

Oracle® Communications Diameter Signaling Router vSTP Time Division Multiplexing (TDM) Installation Guide



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1

Introduction

This chapter describes how to obtain help, where to find related documentation, and provides other general information.

Overview

The Time Division Multiplexing (TDM) over vSTP enables signal transmission over the ADAX HDC3 PCIe card and provide direct access using PCIe pass through.

Acronyms

Table 1-1 Acronyms

Term	Definition
HSL	High Speed Link
LSL	Low Speed Link
MEAL	Measurement Event Alarm Logging
MO	Managed Object
MSU	Message Signal Unit
MTP	Message Transfer Part
PC	Point Code
SCCP	Signaling Connection Control Part
TDM	Time Division Multiplexing
vSTP	Virtual Signaling Transfer Point

Terminology




Table 1-2 Terminology

Term	Definition
E1	E1 is a digital transmission link with a total baud rate of 2.048 Mbps (2048000 bits per second).
T1	T1 is a digital transmission link with a total baud rate of 1.544 Mbps (1544000 bits per second).

Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage.

Table 1-3 Admonishments

Icon	Description
 DANGER	Danger: (This icon and text indicate the possibility of personal injury.)
 WARNING	Warning: (This icon and text indicate the possibility of equipment damage.)
 CAUTION	Caution: (This icon and text indicate the possibility of service interruption.)

Locate Product Documentation on the Oracle Help Center Site

Oracle Communications customer documentation is available on the web at the Oracle Help Center site, <http://docs.oracle.com>. You do not have to register to access these documents. Viewing these files requires Adobe Acrobat Reader, which can be downloaded at <http://www.adobe.com>.

1. Access the Oracle Help Center site at <http://docs.oracle.com>.
2. Click **Industries**.
3. Under the Oracle Communications subheading, click **Oracle Communications documentation** link.

The Communications Documentation page displays. Most products covered by these documentation sets display under the headings Network Session Delivery and Control Infrastructure and Platforms.

4. Click on your product and then the release number.
A list of the documentation set for the selected product and release displays.
5. To download a file to your location, right-click the **PDF** link, select **Save target as** (or similar command based on your browser), and save to a local folder.

Customer Training

Oracle University offers training for service providers and enterprises. Visit our web site to view, and register for, Oracle Communications training at <http://education.oracle.com/communication>.

To obtain contact phone numbers for countries or regions, visit the Oracle University Education web site at www.oracle.com/education/contacts.

My Oracle Support

My Oracle Support (<https://support.oracle.com>) is your initial point of contact for all product support and training needs. A representative at Customer Access Support can assist you with My Oracle Support registration.

Call the Customer Access Support main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. When calling, make the selections in the sequence shown below on the Support telephone menu:

1. Select **2** for New Service Request.
2. Select **3** for Hardware, Networking and Solaris Operating System Support.
3. Select one of the following options:
 - For Technical issues such as creating a new Service Request (SR), select **1**.
 - For Non-technical issues such as registration or assistance with My Oracle Support, select **2**.

You are connected to a live agent who can assist you with My Oracle Support registration and opening a support ticket.

My Oracle Support is available 24 hours a day, 7 days a week, 365 days a year.

Emergency Response

In the event of a critical service situation, emergency response is offered by the Customer Access Support (CAS) main number at 1-800-223-1711 (toll-free in the US), or by calling the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with Oracle.

2

Installing vSTP with TDM Support

This section provides instructions for installing vSTP software and ADAX drivers to enable TDM support over vSTP:

Prerequisites

Following are the pre-requisites you must have before proceeding with the installation of vSTP software with TDM support:

1. The Adax cards must be installed or attached in the host machine.
2. The firmware and bios must be up to date. - Refer appendix A for updating firmware on Host using the OSA(Oracle system assistant)
3. The Adax driver rpms compatible with Oracle Linux 6.10 must be available.
4. The vSTP-MP VM profile must be configured.



Note:

The vSTP MP requires 8GB of RAM.

Configuring PCI Pass Through over Cloud

Perform the following steps to configure PCI pass through over cloud:

1. Configure nova-scheduler (controller).
Add **PciPassthroughFilter** filter to nova.conf with the following command:

```
[filter_scheduler]
enabled_filters = <your filters>, PciPassthroughFilter
available_filters = nova.scheduler.filters.all_filters
```

2. Locate vendor_id and product_id of the Adax card (compute).
Execute the following **lspci** command to show vendor_id and product_id:

```
lspci -v |grep -i Adax -B 2 -A 8
```

Sample Output:

```
14:00.0 Power PC: Freescale Semiconductor Inc Device 0091 (rev 21)
Subsystem: Adax, Inc. Device 0883
Flags: bus master, 66MHz, fast devsel, latency 64, IRQ 26, NUMA node 0
Memory at c7000000 (32-bit, non-prefetchable) [size=2M]
Memory at c0000000 (32-bit, prefetchable) [size=32M]
Memory at c7200000 (64-bit, non-prefetchable) [size=4K]
Memory at c6000000 (64-bit, non-prefetchable) [size=16M]
Capabilities: [48] CompactPCI hot-swap <?>
Kernel driver in use: vfio-pci
```

In the above output, 14:00.0 is the PCI address of the Adax card, Using this address, the vendor_id and product_id can be listed with the following command:

```
lspci -nn -s 14:00.0
```

Sample Output:

```
14:00.0 Power PC [0b20]: Freescale Semiconductor Inc Device [1957:0091] (rev 21)
```

In the above output, 14:00.0 is the PCI address of the Adax card, Using this address, the vendor_id and product_id can be listed as follows:

- vendor_id=1957
- product_id=0091

3. Configure nova-api (controller).

Add Adax card to nova.conf file on the controller:

The type of the card must be **type-PCI**. Name can be anything.

Example:

```
[pci]
pci_passthrough_whitelist = [{"vendor_id": "1957", "product_id": "0091"}]
alias = [{"vendor_id": "1957", "product_id": "0091", "device_type": "type-PCI", "name": "adax1"}]
```

In this example the card name is Adax1:

Note: If multiple Adax cards are connected to a host, multiple alias needs to be created. In this example, one Adax card is connected to a host.

4. Update flavor with the card name (controller or cli box).

Execute the following command:

```
openstack flavor set Adax --property
"pci_passthrough:alias"="Adax1:1"
```

Note: To connect multiple Adax cards to a VM, use Adax1:2 (connect 2 cards), Adax1:3 (connect 3 cards).

5. Configure nova-compute (compute)

Whitelist Adax1 card on the compute node in nova.conf with the following command:

```
[pci]
pci_passthrough_whitelist = [{"vendor_id": "1957", "product_id": "0091"}]
```

6. Restart the controller and compute services.

- Restart the controller services with the following command:

```
systemctl restart openstack-nova-api.service
openstack-nova-conductor.service
openstack-nova-consoleauth.service
openstack-nova-metadata-api.service
openstack-nova-scheduler.service
```

- b. Restart the compute services with the following command:

```
systemctl restart openstack-nova-compute.service
```

Installing DSR

Install the DSR software. For information related to DSR software installation, refer to DSR Software Installation Guide for DSR Release 8.4.

Installing Adax rpms on vSTP-MP

Perform the following steps on vSTP-MP. These steps are applicable to VMs to be enabled for TDM support:

Note:

The IP/Sigtran only vSTP-MP must not execute these steps.

1. Login to vSTP-MP

Switch the user to **root** and enter command:

```
sudo su
```

2. Set off the vSTP process.

3. Install Adax rpms

Execute the following commands to install Adax rpms:

```
rpm -ivh Adax-LiS-2.21.8-1-RedHat-6.10-x86-64bit.rpm
rpm -ivh Adax-hdc-1.79-1-RedHat-6.10-x86-64bit-LiS2.21.8-MAJ234.rpm
rpm -ivh Adax-qcx-1.25-1-Linux-x86-64bit.rpm
```

Note: The Adax driver rpms compatible for Oracle Linux 6.10 must be available at path: /root/ folder.

4. Verify the Adax driver installation on the vSTP-MP.

Verify the Adax driver installation on vSTP-MP from S05hdc.log file. The log file must not report any error.

Execute the following command:

```
vim /tmp/S05hdc.log
```

Note: The **Failed to open /usr/net/Adax/hdc/hdc_instances.conf, errno 2** error occurs during verification. This error can be ignored.

5. Turn off cloud-init services.

Execute the following command to turn off the services:

```
sudo chkconfig cloud-init off
sudo chkconfig cloud-init-local off
```

- Verify that all cloud-init services are off for each level. Execute the following command to verify:

```
sudo chkconfig cloud-init --list
```

Example Output:

```
cloud-init 0:off 1:off 2:off 3:off 4:off 5:off 6:off
chkconfig cloud-init-local --list
cloud-init-local 0:off 1:off 2:off 3:off 4:off 5:off 6:off
```

Adax HDC3 Configuration using QCX

The Adax HDC3 PCIe card supports E1 mode and T1 Mode. .

The static QCX configuration file is used for configuring E1 or T1 mode on trunc of Adax HDC3 PCIe card. This allows T1 or E1 operations to be selected on a particular trunc for the PCIe card.

Note:

Adax HDC3 PCIe card does not allow a mix of T1 or E1 to be configured. Also, there can only be one entry per trunc or port in QCX configuration file.

The following table describes the modes allowed to be configure on HDC3 PCIe card:

Parameter	Trunk Type - E1	Trunk Type - T1
Framing	NA	D4,ESF(default)
Encoding	HDB3	AMI, B8ZS(default)
Trunk (Port)	0-7	0-7
Clock Source	ACS (default), MCS, ICS	ACS (default) , MCS ,ICS
CRC	CRC4, NOCRC4	NA

The recommended values for T1 Trunc configuration are: *Framing - ESF, Encoding - B8ZS, Clock: ACS* or *Framing - D4, Encoding - AMI, Clock: ACS*

Configuring E1/T1 parameters on vSTP MP

The Adax driver provides configuration file to update or enable the E1 or T1 connection parameters. QCX configuration file is located in `/usr/net/Adax/qcx/` folder and the filename is `qcx_conf.0`.

Perform the following steps to do the configuration:

- Login to vSTP -MP.
- Change user as root with the following command:

```
sudo su
```

- Open the `qcx_conf.0` file.

```
vim/usr/net/Adax/qcx/qcx_conf.0
```



Note:

If `qcx_conf.0` file is not available, use following command to create `qcx_conf.0` file from existing default configuration file.

```
cp /usr/net/Adax/qcx/qcx_conf.0.hdc /usr/net/Adax/qcx/qcx_conf.0
```

4. Update the E1 or T1 trunc type selection, Framing, Encoding scheme and Adax board clocking source selection as per deployment requirement.

- a. Set Trunc type E1 or T1:

```
TRUNK_TYPE T1
```

- b. Trunk configuration:

```
trunk <n> [parameters]  
trunk 0 ICLK
```

5. Apply updated parameters using following command:

```
/usr/net/Adax/qcx/qcx_conf -r -f /usr/net/Adax/qcx/qcx_conf.0
```

6. Verify trunc /port status:

```
cd /usr/net/Adax/qcx  
./qcctest -d hdcx
```

Sample Output:

```
qcctest> status 0
```

3

Uninstalling vSTP with TDM Support

Uninstalling vSTP Software Patch

To uninstall the vSTP software patch, follow the uninstall steps from the downloaded patch.

Uninstalling Adax Drivers

Perform the following steps to uninstall the Adax drivers:

1. Login to vSTP-MP.
2. Stop vSTP process with the following command:

```
pm.set off vstp
```
3. Change user to **root**.

```
sudo su-
```
4. Remove the qc_x_conf.0 file.

```
rm -f /usr/net/Adax/qcx/qcx_conf.0
```
5. Stop and remove the Adax QCX module.

```
chkconfig qcx stop
```



```
chkconfig --del qcx
```
6. Stop and remove the Adax HDC module.

```
chkconfig hdc stop
```



```
chkconfig --del hdc
```
7. Stop and remove the Adax LiS module.

```
chkconfig Adax-str stop
```



```
chkconfig --del Adax-str
```
8. Remove Adax driver rpms.

```
rpm -e Adax-qcx-1.25-1.x86_64 Adax-hdc-1.79-1.x86_64 Adax-LiS-2.21.8-1.x86_64
```
9. Reboot vSTP-MP.

```
init 6
```

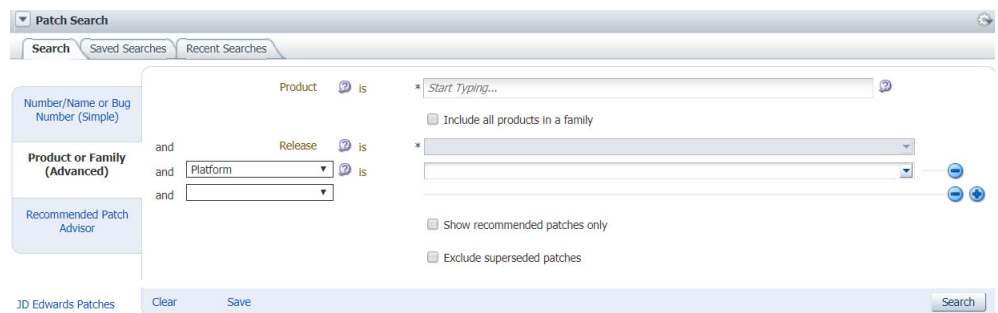
A

Appendix A Upgrade Host Firmware using Oracle System Assistant

Execute the following steps to upgrade all the firmware using Oracle System Assistant (OSA):

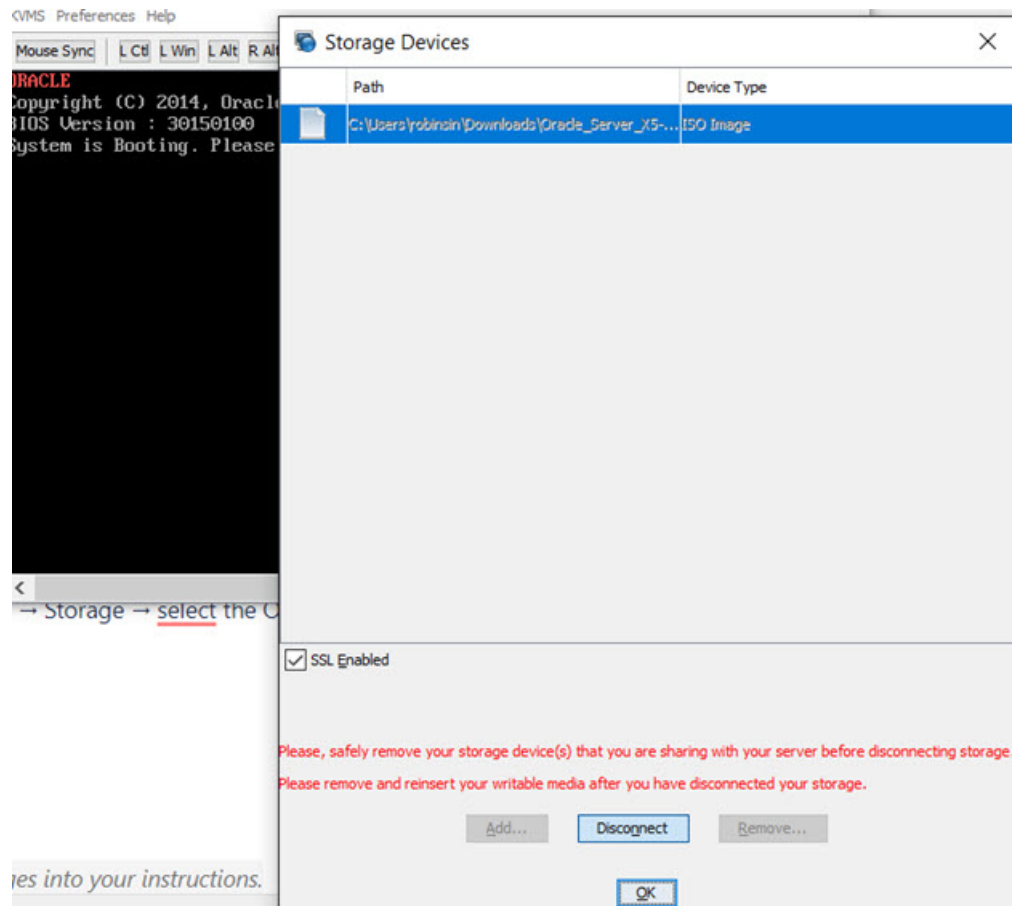
1. Obtain the .iso file for OSA using the following steps:
 - a. Login to URL: <https://support.oracle.com>
 - b. In the **How Do I...?** header click **Download a Patch**. A new tab for **Patches and Updates** gets opened.
 - c. Select **Product or Family (Advanced)** tab under the **Patch Search** header.

Figure A-1 Searching Patch



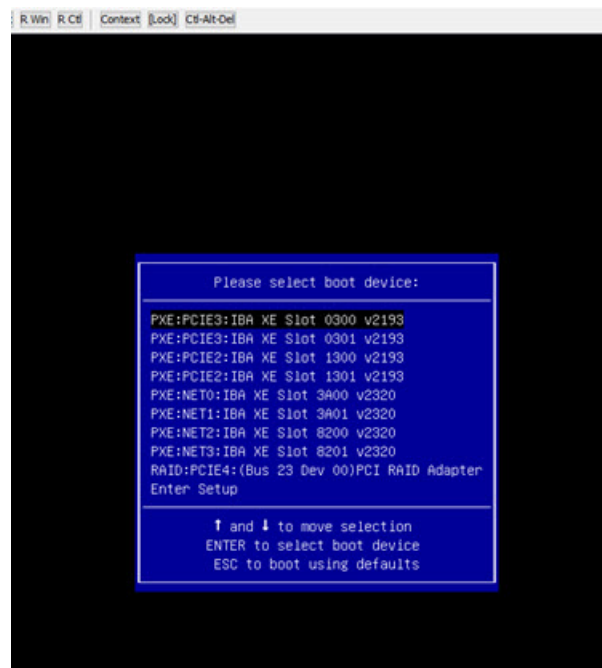
- d. Enter the name of the server for which the OSA is required and select the required version. For example, Oracle server X7-2.
 - e. Click on **Search** button. The list of available patches appears on the screen.
 - f. Select and download the required Oracle System Assistant image from the list. Save on local machine.
2. Perform the following steps to mount and boot the ILOM using the downloaded OSA image file:
 - a. Log in to the ILOM for which the firmware needs to be updated.
 - b. Launch the Remote Console.
 - c. In the remote console window menu, select **KVMS > Storage**. The **Storage Devices** window gets opened. Select the OSA image from local machine, which is downloaded in the previous step. This creates a virtual Flash drive with the image on it.
 - d. Select the uploaded image and click **Connect**.

Figure A-2 Upload Image



- e. In the Boot menu, select press F8 from the keyboard and to select Boot popup menu.
- f. There will a virtual Flash drive. Select the drive by pressing **Enter**. The ILOM will boot with OSA image.

Figure A-3 ILOM Boot process



3. The boot process will continue for about 45 minutes. After this, the option for OSA starts appearing in the ILOM.
4. Click **Update Firmware > Install updates**. The server will switch ON/OFF several times during the process.
5. After the process is complete, reboot the server. The firmware will be upgraded to the latest version after the reboot.