Oracle® Virtual Networking for Oracle Solaris Hosts Installation and Boot Guide

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Using This Documentation

- **Overview** – Describes how to configure an Oracle Solaris host using Oracle Virtual Networking host drivers.
- **Audience** – System administrators and authorized service providers.
- **Required knowledge** – Advanced experience managing heterogeneous networks.

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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Preparing for Host Driver Configuration

This document describes how to configure your Oracle Solaris hosts to load host drivers at boot time after you set up and configure the Oracle Fabric Interconnect. You can use only the local boot method as iSCSI, SAN, and PXE boot protocols are not supported by the Oracle Solaris hosts.

These topics provide information about preparing to configure your Oracle Solaris host drivers:

- "Understanding Oracle Solaris Software Tools" on page 9
- "Supported Oracle Solaris Distributions" on page 11
- "HCA Firmware Upgrades" on page 12

Related Information

- "Configuring Oracle Solaris Host Drivers" on page 15

Understanding Oracle Solaris Software Tools

Oracle Virtual Networking supports a host software stack to be installed on supported Oracle Solaris servers running on the x86 and SPARC platforms. The software is a collection of custom kernel modules, services and host drivers. The combination of these elements is bundled into a single package executable by the root user on the Oracle Solaris server. The package contains the InfiniBand stack, the host drivers, kernel modules, and so on.

These topics provide an overview of the host software package:

- "IPS Package" on page 10
- "IPS Package Commands" on page 11

When the package is installed, it contains additional tools which are installed automatically. You do not need to manually install these tools. The following table describes these additional tools.

Tools	Description
xsadmd	Processes internal messages, user land inputs, and calls appropriate Oracle Solaris utilities as needed.
xstl	Processes internal messages, user land inputs, and calls appropriate Oracle Solaris utilities as needed.
xstn	The transport-layer driver. Binds to each physical IB port available in the server by being a virtual-port service driver (IB-VPPA) in the Oracle Solaris IB framework.
xsvnic	The vNIC module. Provides virtual NIC services.
xsvhba	The vHBA module. Provides virtual HBA services.

Related Information

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IPS Package

The Oracle Solaris host drivers are distributed in the IPS format. This format provides a single package for each architecture (either SPARC or x86) that contains all the required files. Installing the IPS format is similar to using an RPM, but there are some syntax differences in the commands used with IPS packages. IPS packages have the following naming conventions.
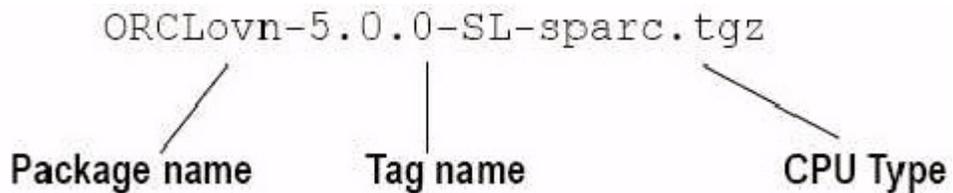
Because the Oracle Solaris host drivers support both SPARC and x86 servers, two packages exist (one for each CPU type):

- ORCLovn-5.0.0-SL-sparc.tgz is for SPARC-based servers
- ORCLovn-5.0.0-SL-i386.tgz is for x86-based servers

You need to get the correct type for your servers. After unzipping the .tgz file, the IPS package is visible. You need to install the IPS package.

Caution - If you attempt to install the wrong host drivers for the server's CPU type, there is no validation checking to warn you of the mismatch between the host driver type and the CPU type. However, when you start to install the host drivers and they are incompatible with the CPU type, the host drivers will not actually install. This error is a silent failure, so there is no way to determine that you've hit this issue. Make sure that you install the correct driver type for your server's architecture.

IPS Package Commands

IPS packages are conceptually similar to packages, but IPS packages use a different command syntax for installation and management. You can get a full list of IPS package commands by issuing the `ips --help` command. The following list shows some common IPS package commands.

```
pkg set-publisher -p IPS-name
pkgrepo -s IPS-name -list
pkg contents path-to-IPS
pkg install path-to-IPS
pkg update path-to-IPS
pkg remove path-to-IPS
pkg unset-publisher IPS-name
```

For information about installing IPS packages, see "Install Host Drivers for Oracle Solaris 11.1 or Oracle Solaris 11.2" on page 16.

Supported Oracle Solaris Distributions

The Oracle Fabric Interconnect supports generally available host software for the following Oracle Solaris distributions on SPARC and x86 platforms:

- Oracle Solaris 11.1
- Oracle Solaris 11.2
- Oracle Solaris 11.3

Note - The host drivers are integrated into the kernel from Oracle Solaris 11.3 onwards.

Note - Oracle Solaris hosts are supported on servers with single-port or dual-port ConnectX-2 QDR HCAs only. The HCAs must be running the supported minimum firmware revision level. For more information, see the release notes that accompany the release.

Be aware that even though i386 typically indicates support for both a 32-bit and 64-bit build, the host drivers are actually built as a 64-bit package. Only 64-bit Oracle Solaris platforms are supported.

These topics provide an overview of the two methods of installation supported by the Oracle Virtual Networking host drivers for Oracle Solaris.

- "Web Repository" on page 12
- "Local Repository" on page 12

The choice of web or local repository depends on your deployment, department policies, and so on.

Related information

- "Installing Host Drivers" on page 15

Web Repository

Web repository is the location where the published driver package is available through a URL that points to a central server that contains a single image of the latest host drivers. With this method, multiple servers can point to the URL of the web repository, and install the host drivers over the network.

Local Repository

Local repository is the location where the published driver package is placed directly on the Oracle Solaris server's boot device. The host drivers are installed locally from the boot device.

HCA Firmware Upgrades

There are many types of HCA cards, and each has its own firmware version. In most cases, the firmware version is different for single port and dual port cards. By default, the host HCA's firmware and option ROM are not upgraded during a host driver IPS install.

The Oracle Solaris package does not contain any firmware file. You can get the corresponding version of firmware (if needed) by contacting Oracle Support. After the correct firmware file is

downloaded, you can upgrade the HCA firmware natively through the native HCA upgrade tool on each server.

You can upgrade the HCAs through the `fwflash` tool on the Oracle Solaris host. In addition to upgrading the HCA firmware, `fwflash` also enables you to query the HCA for available device information. The `fwflash` tool is available in the Oracle host drivers package. After the host drivers are installed, `fwflash` is in the `/opt/orclovn/bin` directory.

Related Information

- "Understanding Oracle Solaris Software Tools" on page 9
- "Installing Host Drivers" on page 15

Install Considerations

Consider the following issues when installing and programming multiple bootable HCAs:

- Memory for loading the option ROM from multiple PCI devices is limited. In some cases, memory depletion might be an issue.
- Different devices and vendors consume different amounts of option ROM space.
- The following adapters can contribute to memory depletion: VGA adapter, SAS or RAID controller, NIC(s), and HCA(s).
- There is a possibility that the BIOS will report an error on certain server models indicating the inability to load the option ROM of some devices.
- Consider using dual port HCA(s) for high availability configurations instead of two single port HCA(s). If enabling two single port HCA(s) is still preferred, it might be necessary to disable the option ROM on some of the other devices in the server (or the HCA devices themselves).

Configuring Oracle Solaris Host Drivers

This section documents how to install the host drivers package for both Oracle Solaris SPARC and x86 servers. Both architectures can make use of the IPS commands documented in this chapter.

During installation, the Oracle Solaris host drivers post many errors to the management console in real-time. As a result, there are no post-install log files that you need to check, and there are no post-install scripts you need to run to clean up after the installation is complete.

These topics describe the procedure to install the host drivers.

- "Installing Host Drivers" on page 15
- "Upgrading the Host Drivers" on page 21
- "Uninstalling the Host Drivers" on page 26

Related Information

- "Preparing for Host Driver Configuration" on page 9
- "Debug Tool: `xsigo-support`" on page 28

Installing Host Drivers

Before installing the host drivers, you need to install the supported Oracle Solaris OS on the server and you must have root permissions to install the host drivers. After the host driver installation, booting the server is not required as the drivers are immediately loaded into memory.

Note - Starting with Oracle Solaris 11.3, the host drivers are integrated into the kernel. Therefore, the procedure for installing the host drivers for Oracle Solaris 11.3 host varies from the other Oracle Solaris releases. For information, see "Install Host Drivers for Oracle Solaris 11.3" on page 19.

These topics describe the process of uninstalling the host drivers.

- "Upgrading the Host Drivers" on page 21

-

Related Information

-

▼ Install Host Drivers for Oracle Solaris 11.1 or Oracle Solaris 11.2

You must first download the host driver package to a server. If you are using a web repository, you need to download to the web repository instead of a local drive on each individual server.

- For SPARC-based servers, `ORCLovn-5.0.0-SL-sparcv9.tgz` is the IPS package.
- For x86-based servers, `ORCLovn-5.0.0-SL.i386.tgz` is the IPS package.

1. **Locate the host software, which is typically on Oracle's eDelivery web site.**

2. **Log in to the Oracle Solaris 11.1 server or the Oracle Solaris 11.2 server as a root user.**

3. **Copy the drivers into the server.**
   If you are using a web repository, then download to a directory on that server.

   Note - Driver packages can be placed anywhere in the file system so that the `package server` user has read access to packages (for example `/usr` or `/oracle`). You must not put the file into `/opt`.

   ---

4. **Untar the TAR ball by using the `tar xvzf` command in the directory where you downloaded the host drivers.**
   This procedure assumes the file was downloaded to the `/usr` directory.

   `tar xvzf ORCLovn-5.0-SL-sparcv.tgz`

   When the package is untarred, the host drivers are contained in the `ORCLovn` directory. The actual file name of the host driver package is `system/io/ORCLovn-drv`. Use `system/io/ORCLovn-drv` when specifying the driver package to upgrade.

5. **Set up the publisher by using the `pkg set-publisher` command and specifying the path to the directory in which the host driver file resides.**
   For example:

   `pkg set-publisher -p /usr/ORCLovn`

6. **Install the host drivers by using the `pkg install` command and specifying the host driver file name.**

   For example:

   ```
   pkg install ORCLovn-drv

   Packages to install: 1
              Create boot environment: No
       Create backup boot environment: Yes
                    Services to change: 1

   DOWNLOAD               PKGS     FILES
   XFER (MB) SPEED
         Completed        1/1      19/19
   1.1/1.1   0B/s

   PHASE                            ITEMS
   Installing new actions           45/45
   Updating package state database   Done
   Updating image state              Done
   Creating fast lookup database     Done
   Reading search index              Done
   Updating search index             1/1
   ```

   > **Note -** In the example, it is assumed that you are installing the host drivers from a local repository. If you are installing the host drivers from a web repository, you can specify the URL for the location of the file. For example, for a server named `drivers` you could use `https://drivers/system/io/ORCLovn-drv` as the URL.

7. **(Optional) Unset the publisher by using the `pkg unset-publisher` command and specifying the directory location where the host driver file is located.**

   For example:

   ```
   pkg unset-publisher /usr/ORCLovn
   ```

8. **Verify that the host drivers are installed by using the `pkg list` command while grepping for `ORCLovn` which is a part of the driver file name.**

   For example:

   ```
   pkg list|grep -i ORCLovn
           system/io/ORCLovn-drv (Oracle)
   0.5.11-0.175.1.0.0.2.726    i--
   ```

9. **Verify that all cabling is complete and correct.**

   If the physical layer connectivity is not functional, the nodes might not come online correctly.

10. **Reboot the server by using any of the following commands:**

- **reboot --rv**
- **shutdown -y -g0 -i6**

11. **Allow the server to completely reboot, log in again as a root user, and confirm that the service is running.**

```
> svcs xsadmd
STATE        STIME   FMRI
online      11:10:35  svc:/application/xsadmd:default
```

12. **Display all the installed software and dependencies by issuing the `modinfo` command and grepping for `xs` to find the installed software components.**

For example:

```
modinfo | grep xs
170 7b246000  66f0 285 1 xstn (Xsigo Transport nexus driver v1)
171 7b24e000 1e060   -  1 xstl (Xsigo Transport services v0.2)
174 7b2a0000  f510 286  1 xsvnic (Xsvnic GLDv3 Driver)
181 7b2b0000 309b0 287  1 xsvhba (Xsigo Virtual HBA)
```

13. **Verify that the attachment points and XSTN nodes are up and running on the Oracle Solaris host.**

- The host's HCA is up and connected.
- The host's IB fabric is running.
- The InfiniBand port link is connected to the Oracle Fabric Interconnect. Oracle Virtual Networking uses the InfiniBand port as a transport medium to the server.
- Related IB services are connected.

The bold text in the following example highlights the HCA and IB functionality that should be verified.

```
> cfgadm -a
Ap_Id                      Type        Receptacle   Occupant     Condition
c2                         scsi-sas    connected    configured   unknown
c2::dsk/c2t6d0             CD-ROM      connected    configured   unknown
c4                         scsi-sas    connected    configured   unknown
c4::w5000cca03c59d0c9,0    disk-path   connected    configured   unknown
c5                         scsi-sas    connected    unconfigured unknown
c6                         scsi-sas    connected    configured   unknown
c6::w5000cca03c59acd9,0    disk-path   connected    configured   unknown
c7                         scsi-sas    connected    unconfigured unknown
hca:21280001CF8382         IB-HCA      connected    configured   ok
ib                         IB-Fabric   connected    configured   ok
ib::21280001CF8383,0,ipib  IB-PORT     connected    configured   ok
ib::21280001CF8383,ffff,xstn IB-VPPA   connected    configured   ok
ib::21280001CF8384,0,ipib  IB-PORT     connected    configured   ok
ib::21280001CF8384,ffff,xstn IB-VPPA   connected    configured   ok
```

```
ib::daplt,0              IB-PSEUDO    connected     configured   ok
ib::eibnx,0              IB-PSEUDO    connected     configured   ok
ib::iser,0               IB-PSEUDO    connected     configured   ok
ib::rdsib,0              IB-PSEUDO    connected     configured   ok
ib::rdsv3,0              IB-PSEUDO    connected     configured   ok
ib::rpcib,0              IB-PSEUDO    connected     configured   ok
ib::sol_umad,0           IB-PSEUDO    connected     configured   ok
ib::sol_uverbs,0         IB-PSEUDO    connected     configured   ok
usb0/1                   unknown      empty         unconfigured ok
usb0/2                   unknown      empty         unconfigured ok
usb0/3                   unknown      empty         unconfigured ok
usb1/1                   unknown      empty         unconfigured ok
usb1/2                   unknown      empty         unconfigured ok
usb2/1                   unknown      empty         unconfigured ok
usb2/2                   usb-hub      connected     configured   ok
usb2/2.1                 unknown      empty         unconfigured ok
usb2/2.2                 unknown      empty         unconfigured ok
usb2/2.3                 usb-hub      connected     configured   ok
usb2/2.3.1               unknown      empty         unconfigured ok
usb2/2.3.2               usb-storage  connected     configured   ok
usb2/2.3.3               unknown      empty         unconfigured ok
usb2/2.4                 usb-device   connected     configured   ok
usb2/3                   unknown      empty         unconfigured ok
usb2/4                   usb-hub      connected     configured   ok
usb2/4.1                 unknown      empty         unconfigured ok
usb2/4.2                 unknown      empty         unconfigured ok
usb2/4.3                 unknown      empty         unconfigured ok
usb2/4.4                 unknown      empty         unconfigured ok
usb2/5                   unknown      empty         unconfigured ok
```

▼ Install Host Drivers for Oracle Solaris 11.3

Before configuring the host drivers, you must determine if the minimum requirements are fulfilled.

- The Oracle Solaris hosts must have at least one dual-port Oracle ConnectX2 QDR HCA.
- The HCA installed in the host must be running the firmware version 2.11.x or more.
- You must have root permissions on the Oracle Solaris host.

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.*

Upgrading the Host Drivers

If you have a previous version of Oracle Virtual Networking host drivers for Oracle Solaris installed on your server, you can upgrade to a newer version by using the `pkg update` command. You need to have root access on the Oracle Solaris server to upgrade the host drivers.

During the upgrade, the Oracle Solaris host drivers post many errors to the management console in real-time. As a result, you do not need to run any log files or post-install scripts to clean up after the upgrade is complete.

Note - Starting with Oracle Solaris 11.3, the host drivers are integrated into the kernel. So, you cannot upgrade the host drivers from Oracle Solaris 11.2. You will have to uninstall the existing host drivers and install the host drivers for Oracle Solaris 11.3. For information, see "Upgrade Host Drivers for Oracle Solaris 11.3" on page 25.

These topics explain how to upgrade your Oracle Solaris host drivers.

- "Upgrade the Host Drivers" on page 21
- "Upgrade Host Drivers for Oracle Solaris 11.3" on page 25

Related Information

- "Installing Host Drivers" on page 15
- "Uninstalling the Host Drivers" on page 26

▼ Upgrade the Host Drivers

To upgrade the host drivers, follow the procedure which assumes an IPS package.

1. **Locate the host software, which is typically on Oracle's eDelivery website.**

2. **Log in to the Oracle Solaris server as a root user.**

3. **Copy the drivers into the server.**

   These packages can go anywhere in the file system (for example, the `root`, `/tmp` or `/oracle`).

   Note - If you are using a web repository, download the files to a directory on that server instead of the local hard drive on each individual server.

   ---

4. Untar the TAR ball by using the `tar xvzf` command in whichever directory contains the file. This procedure assumes that the file was downloaded to the `/usr` directory.

For example:

```
tar xvzf ORCLovn-5.0.0-SL-sparcv9.tgz
```

When the package is untarred, the host drivers are contained in the ORCLovn directory. The actual file name of the host driver package is system/io/ORCLovn-drv. Use system/io/ORCLovn-drv when specifying the driver package to upgrade.

5. Set up the publisher by using the `pkg set-publisher` command and specifying the path to the directory in which the host driver file resides.

For example:

```
pkg set-publisher -p/usr/ORCLovn
```

6. Upgrade the host drivers by using the `pkg update` command and specifying the host driver file name.

For example:

```
pkg update /usr/ORCLovn system/io/ORCLovn-drv

Packages to install: 1
    `              Create boot environment: No
        Create backup boot environment: Yes
                     Services to change: 1

DOWNLOAD                          PKGS       FILES
XFER (MB) SPEED
    Completed
1.1/1.1   0 B/s                   1/1        19/19

PHASE                          ITEMS
Installing new actions         45/45
Updating package state database   Done
Updating image state              Done
Creating fast lookup database     Done
Reading search index              Done
Updating search index          1/1
```

Note - This step assumes you are upgrading the host drivers from a local repository. If you are upgrading the host drivers from a web repository, you can specify the URL for the location of the file. For example, http://drivers/system/io/ORCLovn-drv for a server named drivers.

7. (Optional) Unset the publisher by using the `pkg unset-publisher` command and specifying the directory location where the host driver file is located.

For example:

```
pkg unset-publisher /usr/ORCLovn
```

8. **Verify that all cabling is complete and correct.**
   If the physical layer connectivity is not functional, the nodes might not come online correctly after the server is rebooted.

9. **You can reboot the server by using any of the following commands:**

   - `reboot --rv`
   - `shutdown -y -g0 -ib`

10. **Allow the server to completely reboot, then log back in as root.**

11. **Verify that the upgraded version of host drivers is installed by issuing the `pkg list` command while grepping for `ORCLovn-drv` which is a part of the driver file name.**
    For example:

```
pkg list|grep ORCLovn-drv
          system/io/ORCLovn-drv (Oracle)
0.5.11-0.175.1.0.0.2.727    i--
```

12. **Confirm that the service is running:**

```
> svcs xsadmd
STATE         STIME     FMRI
online        11:10:35  svc:/application/xsadmd:default
```

13. **Display all the upgraded software and dependencies are installed by issuing the `modinfo` command and grepping for `xs` to find the installed software components.**
    For example:

```
modinfo | grep xs
170 7b246000  66f0    285     1 xstn (Xsigo Transport nexus driver v1)
171 7b24e000 1e060     -      1 xstl (Xsigo Transport services v0.2)
174 7b2a0000  f510    286     1 xsvnic (Xsvnic GLDv3 Driver)
181 7b2b0000 309b0    287     1 xsvhba (Xsigo Virtual HBA)
```

14. **Verify that the attachment points and XSTN nodes are up and running on the Oracle Solaris host:**

    - The host's HCA should be up and connected.
    - The host's IB fabric should be running.
    - The InfiniBand port link should be connected to the Oracle Fabric Interconnect. Oracle's Virtual Networking uses the InfiniBand port as a transport medium to the server.
    - Related IB services should be connected.

The bold text in the following example highlights the HCA and IB functionality that should be verified.

```
> cfgadm -a
Ap_Id                         Type          Receptacle    Occupant       Condition
c2                            scsi-sas      connected     configured     unknown
c2::dsk/c2t6d0                CD-ROM        connected     configured     unknown
c4                            scsi-sas      connected     configured     unknown
c4::w5000cca03c59d0c9,0       disk-path     connected     configured     unknown
c5                            scsi-sas      connected     unconfigured   unknown
c6                            scsi-sas      connected     configured     unknown
c6::w5000cca03c59acd9,0       disk-path     connected     configured     unknown
c7                            scsi-sas      connected     unconfigured   unknown
hca:21280001CF8382            IB-HCA        connected     configured     ok
ib                            IB-Fabric     connected     configured     ok
ib::21280001CF8383,0,ipib     IB-PORT       connected     configured     ok
ib::21280001CF8383,ffff,xstn  IB-VPPA       connected     configured     ok
ib::21280001CF8384,0,ipib     IB-PORT       connected     configured     ok
ib::21280001CF8384,ffff,xstn  IB-VPPA       connected     configured     ok
ib::daplt,0                   IB-PSEUDO     connected     configured     ok
ib::eibnx,0                   IB-PSEUDO     connected     configured     ok
ib::iser,0                    IB-PSEUDO     connected     configured     ok
ib::rdsib,0                   IB-PSEUDO     connected     configured     ok
ib::rdsv3,0                   IB-PSEUDO     connected     configured     ok
ib::rpcib,0                   IB-PSEUDO     connected     configured     ok
ib::sol_umad,0                IB-PSEUDO     connected     configured     ok
ib::sol_uverbs,0              IB-PSEUDO     connected     configured     ok
usb0/1                        unknown       empty         unconfigured   ok
usb0/2                        unknown       empty         unconfigured   ok
usb0/3                        unknown       empty         unconfigured   ok
usb1/1                        unknown       empty         unconfigured   ok
usb1/2                        unknown       empty         unconfigured   ok
usb2/1                        unknown       empty         unconfigured   ok
usb2/2                        usb-hub       connected     configured     ok
usb2/2.1                      unknown       empty         unconfigured   ok
usb2/2.2                      unknown       empty         unconfigured   ok
usb2/2.3                      usb-hub       connected     configured     ok
usb2/2.3.1                    unknown       empty         unconfigured   ok
usb2/2.3.2                    usb-storage   connected     configured     ok
usb2/2.3.3                    unknown       empty         unconfigured   ok
usb2/2.4                      usb-device    connected     configured     ok
usb2/3                        unknown       empty         unconfigured   ok
usb2/4                        usb-hub       connected     configured     ok
usb2/4.1                      unknown       empty         unconfigured   ok
usb2/4.2                      unknown       empty         unconfigured   ok
usb2/4.3                      unknown       empty         unconfigured   ok
usb2/4.4                      unknown       empty         unconfigured   ok
usb2/5                        unknown       empty         unconfigured   ok
```

▼ Upgrade Host Drivers for Oracle Solaris 11.3

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.

Before upgrading the host drivers, you must determine if the minimum requirements are fulfilled.

- The Oracle Solaris hosts must have at least one dual-port Oracle ConnectX2 QDR HCA.
- The HCA installed in the host must be running the firmware version 2.11.x or more.
- You must have root permissions on the Oracle Solaris host.

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

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

2. **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.

3. **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
    ```

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

5. **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
    ```

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

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

7. **Reboot the Oracle Solaris host.**

8. **Install the host drivers.**

    See "Install Host Drivers for Oracle Solaris 11.3" on page 19.

Uninstalling the Host Drivers

If Oracle Virtual Networking host drivers for Oracle Solaris are installed, and you need to completely uninstall them, you can do so by using the `pkg remove` command. When you remove the host drivers, all Oracle Virtual Networking functionality is no longer supported on the Oracle Solaris server.

Note - Starting with Oracle Solaris 11.3, the host drivers are integrated into the kernel. Therefore, the procedure for uninstalling the host drivers for Oracle Solaris 11.3 host varies from the other Oracle Solaris releases. For information, see "Install Host Drivers for Oracle Solaris 11.3" on page 19.

These topics describe the process of uninstalling the host drivers.

- "Uninstall Host Drivers for Oracle Solaris 11.1 or Oracle Solaris 11.2" on page 26
- "Uninstall Host Drivers for Oracle Solaris 11.3" on page 28

Related Information

- "Installing Host Drivers" on page 15
- "Upgrading the Host Drivers" on page 21

▼ Uninstall Host Drivers for Oracle Solaris 11.1 or Oracle Solaris 11.2

When you uninstall the host drivers, Oracle Virtual Networking functionality is no longer supported. The underlying Oracle Solaris OS is not affected. Also, note that unistalling the host drivers requires a reboot to purge the host drivers from memory.

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

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

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

    For example:

    ```
    pkg unset-publisher /usr/ORCLovn
    ```

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

   For example:

   `pkg uninstall ORCLovn-drv`

4. **Verify that all cabling is complete and correct.**

   If the physical layer connectivity is not functional, the nodes might not come online correctly after the server is rebooted.

5. **You can reboot the server to clear the host drivers from memory by using any of the following commands:**

   - `reboot --rv`
   - `shutdown -y -g0 -ib`

6. **Allow the server to completely reboot, then log in again ads a root user.**

7. **Check that no host drivers are installed by issuing the `pkg list` command while grepping for `ORCLovn-drv` which is part of the driver file name.**

   For example:

   `pkg list|grep ORCLovn-drv`

   This command should return nothing. The absence of command output indicates that no host drivers are installed.

8. **Check that none of the Oracle Virtual Networking services are running.**

   For example:

   ```
   svcs xsadmd
   STATE         STIME        FMRI
   ```

   This command should return nothing. The absence of command output indicates that no host drivers are installed.

9. **Check that no Oracle Virtual Networking software or dependencies are installed by issuing the `modinfo` command and grepping for `xs`.**

   For example:

   `modinfo | grep xs`

   This command should return nothing. The absence of command output indicates that no host drivers are installed.

▼ Uninstall Host Drivers for Oracle Solaris 11.3

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
```

2.   A new boot environment is created.

After reboot the server will be booted into the new BE.

3.   Ensure that the service is not present after reboot.

```
root@netra6:~# svcs -a | grep ovn-virtual
root@netra6:~#
```

For installing the Oracle Solaris 11.3 host drivers, see "Install Host Drivers for Oracle Solaris 11.3" on page 19.

Debug Tool: `xsigo-support`

For Oracle Solaris 11.1 and Oracle Solaris 11.2, Oracle Virtual Networking host drivers have a debug tool called `xsigo-support`. This script collects and dumps information for monitoring and troubleshooting your host-software installation. Oracle collects this information for debugging, or asks you to run the tool to gather the information and then send it to Oracle Technical Support. The `xsigo-support` script resides on the host server at this location:

```
/opt/orclovn/bin/xsigo-support
```

Note - `xsigo-support` tool does not support sending output to an output file (the `-o` *<filename>* argument).

As a result, if you are requested to send output of the `xsigo-support` script to Oracle Technical Support, you will need to put the output into a file before forwarding it to Oracle Technical Support.

Because the output of the `xsigo-support` script is usually large, it can scroll off the console screen. You can pipe the output to "more" to get more manageable amounts of output.

Use the `--help` suffix to display the keyword options:

./xsigo-support --help

By default, the `xsigo-support` script output is sent to a `bzip2` file, which is a tarred file with the `.bz2` extension.

For example:

```
/opt/orclovn/bin/xsigo-support
Creating Xsigo support package
./xsigo-support-sparc2-2013-03-13--09.55.09.tar.bz2
Done
```

Unzipping the `bz2` file shows the individual files that are collected while the `xsigo-support` script runs.

Note - Unzipping the file is not required, and you should not do it when sending the `xsigo-support` script output to Oracle Support. The contents of the `xsigo-support` script are provided here only for illustrative purposes.

```
bzip2 -d xsigo-support-sparc2-2013-03-xsigo-support-sparc2-2013-03-08--
10.59.49.tar.bz2
xsigo-support-sparc2-2013-03-13--09.55.09.tar.bz2
root@sparc2:~# tar xvf
xsigo-support-sparc2-2013-03-13--09.55.09.tar.bz2
x xsigo-support-sparc2-2013-03-13--09.55.09, 0 bytes, 0 tape blocks x xsigosupport-
sparc2-2013-03-13--09.55.09/etc, 0 bytes, 0 tape blocks x xsigo-supportsparc2-
2013-03-13--09.55.09/etc/path_to_inst.txt, 7099 bytes, 14 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/etc/release.txt, 220 bytes, 1 tape
blocks x xsigo-support-sparc2-2013-03-13--09.55.09/etc/name_to_major.txt, 2751
bytes, 6 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/etc/driver_aliases.txt, 14717
bytes, 29 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/etc/system.txt, 1946 bytes, 4 tape
blocks x xsigo-support-sparc2-2013-03-13--09.55.09/var, 0 bytes, 0 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/var/log, 0 bytes, 0 tape blocks x
xsigo-support-sparc2-2013-03-13--09.55.09/var/log/xsadmd.log, 101776 bytes, 199
tape blocks
```

x xsigo-support-sparc2-2013-03-13--09.55.09/var/crash, 0 bytes, 0 tape blocks x
xsigo-support-sparc2-2013-03-13--09.55.09/var/crash/mdb-stackregs-0.txt, 3673
bytes, 8 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/var/crash/mdb-msgbuf-0.txt, 17712
bytes, 35 tape blocks x xsigo-support-sparc2-2013-03-13--
09.55.09/var/crash/mdb-system-0.txt, 128 bytes, 1 tape blocks x xsigo-supportsparc2-
2013-03-13--09.55.09/var/crash/mdb-panicinfo-0.txt, 1033 bytes, 3 tape
blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/var/adm, 0 bytes, 0 tape blocks x
xsigo-support-sparc2-2013-03-13--09.55.09/var/adm/messages.0, 108822711 bytes,
212545 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/var/adm/messages.1, 1556288980
bytes, 3039627 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/var/adm/messages, 39325 bytes, 77
tape blocks x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds, 0 bytes, 0
tape blocks x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/svcs.txt,
7318 bytes, 15 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/threadlist-v.txt, 320083
bytes, 626 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/kstat-m-xsvhba.txt,
32 bytes, 1 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/mdb-k.txt, 84 bytes, 1
tape blocks x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/pkglist.
txt, 36418 bytes, 72 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/dladm-show-link.txt, 573
bytes, 2 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/ps-e.txt, 94 bytes, 1
tape blocks x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/isainfok.
txt, 35 bytes, 1 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/iostat.txt, 1293 bytes,
3 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/top.txt,
12532 bytes, 25 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/dladm-show-phys.txt, 830
bytes, 2 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/scanpci-v.txt,
17247 bytes, 34 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/prtconf-Dv.txt,
185977 bytes, 364 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/kstat-m-sd.txt,
8241 bytes, 17 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/ifconfig-a.txt,
1431 bytes, 3 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/vmstat.txt,
1293 bytes, 3 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/modinfo.txt,
15753 bytes, 31 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/cfgadm-a.txt,
3285 bytes, 7 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/svcs-xv.txt,
25 bytes, 1 tape blocks

```
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/pkginfo-l.txt,
149335 bytes, 292 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/kstat-m-xsvnic.txt,
32 bytes, 1 tape blocks
x xsigo-support-sparc2-2013-03-13--09.55.09/xsigo-cmds/ipadm.txt,
1326 bytes, 3 tape blocks
```

Sample contents of `xsigo-support`and related comments follow.

The output of **pkginfo -1** displays a listing of installed packages:

```
Output of 'pkginfo -l' -->
...
PKGINST: ORCLovnk
NAME: Xsigo Virtual IO drivers
CATEGORY: system
ARCH: i386
VERSION: 5.0.0-SL
BASEDIR: /
VENDOR: Oracle Corp.
DESC: Xsigo Virtual Adapter Drivers
PSTAMP: solbuild0120090918093550
INSTDATE: Sep 18 2009 10:05
HOTLINE: Please contact Oracle representative
EMAIL: support@oracle.com
STATUS: completely installed
FILES: 12 installed pathnames
        5 shared pathnames
        5 directories
            4 executables
            4080 blocks used (approx)
PKGINST: ORCLovnu
NAME: Oracle Virtual IO Applications
CATEGORY: application
ARCH: i386
VERSION: 5.0.0-SL
BASEDIR: /
VENDOR: Oracle Corp.
DESC: Xsigo Virtual Adapter Applications
PSTAMP: solbuild0120090918093551
INSTDATE: Sep 18 2009 10:05
HOTLINE: Please contact Oracle representative
EMAIL: support@oracle.com
STATUS: completely installed
FILES:    21 installed pathnames
           1 shared pathnames
           8 directories
           8 executables
           9668 blocks used (approx)
...
```

See the output of modinfo for IB and Oracle virtual resource information.

The following output is displayed for InfiniBand information modules:

```
...
86 ffffffffefcc8000 ba20  7  1  ib (IB nexus 1.28)
87 ffffffffefcd4000 a6b0  -  1  ibdm (InfiniBand Device Manager 1.26)
88 ffffffffefcdf000 11748 -  1  ibtl (IB Transport Layer v1.14)
89 ffffffffefcf0000 69b68 -  1  ibmf (IB Agent Interfaces 2.0)
90 ffffffffefd3a000 74468 8  1  hermon (ConnectX IB Driver)
...
```

The following output is displayed for Oracle virtual resource modules:

```
...
162 ffffffffff012b000   3a80 227   1 xstn (Xsigo Transport nexus driver v1)
163 ffffffffefc54920     848  22   1 sy (Indirect driver for tty 'sy' 1.)
165 ffffffffff08d2000 6c72f0  34   1 nvidia (nvidia Sep 19 2007 16:12:36)
167 ffffffffff0598000   f7f0   -   1 xstl (Xsigo Transport services v0.2)
...
    226 ffffffffff0813000 15858 229 1 xsvhba (Xsigo Virtual HBA)
...
    238 ffffffffefed2000  67d8 228 1 xsvnic (Xsvnic GLDv3 Driver)
...
```

The following additional InfiniBand port information is present:

```
Output of 'cfgadm -a | grep IB-VPPA' -->
ib::24E89097FEE21D,ffff,ipib    IB-VPPA    connected    configured  ok
ib::24E89097FEE21D,ffff,xstn    IB-VPPA    connected    configured  ok
ib::24E89097FEE21E,ffff,ipib    IB-VPPA    connected    configured  ok
ib::24E89097FEE21E,ffff,xstn    IB-VPPA    connected    configured  ok
```

Firmware version and additional device information is available for the HCA(s) in the host:

```
Output of 'cxflash -l' -->
List of available devices:
Device[0], /devices/pci@0,0/pci8086,3410@9/pci15b3,673c@0:devctl
    Class [IB]
        GUID: System Image - 0024e89097fee21f
              Node Image - 0024e89097fee21c
              Port 1 - 0024e89097fee21d
              Port 2 - 0024e89097fee21e
        Firmware revision : 2.7.0000
        No HW information available
```

This information shows a dual port HCA is installed, and the HCA is running the supported version of firmware.

The kernel log shows the buffer information being dumped by different drivers.

Note - The following example displays all the dmesg output, but you can refine the display by grepping for Xsigo components.

```
> dmesg
Thu Sep 24 15:29:51 PDT 2009
Sep 24 13:44:41 snarf xsvhba: [ID 824248 kern.notice] NOTICE: <vhba vh4>
xsvhba_delayed_connect: Retrying DATA Connect
Sep 24 13:44:41 snarf xsvhba: [ID 461420 kern.notice] NOTICE: <vhba vh4>
xsvhba_delayed_connect: Connect failed. rval: 13, handle : ffffffffa925e980
Sep 24 13:44:41 snarf xsvhba: [ID 744828 kern.notice] NOTICE: <vhba vh4>
xsvhba_chan_state_change: DATA:XSTL_CHAN_STATE_DISCONNECTED
Sep 24 13:44:41 snarf xsvhba: [ID 440485 kern.warning] WARNING: <vhba vh4>
xsvhba_send_xcm_msg: xstl_chan_write failed: rlen = -8
Sep 24 13:44:42 snarf xsvhba: [ID 824248 kern.notice] NOTICE: <vhba vh6>
xsvhba_delayed_connect: Retrying DATA Connect
Sep 24 13:44:42 snarf xsvhba: [ID 461420 kern.notice] NOTICE: <vhba vh6>
xsvhba_delayed_connect: Connect failed. rval: 13, handle : ffffffffa92589c0
Sep 24 13:44:42 snarf xsvhba: [ID 744828 kern.notice] NOTICE: <vhba vh6>
xsvhba_chan_state_change: DATA:XSTL_CHAN_STATE_DISCONNECTED
...
```

Displaying kernel log information for a specific Oracle component (in this case XSTN):

```
> dmesg | grep xstn
Oct 26 09:15:12 snarf xstn: [ID 835877 kern.notice] NOTICE: xstn1: xcm channel
state change to 2 on rec 1
Oct 26 10:34:24 snarf xstn: [ID 835877 kern.notice] NOTICE: xstn0: xcm channel
state change to 16 on rec 0
Oct 26 10:37:37 snarf xstn: [ID 835877 kern.notice] NOTICE: xstn0: xcm channel
state change to 2 on rec 0
>
```

All the current Oracle processes are displayed:

```
Output of 'svcs xsadmd' -->
STATE          STIME FMRI
online         17:21:30 svc:/application/xsadmd:default
Network device information:
Output of 'ifconfig -a' -->
lo0: flags=2001000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4,VIRTUAL> mtu 8232
index 1
        inet 127.0.0.1 netmask ff000000
bnx0: flags=201004843<UP,BROADCAST,RUNNING,MULTICAST,DHCP,IPv4,CoS> mtu 1500
index 2
        inet 192.168.10.191 netmask fffff800 broadcast 192.168.15.255
        ether 0:23:ae:fd:80:d4
xsvnic2: flags=201000842<BROADCAST,RUNNING,MULTICAST,IPv4,CoS> mtu 1500 index 3
        inet 0.0.0.0 netmask 0
        ether 0:13:97:2:50:8f
...
```

The bnx0 device is the physical NIC in the host. The xsvnix2 is the Oracle virtual NIC.

Currently loaded Oracle host drivers:

- For general information, use the output of **pkginfo** while grepping for XSIGO.

  This is case sensitive.

  ```
  > pkgrepoinfo | grep XSIGO
  system       ORCLovnk            Xsigo Virtual IO drivers
  application  ORCLovnu            Xsigo Virtual IO Applications
  ```

- For more detailed information, use the output of **pkginfo** for the currently installed driver. For example, to show a detailed listing of a named package that was completely installed.

  ```
  > pkginfo -il ORCLovnu
   PKGINST: ORCLovnu
      NAME: Oracle Virtual Networking Applications
  CATEGORY: application
      ARCH: i386
   VERSION: 5.0.0-SL
   BASEDIR: /
    VENDOR: Oracle
      DESC: Oracle Virtual Network Adapter Applications
    PSTAMP: solbuild0120090918093551
  INSTDATE: Sep 18 2012 10:05
   HOTLINE: Please contact Oracle representative
     EMAIL: support@oracle.com
    STATUS: completely installed
     FILES: 21 installed pathnames
            1 shared pathnames
            8 directories
            8 executables
         9668 blocks used (approx)
  ```

Oracle service modules are loaded and running:

```
Output of svcs xsadmd-->
STATE     STIME     FMRI
online    17:21:30  svc:/application/xsadmd:default
```

You can also check console messages in /var/adm/messages:

```
> vi /var/adm/messages
"/var/adm/messages" 13847 lines, 1833733 characters
Oct 20 03:10:01 snarf syslogd: line 24: WARNING: loghost could not be resolv
ed
Oct 20 12:46:17 snarf e1000g: [ID 801725 kern.info] NOTICE: pciex8086,108c -
e1000g[0] : link down
Oct 20 12:46:36 snarf e1000g: [ID 801725 kern.info] NOTICE: pciex8086,108c -
e1000g[0] : link up, 100 Mbps, full duplex
Oct 20 12:46:36 snarf /sbin/dhcpagent[44]: [ID 967406 daemon.warning] refres
hing state on e1000g0
```

```
Oct 20 12:46:37 snarf /sbin/dhcpagent[44]: [ID 778557 daemon.warning] config
ure_v4_lease: no IP broadcast specified for e1000g0, making best guess
Oct 21 12:59:34 snarf xstn: [ID 835877 kern.notice] NOTICE: xstn0: xcm chann
el state change to 16 on rec 0
...
```

Related Information

- "Install Host Drivers for Oracle Solaris 11.1 or Oracle Solaris 11.2" on page 16

Glossary

HCA Host channel adapter.

Host Host is the part of the server module that works with the CPU and other hardware to run the OS and other applications.

IB-VPPA IB virtual physical point of attachment.

IPS Image packaging system.

LUN Logical unit number.

Option ROM Option ROM contains a small footprint of the Oracle Virtual Networking drivers that is needed to bring up the vNIC's and vHBA's at remote boot time.

Oracle Fabric Interconnect The Oracle Virtual Networking directors that connect the InfiniBand to the hosts and virtualize their I/O.

VHBA Virtual host bus adapter.

VNIC Virtual network interface controller.

XgOS XgOS is the operating system that works on the Oracle Fabric Interconnect.

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