

Cisco Remote PHY Device Operations and Debugging

This document describes the RPD operations and debugging of an RPD.

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Hardware Compatibility Matrix for Cisco Remote PHY Device

Note Unless otherwise specified, the hardware components introduced in a given Cisco Remote PHY Device Software Release are supported in all subsequent releases.

Table 1: Hardware Compatibility Matrix for the Cisco Remote PHY Device

Cisco HFC Platform	Remote PHY Device
Cisco GS7000 Super High Output Node	**Cisco 1x2 / Compact Shelf RPD Software 2.1 and Later Releases** Cisco Remote PHY Device 1x2 • PID—RPD-1X2= **Cisco 1x2 / Compact Shelf RPD Software 2.1a and Later Releases** Cisco Remote PHY Device 1x2 • PID—RPD-1X2-PKEY=

Cisco HFC Platform	Remote PHY Device
Cisco GS7000 Super High Output Intelligent Node (iNode)	**and Later Releases** Cisco Intelligent Remote PHY Device 1x2 • PID—iRPD-1X2= • PID—iRPD-1X2-PKEY=

Note The -PKEY suffix in the PID indicates units that enable the SCTE-55-2 Out-of-Band protocol support.

Information about RPD Operations and Debugging

The operators might need secure remote access to the RPD for activities such as setting up the RPD before the installation, maintenance, or troubleshooting. The RPD supports Secure Shell (SSH) server that allows secure access to the RPD.

Prerequisites for RPD Operations

The following prerequisites are applicable for debugging or checking RPD operations:

- RPD has established GCP connection with the CCAP-core, and RPD IP address is retrievable from CCAP-core.
- RPD is assigned an IP address through the DHCP process, and the IP address is retrievable from the DHCP server.

How to Access and Debug RPD

Note To know more about the commands referenced in this module, see the Cisco IOS Master Command List.

Accessing RPD using SSH

After logging in to the RPD for the first time, the system shows a security warning.

```
SECURITY WARNING: ssh password login is accessible!
Please use pubkey login and set password login off!
```

The following procedure shows how to use SSH to access RPD without password from NMS.

1. Check whether NMS already has an SSH key. If yes, do not generate a new key.
2. Generate a new SSH key in NMS.

```
cat ~/.ssh/id_rsa.pub
ssh-keygen -t rsa
```

3. Add the NMS public key in RPD.

```
ssh pubkey add ?
LINE          NMS's pubkey
```

4. Verify whether NMS can connect using SSH to RPD without a password.

```
ssh -l admin <RPD ip>
```

Disabling SSH Login Password

Use the following commands to apply the Event Profile to an RPD:

```
R-PHY#conf t
R-PHY(config)#ssh password ?
off                  disable ssh password login
on                   enable ssh password login
R-PHY(config)#ssh password off
R-PHY(config)#end
```

Debugging RPD

Use the following procedure to debug RPD:

1. Disable RPD auto reboot by setting the reboot hold.

```
R-PHY# set reboot hold
```

2. Secure copy the logs of RPD to the server using the following command.

```
logging provision-archive scp server_ip user_id dst_location
```

3. Collect the show CLI output.

   For RPD online issues, check which status is failed. You can check the following outputs:

   - show provision all
   - show provision history
   - show dot1x detail
   - show dhcp
   - show tod
   - show ptp clock 0 config
   - show ptp clock 0 state

   For modem online issue, check ds/us config and l2tp session.

   You can collect the following outputs:

   - show downstream channel configuration
   - show downstream channel counter dps (show multiple times)

- show downstream depi configuration
- show upstream channel configuration <port number> <channel number>
- show upstream iuc counter <port number> <channel number> (show multiple times)
- show upstream map counter <port number> <channel number> (show multiple times)
- show upstream uepi configuration
- show l2tp tunnel
- show l2tp session

4. Enable RPD auto reboot, after collecting all logs and CLI output.

```
R-PHY#clear reboot hold
```

Verifying Disabled SSH Password Login

To check whether the SSH logging in using a password is disabled, use the show ssh session command as given in the following example.

```
R-PHY#show ssh session
connected session: 1
ssh password auth: off
ssh NMS pubkey num: 1
R-PHY#
```

Configuration Examples

This section provides example for the fault management configuration on R-PHY.

Example: Generating a New NMS pubkey

```
$ cat ~/.ssh/id_rsa.pub

$ ssh-keygen -t rsa

$ cat ~/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAABIwAAAgEAtQCXVFmRIwemejbTx0+U8taMq5n4Zetu
71xb+dtHV8Rr0wejiK1YJkT93n9hcBxsjHRu76bLp99l+DDNL3+THljwnMQC1CsdvRmGXoe
Gf1mT9aTlGDf/ RW9ZywY9t8Kep9VnANu2DWSoh0wg2pE49HFOJAbGfuFOvPEdwZGGDMQNWs
Eq/3xAQjBxajQqfgu4IqjVzKoo4PM/xx9X4Z1aMwxS3DvyN7L8O0o33mcDNsasl3SslIjMSNfq
YpwOFvQve8c2onrYHUx2p3BwQOb/b0FzFQhZMTBXm/pDMXq/fkkD0uguk1xOGnqAATMJsSHIN
0UOdvbzhhmrFRBBM4NzqQG5kNt7KvnWgxE7HdalERvMyBC2MCGbFSHmQFyWmHBHPPmLIxK98W
XutoR8fzzs+4hingZ4X9DMMNwTQ6WOzjuKq6iU= userid@example.cisco.com
```

Example: Adding NMS pubkey in RPD

```
R-PHY#conf t
R-PHY(config)#ssh pubkey add ?
LINE                NMS's pubkey
```

```
R-PHY(config)#ssh pubkey add ssh-rsa AAAAB3NzaC1yc26876bhjdsk
EEEAAAABIwAAAgErP3nFp0v0k3Nf4UvSTuOOQi2h0mAfAtQCXVFmRIwemejbTx0+U8taM
q5n4Zetu71xb+dtHV8Rr0wejiK1YJkT93n9hcBxsjHRu76bLp99l+DDNL3+THljwnMQC1
CsdvRmGXoeGf1mT9aTlGDf/YfKxZMozMnR9qlGJFXlRAwGMsCRlllnV6IkFyh59P9Udkd
SSWv+QL8lCftWBmMnyt/CkqL98NK0Vp0gIYRv7UKCwhK40c8X7PhzxCmKVFTUv3bf9VIP
NA2esgzKDFpoJZkqCjrnXU1Xu0Oj8Twci7f0ytSrFxVKuWp4XZbVDpWGH90BOQR8gKHmq
urP3nFp0v0k3Nf4UvSTuOOQi2h0mAf+9wzm+ab41ToadUbMawHyFYyuU= xxx@xxx.xxx.com
R-PHY(config)#end

R-PHY#show ssh nms-pubkey ssh-rsa AAAAB3NzaC1yc2EAAAABIwAAAgEAtQCXVFm
RIwemejbTx0+U8taMq5n4Zetu71xb+dtHV8Rr0wejiK1YJkT93n9hcBxsjHRu76bLp99l
+DDNL3+THljwnMQC1CsdvRmGXoeGf1mT9aTlGDf/YfKxZMozMnR9qlGJFXlRAwGMsCRll
lnV6IkFyh59P9UdkdSSWv+QL8lCftWBmMnyt/CkqL98NK0Vp0gIYRv7UKCwhK40c8X7Ph
zxCmKVFTUv3bf9VIPNA2esgzKDFpRvMyBC2MCGbFSHmQFyWmHBHPPmLIxK98WXutoR8fzz
s+4hingZ4X9DMMNwTQ6WOzjuKq6iU= xxx@xxx.xxx.com
```

Feature Information for RPD Operations and Debugging

Use Cisco Feature Navigator to find information about the platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to the www.cisco.com/go/cfn link. An account on the Cisco.com page is not required.

Note The following table lists the software release in which a given feature is introduced. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 2: Feature Information for RPD Operations and Debugging

Feature Name	Releases	Feature Information
RPD Operations and Debugging	Cisco 1x2 RPD Software 1.1	This feature was introduced on the Cisco Remote PHY Device.