvnic`**Must Know the Device State After Install** There might be an obstruction to `xsvnic`'s DR when the port is open for querying the link state. This is because the link state details are updated only when the `mc_start` function is called. **Workaround:** None.

Bug ID	Description
20461341	**Package Uninstallation Fails to Clean up `xstn` Module From the `ib.conf` File** Because of the unavailability of the `post remove` option in IPS, during installation, the Oracle Virtual Networking service `start` method tries to update the `ib-conf` file by using the `cfgadm_ib` command. This issue does not have any impact as `xstn` module and other Oracle Virtual Networking modules are removed after uninstallation. **Workaround:** None.
19054744	**TCP Responses on an Aggregation Interface Can Sometimes Be Prohibited** Some tools and utilities force a vNIC or PVI vNIC into promiscuous mode. On an Oracle Solaris interface that is aggregating (for example, trunking) PVI vNICs that have checksumming enabled, a problem can prevent a response to TCP packets sent over the interface. This problem occurs because the tool forces the vNIC or PVI vNIC into promiscuous mode. **Workaround:** None.
18963387	**Secondary I/O Domain Attached to Multipath Group Disk Does Not Complete Reboot** With two I/O domains attached to two virtual disks as a multipath group (one domain per disk), the secondary I/O domain can get "stuck" during the bootup sequence when an Oracle Solaris 11.3 host is rebooted. When the secondary I/O domain is "stuck," it does not complete its reboot and never comes back online. **Workaround:** Edit the `/etc/system` file for all I/O domains connected to the Oracle Solaris host to include the following: `firceload: drv/PX`
18877148	**Problem When Setting an Oracle Virtual Networking Server Profile Down** An internal logic-handling error in the Oracle Solaris SCSAv3 code can cause a kernel panic in Oracle Solaris 11.3 hosts when you attempt to set a server profile to down state. **Workaround:** None.
18086995	**The `ipadm delete-ip` Operation Pushes vNIC to Up/Down State in Chassis** For vNICs or PVI vNICs that are added from the Oracle Fabric Interconnect, if you issue the `ipadm delete-ip` command on an Oracle Solaris 11.3 host to remove the network address for a vNIC, a problem sets the vNIC to up/down state on the Oracle Fabric Interconnect. This problem affects standard vNICs and PVI vNICs. **Workaround:** You can work around this problem by assigning the IP address from the host.
18046241	**vNIC Host Managed IP Address for vNIC Is Not Displayed on Chassis** If you configure a vNIC, then attempt to assign the vNIC's IP address as a host-managed address, the IP address is visible on the host. However, a problem prevents the address from being displayed on the Oracle Fabric Interconnect when you issue the show `vnic` command. **Workaround:** None.
18046181	**Do Not Allow Duplicate PVIs With the Same Net ID**

Bug ID	Description
	A problem allows duplicate PVUs to be created with the same Net ID. This is incorrect, as each PVI should have its own unique Net ID. **Workaround:** None.
18046171	**No Traffic between Access vNIC and Host Managed on Trunk vNIC** An access-mode PVI connected to one Oracle Solaris 11.3 host and a trunk PVI connected to a different Oracle Solaris 11.3 host cannot pass traffic through the same VLAN when both PVIs are connected to the same cloud. **Workaround:** None.
18018632	**PVI Cloud vNICs Remained in `Up/Initializing` After Server Profile Disconnect/ Reconnect** When two servers have 16 vNICs and 16 PVIs configured across them (8 vNICs and 8 PVIs on each server), and traffic is occurring on all 16 vNICs, if the server profile is disconnected and reconnected, the PVIs might not come back up. Instead, a problem causes them to remain in up/initializing state. This problem is seen only on the PVIs. The standard vNICs come back online correctly after the server profile is connected. **Workaround:** If you encounter this problem, you can work around the PVI problem by setting the PVIs down, then up.
17940487	**PVI Loss in ICMP Packets When Host Comes Up After Reboot** When a host is rebooted and the PVI is coming up on the host and the Oracle Fabric Interconnect, ICMP packet loss occurs during pings, but only for a short time. ICMP packet loss goes from 100% on the first ping session to 0% packet loss by the third ping session. **Workaround:** None.
17927174	**Data-Link Manager Failed to Add a vNIC Device** On an Oracle Solaris server that has a full 16 vNICs (8 standard vNICs and 8 PVI vNICs), a problem can prevent all vNICs from being displayed by data-link management processes. When the problem occurs, all vNICs are shown by other processes, but data-link management misses one vNIC. For example, `prtconf -D` correctly shows all 16 vNICs, but `dladm show-phys` shows only 15 vNICs. **Workaround:** None.
17877733	**PVI vNIC and Clouds Statistics Are Not Incremented** In an HA Oracle Fabric Interconnect deployment (where multiple servers are redundantly connected to two Oracle Fabric Interconnects), statistics for PVI vNICs and PVI clouds are not incrementing. This problem causes the following commands to show zero: ■ `show pvi` *pvi-name* `throughput` ■ `show pvi` *pvi-name* `throughput` ■ `show vnic` *pvi-name* `stats` **Workaround:** None.
17487287	**System Crashes When vHBAs and vNICs Removed at Once** A problem can cause Oracle Solaris 11.3 hosts to crash in some situations while vHBAs are being deleted. This problem occurs if you delete multiple vHBAs and immediately attempt to delete vNICs while the vHBA deletion process is still ongoing. Also, this

Bug ID	Description
	problem can occur when you issue the `format` command on the host while the vHBA deletion process is still ongoing. **Workaround:** ■ Delete vNICs before deleting vHBAs, or if you need to delete vHBA first, wait until all vHBAs have been completely deleted before starting to delete vNICs. ■ Do not run the `format` command on the host while vHBAs are being deleted.
17370928	**LUN Masking Is Not Working to Show a Mask of LUNs Behind a Target** In this release, LUN masking is not supported from the Oracle Fabric Interconnect. Do not use the LUN mask feature from the Oracle Fabric Interconnect because it will not properly mask, and all LUNs will be visible. **Workaround:** Configure any LUN masking from the storage target.
17337836	**Stale Entries getting Created in the `/dev/` Directory** When LUNs and targets are dynamically added or deleted, entries are written to the `/dev` directory. However, a problem prevents the proper cleanup of these entries, and as a result, stale entries can accumulate in `/dev`. When enough entries have accumulated, issuing the `format` command hangs. **Workaround:** Periodically, manually clean up the entries in `/dev`. Issue the following command: `devfsadm -Cv`
17254225	**LUN 0 Must Always Be Mapped to the vHBA for SCSAv3** Per SCSAv3, LUN 0 (zero) is required and should be mapped to vHBAs for correct reporting. However, the host drivers do not check or enforce this requirement, so it is possible that LUN 0 is not mapped to the vHBAs. If LUN 0 is not mapped to vHBAs, inconsistencies can occur on those vHBAs. **Workaround:** Make sure that LUN 0 is mapped to vHBAs.
17234437	**LUN Not Visible in`format` Command From NetApp Storage** A problem prevents LUNs on NetApp storage from being visible when issuing the format command on an Oracle Solaris 11.3 host. **Workaround:** You can work around this problem by adding lines to the `scsi_vhci.conf` file on the Oracle Solaris host. Follow this procedure: 1. Log in to the Oracle Solaris 11.3 host, and using `vi, emacs, geddit,` ot any standard text editor, open the `/kernel/drv/scs_vhci.conf` file for editing. 2. Find the `scsi-vhci-failover-override =` statement and add the following NetApp line: **`"NETAPP LUN", "f_sym"`**
165306626	**Change the LUN Mask Not Detaching the Old LUN Mask's LUN** In a LUN mask assigned to an Oracle Solaris host, the original LUNs remain masked even if the configuration of the LUN mask has been changed. If you edit the LUN mask, the changes do not take effect. For example, if you create a LUN mask with two LUNs, then remove those LUNs and add two more, the LUN mask will incorrectly contain four

Bug ID	Description
	LUNs (the two newly added LUNs, plus the two LUNs from the original LUN mask). This problem occurs even after rescanning the vHBA. Because LUN masking is not assigned dynamically, you must set the vHBA down, then up. **Workaround:** Do the following when you make any changes to a LUN mask that is already created: 1. Set the vHBA down: **`set vhba`** *name.server-profile-name* **`down`** 2. Set the vHBA up again: **`set vhba`** *name.server-profile-name* **`up`**

16338290	**Error Seen in `dmesg`on vNIC Creation and Deletion**
	
	When adding or deleting a vNIC interface, spurious messages are displayed on the Oracle Solaris host. Be aware that messages are displayed, but they are not always errors. You need to scan the messages to determine if an actual error exists. For example, the following messages are actual errors:
	
	`@ Jan 25 10:17:29 sparc1-prb nwamd[756]: [ID 588122 daemon.error]`
	`1:@ nwamd_set_unset_link_properties: dladm_set_linkprop(mtu)`
	`failed for net25:@ operation not supported`
	
	`@ Jan 25 10:17:29 sparc1-prb nwamd[756]: [ID 387169  daemon.error]`
	`1:@ nwamd_unconfigure_interface: disable failed for net25:`
	`Operation  failed`
	
	Workaround: No workaround currently exists for this problem.

HBA LUN Commands

The Oracle Virtual Networking host drivers support the following `cfgadmin` and `hbaapi` commands from the HBA API.

HBA API Commands

These `fcinfo` and `fcadm` commands are supported.

Command	Short Description
`fcinfo lu`	Displays Fibre Channel information for LUNs.

Command	Short Description
fcinfo lu -v	Displays Fibre Channel information in verbose mode for LUNs.
fcinfo hba-port *port-wwn [port- wwn ...]*	Displays Fibre Channel information for one or more HBA ports.
fcinfo remote-port -p*port-wwn*	Displays Fibre Channel information for a specific storage port on a peer device.
fcinfo remote-port -p *port-wwn* **-s**	Displays Fibre Channel information for a specified storage port on a peer device.
fcadm lu	Displays Fibre Channel administrative information for LUNs.
fcadm lu -v	Displays Fibre Channel administrative information in verbose mode for LUNs.
fcadm hba-port *vhba-wwn*	Displays Fibre Channel administrative information for a specified HBA port.
fcadm remote-port -p *vhba-wwn*	Displays Fibre Channel administrative information for a specified HBA port.

`cfgadm` Commands

These **`cfgadm`** commands are supported.

Command	Short Description
cfgadm -al	Displays the address list for LUN.
cfgadm -c configures	Configures administrative state for a LUN.
cfgadm -c unconfigure	Unconfigures administrative state for a LUN.
cfgadm -c connect	Connects an HBA port in administrative state.
cfgadm -c disconnect	Disconnects an HBA port and sets the administrative state.