Information about Cisco Smart PHY

The Cisco Smart PHY application is an integrated package for installing, configuring, monitoring and troubleshooting the Cisco Remote-PHY devices (RPD) connected to the Cisco CMTS. It is a micro-services platform for customers and partners to collaborate and build an application ecosystem around on-box innovation. It enables multiple use cases, including:

- Traffic engineering
- Network change automation
- Real-time key performance indicator (KPI) monitoring
- Predictive maintenance and impact analysis
- Security

These are some general instructions and information for using the Cisco Smart PHY:

Icon	Description
	Information button. Click this button to display more information.
	Context Menu button. Move the mouse over this button to display a context menu.

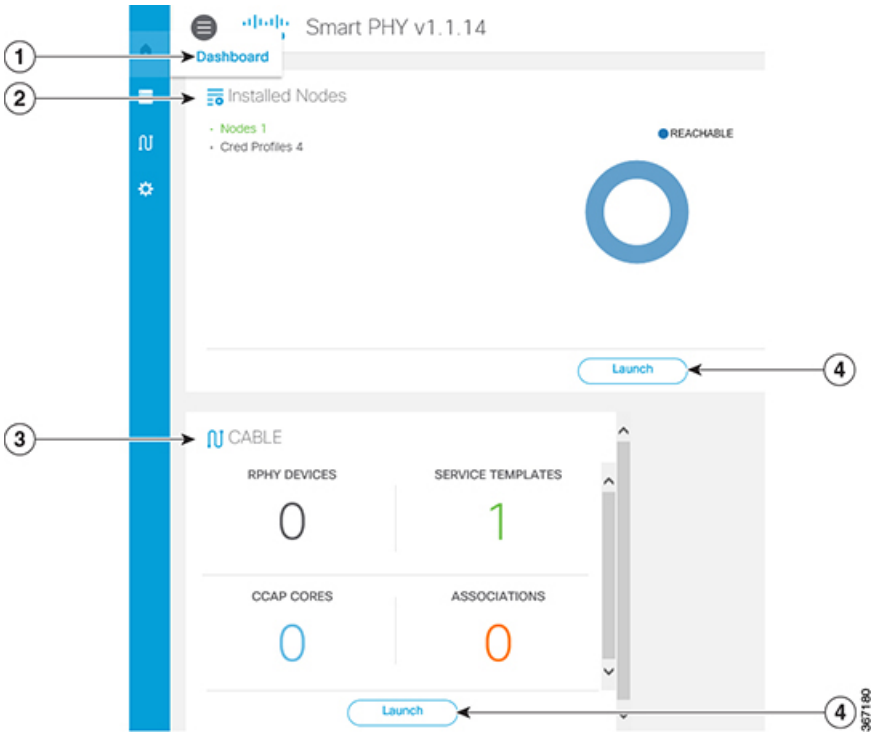
Benefits of Cisco Smart PHY

Typically, 200 to 500 RPDs might be connected to a single Cisco CMTS and manual configuration and monitoring could pose a problem.

Following are some of the benefits of using the Cisco Smart PHY application:

- Initial RPD Zero-Touch Automation: Initial RPD installation and provisioning with Zero-touch of the Cisco CMTS.
- RPD Inventory: RPD inventory operations. For example, running inventory reports or searching for RPDs based on specific criteria and so on.
- RPD SW Management: RPD SW version management.

Dashboard



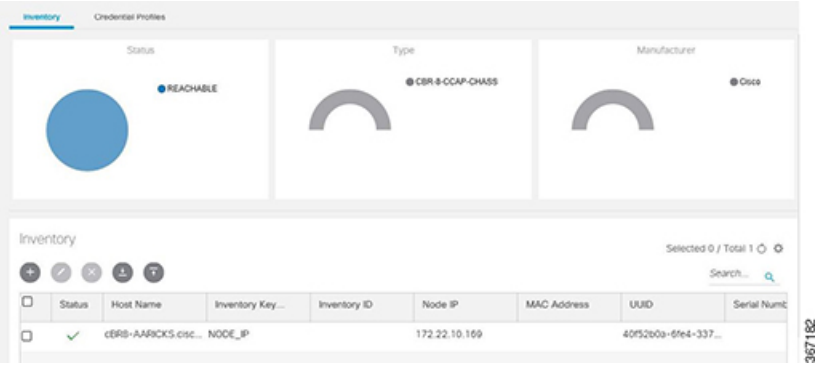
Following are the field descriptions:

Callout #	Name	Description
1	Dashboard	Snapshot view of all devices managed and monitored by the Cisco Smart PHY application.

Callout #	Name	Description
2	Installed Nodes	Shows the number of nodes installed using the Cisco Smart PHY application. This panel also shows the number of Credential Profiles available in the application. The pie chart shows the reachable and unknown nodes.
3	Cable	Shows the number of RPDs, Service Templates, CCAP Cores, and Associations configured and managed using the Cable RPD Automation page. Click on a number to view more details. Click on Launch to go to the Cable RPD Automation page.
4	Launch	Takes you to the specific page view.

Inventory

Inventory has two tabs; Inventory and Credential Profiles.



Inventory

The Inventory tab enables you to add, organize, and update information about the network devices. This includes non-Cable devices too and hence the information to be provided is more exhaustive than in the Cable RPD Automation view.

Note You must add the RPDs through the Cable Pairing table in Cisco cBR and not through the Inventory tab in the Cisco Smart PHY application.

Following are the field descriptions for Inventory:

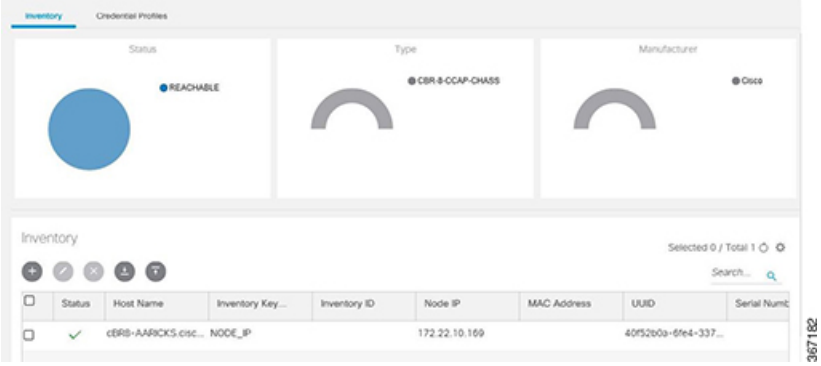
Name	Description
Status	Shows a graphical pie chart of all devices in the network, categorized by status: • Reachable • Unreachable
Type	Shows a graphical chart of all devices in the network, categorized by type (SNMP, Telnet/SSH, HTTP, and TL1).
Manufacturer	Shows a graphical chart of all devices in the network, categorized by vendor (Cisco and third party). The charts let you see, at a glance, the distribution of devices in the network.
	Adds a device to existing inventory.
	Edits device information.
	Deletes a device from the inventory.
	Exports device information to a CSV file.
	Imports devices by using a CSV file.
Search	Allows you to search for and filter the network devices.
Devices table	Shows detailed information about each device in the network.

Credential Profiles

Credential profiles are collections of device credentials for SNMP, Telnet/SSH, HTTP, and TL1 network devices. Using credential profiles lets you apply credential settings consistently across devices. When you add or import devices, you specify the credential profile the devices use. If you need to make a credential

change, such as changing a device password, you can edit the profile to update the settings across all devices that use that profile.

Figure 1: Credential Profiles



Following are the field descriptions for Credential Profiles:

Name	Description
+ Create New	Allows you to add or edit a credential profile. Note: Mandatory fields are marked with an asterisks.
rpd_default	This credential profile is the default RPD profile generated by the system. When a user deletes this profile and new one is generated automatically by the system immediately. Any new RPD added to the inventory is associated with the rpd_default profile.
Save/Delete/Cancel	Use these buttons to complete your action.

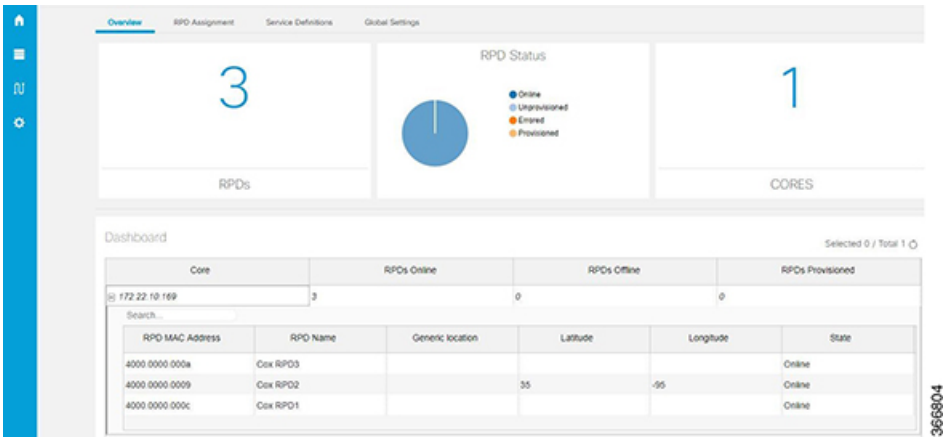
Cable RPD Automation

The Cable RPD Automation page enables you to add, organize, and update information about CMTS and RPD devices in the network. The information to be provided in this view is less compared to that in the Inventory Manager view because this view is specific to Cable devices.

The Cable RPD Automation page has three tabs; Overview, RPD Assignment, and Service Definitions.

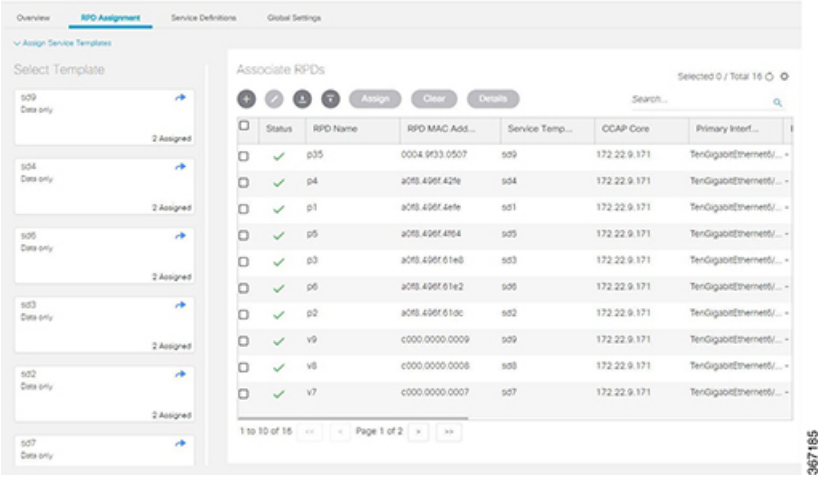
Overview

Provides a view of the number of RPDs, their status, and the number of Cores. Also, it provides a dashboard view of the Core and the RPDs in different status.



RPD Assignment

Allows you to add, edit, import, or export RPDs associated with a specific service template. Search allows you to search for or filter the associated RPDs.



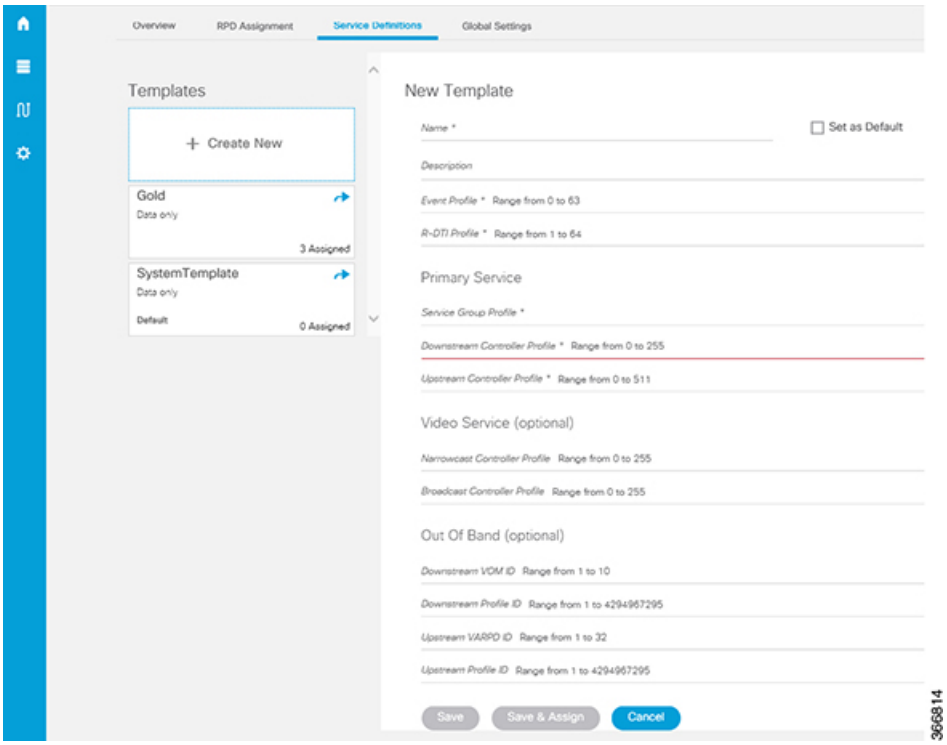
Following are the fields descriptions:

Name	Description
RPD MAC Address	MAC address of the RPD
CCAP Core	The Cisco cBR-8 router to which the RPD must connect to.
Core Interface	Complete name of the TenGigabitEthernet DPIC Interface to be used for Data Service.
Video Interface	Complete name of the TenGigabitEthernet DPIC Interface to be used for Video (Narrowcast) Service.
Broadcast Video Interface	Complete name of the TenGigabitEthernet DPIC Interface to be used for Broadcast Video Service. Cannot be same as the Video Interface.

Name	Description
Data Service Group	All RPDs with the same data service group share the Downstream controller for Data Service (Virtual Splitting for Data)
Narrowcast Video SG	All RPDs with the same video service group share the Downstream controller for Video Service (Virtual Splitting for Video).
Broadcast Video SG	Complete name of the TenGigabitEthernet DPIC Interface, which is used for broadcast video service. Should not be the same as the Video Interface.
Additional Cores	List of additional cores the RPD must connect to.
Service Template	Service Template as created in the Service Definition tab
Latitude	Latitude of the RPD (GPS coordinates)
Longitude	Longitude of the RPD (GPS coordinates)
RPD Name	Name for the RPD
RPD Description	Description for the RPD
Pre Configure	If you choose **true**, the Cisco Smart PHY application validates a pre configuration that is available on the Cisco cBR-8 router and applies the configuration immediately. This process saves the time in bringing the RPD online.

Service Definitions

Allows you to add, edit, delete, or assign service templates. Fields that are not marked as optional are mandatory.



Following are the fields descriptions:

Name	Description
Event Profile	RPD Event Profile Set
R-DTI Profile	Remote DOCSIS Timing Interface (R-DTI) Set
Service Group Profile	Pre-existing Cable Service Profile-Group on the CBR
Downstream Controller Profile	Primary Downstream CCAP Controller Profile
Upstream Controller Profile	Primary Upstream CCAP Controller Profile
Narrowcast Video Controller Profile	Downstream Video Controller Profile
Broadcast Video Controller Profile	Downstream Broadcast Video Controller Profile
Out Of Band	Out of Band Profile Parameters

Global Settings

Allows you to add, edit, or delete the software compatibility matrix. Fields that are not marked as optional are mandatory.

Software Compatibility—This window displays a compatibility matrix for the RPD software versions and the Cisco cBR software versions. The Smart PHY application detects the software incompatibility between

an RPD and a Cisco cBR-8 router, and alerts you about the incompatibility. After the alert appears, you can either manually upgrade the RPD software version or upgrade it through the Smart PHY application.

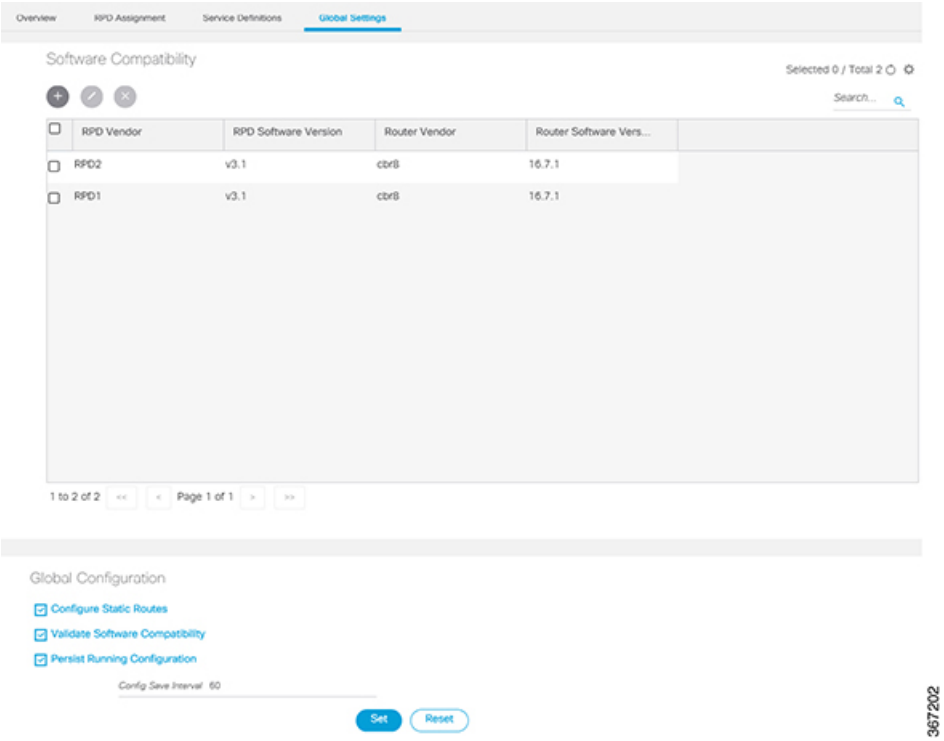
Table 1: Field Description for Software Compatibility Matrix

Name	Description
RPD Vendor	Name of the RPD vendor.
RPD Software Version	Software version running on the RPD.
Router Vendor	Name of the router vendor.
Router Software Version	Software version of the router.

Global Configuration

The **Global Configuration** section under the **Global Settings** menu provides the following options for you to configure on RPDs. You can choose the following functions according to your requirement.

- Configure Static Routes—If you enable this option, for interfaces with /31 (IPv4 networks) or /127 (IPv6 networks) configured on the DPIC, the Cisco Smart PHY application adds a static route configuration on the Cisco cBR-8 router.
- Validate Software Compatibility—If you enable this option, the Cisco Smart PHY application checks the compatibility between the RPD version and the Cisco cBR-8 router version specified in the table.
- Persist Running Configuration—If you enable this option, when the Cisco Smart PHY makes a change to the Cisco cBR-8 configuration, the Cisco Smart PHY makes the configuration persistent. This option allows you to make the changes persistent on the Cisco cBR-8 router at a specific interval.



Static Route

To route traffic and for communication between an RPD and a Cisco cBR-8 router, static routes to the Cisco cBR router are created when you configure the RPDs.

SmartPHY automatically creates a static route for the RPD if the DPIC interface is configured with a /31 (IPv4 networks) or /127 (IPv6 networks) subnet. The static route is determined by calculating the gateway IP address and routing traffic through the gateway for the RPD.

Note

- The DPIC must be a /31 subnet.
- Wait for the RPD to push the static route configuration.

Sample of a Cisco Smart PHY Generated Configuration

```
cable rpd <Internal UUID of the CBR>-5000.0000.0001
  identifier 5000.0000.0001
  core-interface Te3/1/0
    principal
    rpd-ds 0 downstream-cable 3/0/4 profile 0
    rpd-ds 0 downstream-oob-vom 1 profile 5
    rpd-us 0 upstream-cable 3/0/4 profile 0
    rpd-us 0 upstream-oob-varpd 2 profile 4
    rpd-ds 0 downstream-cable 3/0/5 profile 67
  r-dti 20
  rpd-event profile 0


cable fiber-node <next available fiber-node>
  downstream Downstream-Cable 3/0/4
```

```
upstream Upstream-Cable 3/0/4
downstream sg-channel 0 3
downstream-Cable 3/0/4 rf-channel 0 3
upstream sg-channel 0 Upstream-Cable 3/0/4 us-channel 0
service-group profile CBRServiceGroup
```

Admin

The Cisco Smart PHY application has two views under Admin. One for debugging and the other for managing users.

Admin Home

The Admin Home page has three tabs:

- Logs
- Traces
- Kubernetes

Cisco Smart PHY logs capture information about actions in the system as well as interactions with managed devices. You can download log documents for troubleshooting purposes. Cisco Smart PHY retains log documents for 12 hours. Cisco Smart PHY uses Kibana for logging. Kibana is an open source data visualization plug-in for Elasticsearch. Users with administrator privileges can create additional filters or change the time period for log retention by working directly in Kibana.

Admin Users

The Admin Users page allows you to view existing users and add new users. Exisitng user profiles can be edited or deleted.

Accessing Kibana Logs

You can access Kibana logs at `https://<HostOS_IP>:30604/kibana/app/kibana`.