

# Oracle® Communications IP Service Activator

Cisco CatOS Cartridge Guide

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This guide outlines the tasks involved in installing and configuring the Oracle Communications IP Service Activator Cisco CatOS cartridge.

## About This Guide

This guide consists of the following sections:

- [Cartridge Overview](#)
- [IP Service Activator Cisco CatOS Cartridge Features](#)
- [Installing the Cartridge](#)
- [Device Configuration](#)
- [Options Framework](#)

## Audience

This guide is intended for network managers and technical consultants responsible for implementing IP Service Activator within a network that uses Cisco devices.

## Accessing Oracle Communications Documentation

IP Service Activator for Oracle Communications documentation and additional Oracle documentation is available from Oracle Help Center:

<http://docs.oracle.com>

## Related Documents

For more information, see the following documents in the IP Service Activator documentation set:

- See *IP Service Activator Installation Guide* for system requirements and information on installing, upgrading and uninstalling IP Service Activator.
- See *IP Service Activator System Administrator's Guide* for information and procedures related the duties a system administrator performs in monitoring and managing IP Service Activator.

## Cartridge Overview

IP Service Activator cartridges enable you to support your existing services, emerging services, and business needs. The cartridges operate in conjunction with the IP Service Activator core product. For more information, see *IP Service Activator Concepts*.

## IP Service Activator Cisco CatOS Cartridge Features

The following tables list the features and services supported by the IP Service Activator Cisco CatOS cartridge.

### General IP Service Activator Features

[Table 1](#) lists the support for general IP Service Activator features on the Cisco CatOS cartridge.

**Table 1** General IP Service Activator Features

Area	IP Service Activator Feature	Supported on Cisco CatOS Cartridge
Configuration Protocol Support	Telnet	Yes
Configuration Protocol Support	Secure Shell (SSH)	Yes
Configuration Protocol Support	Simple Network Management Protocol (SNMP)	No
Configuration Protocol Support	Vendor Proprietary	No
Device Discovery	SNMP	Yes
Device Discovery	Discovery Module	No
Device Configuration	Configuration Audit	Yes
Device Configuration	Command Re-issue	Yes
Device Configuration	Auto ID Migration	Yes
Device Configuration	Save Running Configuration	Yes
Device Configuration	Configuration Version	Yes
Device Configuration	Configuration Options	Yes
Device Configuration	Synonyms	Yes
Device Configuration	Command Thresholding	Yes
Device Configuration	Threshold Activated Configuration Control	Yes
Supported Services	Interface Configuration Management	Partially
Supported Services	Quality of Service (QoS)	Partially
Supported Services	Layer 3 Multiprotocol Label Switching (MPLS) Virtual Private Network (VPN)	No
Supported Services	Point-to-Point Circuit Cross Connect (CCC)	No

**Table 1 (Cont.) General IP Service Activator Features**

<b>Area</b>	<b>IP Service Activator Feature</b>	<b>Supported on Cisco CatOS Cartridge</b>
Supported Services	Point-to-Point Virtual Leased Line (VLL) Martini	No
Supported Services	Virtual Private LAN Service (VPLS)	No
Supported Services	Service Assurance Agent (SAA)	No
Supported Services	Netflow	No
Supported Services	Dynamic User VPN	No
Supported Services	IPsec	No
Supported Services	Virtual Routing and Forwarding (VRF)-Aware IPsec	No
Supported Services	Label Switched Path (LSP)	No
Supported Services	Virtual local area network (VLAN)	Yes
Supported Services	Base Configuration Policies	No
Supported Services	Layer 2 VLL	No
Supported Services	Layer 2 QoS	Yes
Supported Services	QoS Attachment	No
Supported Services	VRF Route Maps	No
Supported Services	VPN and IP Multicast Module	No
Supported Services	Configuration Template Manager	Yes
SDK	Service Cartridge Software Development Kit (SDK)	Yes
SDK	Configuration Policy SDK	Yes

## VLAN

Table 2 lists the VLAN support on the Cisco CatOS cartridge.

**Table 2 VLAN Support**

<b>Area</b>	<b>IP Service Activator Feature</b>	<b>Supported on Cisco CatOS Cartridge</b>
VLAN (TLS L2 Site)	VLAN (TLS L2 Site)	No
VLAN (TLS L2 Site)	Tagged VLAN	No
VLAN (TLS L2 Site)	Untagged VLAN	No
VLAN Module	VLAN Module	No
VLAN Module	Tagged VLAN	No
VLAN Module	Untagged VLAN	No
VLAN Module	Queue-in-Queue VLAN	No
vlanDefinitions	vlanDefinitions	Yes
vlanDefinitions	VLAN State	Yes

**Table 2 (Cont.) VLAN Support**

<b>Area</b>	<b>IP Service Activator Feature</b>	<b>Supported on Cisco CatOS Cartridge</b>
vlanDefinitions	VLAN Media (Type): Ethernet	Yes
vlanDefinitions	Maximum Transmission Unit (MTU)	Yes
vlanDefinitions	Security Association Identifier (SAID)	Yes
vlanInterface	vlanInterface	Yes
vlanInterface	Tagged VLAN: Encapsulation Type	Yes
vlanInterface	Encapsulation Type: dot1 q	Yes
vlanInterface	Encapsulation Type: isl	Yes
vlanInterface	Tagged VLAN: Switchport No negotiate	Yes
vlanInterface	Tagged VLAN: Native VLAN	Yes
vlanInterface	Tagged VLAN: VLAN Range	Yes
vlanInterface	Untagged VLAN	Yes
vlanInterface	Queue-in-Queue VLAN	Yes

## Layer 2 QoS

Table 3 lists the Layer 2 QoS support on the Cisco CatOS cartridge.

**Table 3 Layer 2 QoS Support**

<b>IP Service Activator Feature</b>	<b>Supported on Cisco CatOS Cartridge</b>
catOSPolicingRule Configuration Policy	Yes
Policing Rule IP Classification Criteria	Yes
Classification Based on Trust Type	Yes
Classification Based on DiffServ Code Point	Yes
Classification Based on Source IPv4 Address	Yes
Classification Based on Destination IPv4 Address	Yes
Policing Rule Media Access Control (MAC) Classification Criteria	Yes
Classification Based on Trust Type	Yes
Classification Based on DiffServ Code Point	Yes
Classification Based on Source MAC Address	Yes
Classification Based on Destination MAC Address	Yes
Policing Rule IPX Classification Criteria	Yes
Classification Based on Trust Type	Yes
Classification Based on DiffServ Code Point	Yes

**Table 3 (Cont.) Layer 2 QoS Support**

IP Service Activator Feature	Supported on Cisco CatOS Cartridge
Classification Based on Source MAC Address	Yes
Classification Based on Destination MAC Address	Yes
Classification Based on Protocol	Yes
Classification Based on Source IPX Address	Yes
Classification Based on Destination IPX Address	Yes
rate-limit Configuration Policy	No
qosCosAttachment Configuration Policy	No

## Interface Configuration Management

Table 4 lists the Interface Configuration Management support for the Cisco CatOS cartridge.

**Table 4 Interface Configuration Management Support**

Area	IP Service Activator Feature	Supported on Cisco CatOS Cartridge
Backup Interface	Backup Interface Policy	No
Channelized Interface Creation	E1 Channelized Interface	No
Channelized Interface Creation	E1 Controller	No
Channelized Interface Creation	E3 Channelized Interface	No
Channelized Interface Creation	E3 Controller	No
Channelized Interface Creation	Synchronous Transport Module level-1 (STM1) Channelized Interface	No
Channelized Interface Creation	STM1 Controller	No
Channelized Interface Creation	T1 Channelized Interface	No
Channelized Interface Creation	T1 Controller	No
Channelized Interface Creation	T3 Channelized Interface	No
Channelized Interface Creation	T3 Controller	No
Cisco	Cisco Universal Interface	No
Cisco	Cisco Ethernet Port	Yes
Dialer List	Dialer List	No

**Table 4 (Cont.) Interface Configuration Management Support**

<b>Area</b>	<b>IP Service Activator Feature</b>	<b>Supported on Cisco CatOS Cartridge</b>
Data Link Switching (DLSW)	DLSW Device	No
DLSW	DLWS Ethernet Interface	No
DLSW	DLSW Token Ring Interface	No
Hot Standby Router Protocol (HSRP)	HSRP	No
Interface Creation	Loopback Interface	No
Interface Creation	Virtual Template Interface	No
Interface Creation	Basic Rate Interface (BRI)	No
Interface Creation	Dialer Interface	No
Interface Creation	Multilink Interface	No
Interface Decoration	POS Interface	No
Interface Decoration	Serial Interface	No
Multilink Point-to-Point (PPP)	PPP Multilink	No
Stack Group Bidding Protocol (SGBP)	SGBP	No
Sub Interface Creation	Asynchronous Transfer Mode (ATM) SubInterface	No
Sub Interface Creation	Frame Relay SubInterface	No
Sub Interface Creation	VLAN Sub Interface	No

## Layer 2 VPN

Table 5 lists the Layer 2 VPN support on the Cisco CatOS cartridge.

**Table 5 Layer 2 VPN Support**

<b>Area</b>	<b>IP Service Activator Feature</b>	<b>Supported on IP Service Activator Cisco CatOS cartridge</b>
Layer 2 VPN Support	Layer 2 VPN Support	No
Topology	Mesh	No
Topology	Hub and Spoke	No
Topology	Management	No
Topology	H-VPLS	No
Signaling	BGP	No
Signaling	LDP	No
Discovery	Auto-discovered	No
Discovery	Explicit	No
MAC Table	Table size	No

**Table 5 (Cont.) Layer 2 VPN Support**

<b>Area</b>	<b>IP Service Activator Feature</b>	<b>Supported on IP Service Activator Cisco CatOS cartridge</b>
MAC Table	Limit action	No
MAC Table	Limit notification	No
MAC Table	Aging time	No
MAC Table	Aging type	No
VSI	Profile	No
VSI	Route distinguisher: explicit	No
VSI	Route distinguisher: auto	No
VSI	Bridge domain	No
VSI	Bridge group	No
VSI	Ve range	No
VSI	Ve ID	No
VSI	VPN ID	No
Cross-connect	Group name	No
Cross-connect	Virtual circuit ID	No
Cross-connect	Point-to-point name	No
Cross-connect	Pseudowire name	No
Neighbor	IP Address (IPv4)	No
Neighbor	Pseudowire class	No
Neighbor	Pseudowire ID	No

## Cisco Hardware and Software

For complete information about the Cisco platforms supported with IP Service Activator Cisco CatOS cartridge, see the *IP Service Activator Installation Guide*.

## Operating Systems

For complete information on the supported operating systems for the Cisco CatOS cartridge, see the *IP Service Activator Installation Guide*.

## Installing the Cartridge

For cartridge installation procedures, see *IP Service Activator Installation Guide*.

## Installing Configuration Policies

IP Service Activator supports extensible configuration policies that are visible through the UI. The configuration policies include one CFG file and one or more compressed HTML files. Configurations are delivered to the network through these configuration policies. For more information on configuration policies, see IP Service Activator online Help.

## Device Configuration

To configure Cisco devices, see the Cisco documentation:

<http://www.cisco.com/cisco/web/psa/default.html?mode=prod>

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**Important:** If you use the Options Framework, Oracle recommends that you configure the options at deployment.

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## Supported Authentication Methods

The IP Service Activator Cisco CatOS cartridge supports the following authentication methods on all devices:

- Telnet with TACACS+
- SSH with password authentication

## Sample Configuration

Following is a sample Cisco device configuration:

```
!  
#system  
set system name rot6509-2  
!  
#!  
#mac address reduction  
set spantree macreduction enable  
!  
#vtp  
set vtp mode transparent  
set vlan 1 name default type ethernet mtu 1500 said 100001 state active  
set vlan 46 name test_46 type ethernet mtu 1500 said 100046 state active  
set vlan 67 name nm type ethernet mtu 1500 said 100067 state active  
set vlan 69 name vlan69 type ethernet mtu 1500 said 10069 state suspend  
set vlan 87 name k,nlm,n type ethernet mtu 1500 said 79 state active  
set vlan 89 name m,rt,er type ethernet mtu 1500 said 89 state active  
set vlan 99 name mgmt type ethernet mtu 1500 said 100099 state active  
set vlan 103 name vlan103 type ethernet mtu 1500 said 1001 state active  
set vlan 147 name bnmbnm type ethernet mtu 789 said 1000 state active  
set vlan 199 name vlan198 type ethernet mtu 1500 said 100199 state active  
set vlan 678 name vlan678 type ethernet mtu 1500 said 1000678 state active  
set vlan 1002 name fddi-default type fddi mtu 1500 said 101002 state active  
set vlan 1004 name fddinet-default type fddinet mtu 1500 said 101004 state active  
stp ieee  
set vlan 1005 name trnet-default type trbrf mtu 1500 said 101005 state active stp  
ibm  
set vlan  
2,5-6,20-21,30,45,50,60,68,71,75,80,100,107,141,150,202,250-251,345,349,458,465-46  
8,500,555,856  
set vlan 1003 name token-ring-default type trcrf mtu 1500 said 101003 state active  
mode srb aremaxhop 7 stemaxhop 7 backupcrf off  
!
```



## Options Framework

The options framework in the Cisco CatOS cartridge controls the configuration style for different device type and CatOS operating system version combinations. These options are registered by the capabilities file in the **MIPSA\_registry.xml** file. A sample file is displayed below:

```
...
<!-- CiscoCatos 6500 device series with IOS 7.6(15)-->
<cartridgeUnit>
<name>com.metasolv.serviceactivator.cartridges.ciscoCatos.units.cu1.wsc6509.7.6(15)
</name>
<driverType>catos</driverType>
<deviceType>Cisco wsc6509</deviceType>
<osVersion>7.6(15)</osVersion>
<smToDmQuery>com/metasolv/serviceactivator/cartridges/ciscoCatos/units/cu1/sm2dm.x
q</smToDmQuery>
<dmValidation>com/metasolv/serviceactivator/cartridges/ciscoCatos/units/cu1/dmVali
dation.xq</dmValidation>
<dmToCliQuery>com/metasolv/serviceactivator/cartridges/ciscoCatos/units/cu1/annota
tedDm2Cli.xq</dmToCliQuery>
<capabilities>com/metasolv/serviceactivator/cartridges/ciscoCatos/capabilities/cat
os_default.xml</capabilities>
<options>com/metasolv/serviceactivator/cartridges/ciscoCatos/options/6500-7.6_
15.xml</options>
<errorMessages>com/metasolv/serviceactivator/cartridges/ciscoCatos/messages/errorM
essages.xml</errorMessages>
<warningMessages>com/metasolv/serviceactivator/cartridges/ciscoCatos/messages/warn
ingMessages.xml</warningMessages>
<successMessages>com/metasolv/serviceactivator/cartridges/ciscoCatos/messages/succ
essMessages.xml</successMessages>
</cartridgeUnit>
...
```

The `<options>` entry references an option configuration file with the path relative to *ServiceActivatorHome/Config/networkProcessor*. In this example, the **6500-7.6\_15.xml** file is located in the following directory:

*ServiceActivatorHome/Config/networkProcessor/com/oracle/ipsa/options*. A sample file is displayed below:

```
- <base:options xsi:type="CartridgeOptions"
xmlns="http://www.metasolv.com/serviceactivator/ciscoCatos/options"
xmlns:base="http://www.metasolv.com/serviceactivator/options"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

<cartridge.ciscoCatos.l2qos.policer.burstRate.maximum>256000</cartridge.ciscoCatos.
.l2qos.policer.burstRate.maximum>

<cartridge.ciscoCatos.l2qos.copyAclConfig.fileName>6500.acl</cartridge.ciscoCatos.
l2qos.copyAclConfig.fileName>
</base:options>
```

**Table 6** details the configuration options for the Cisco CatOS cartridge. For the options files to be valid, you must enter the options definitions in the order below. The default value is used if an option is not defined.

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**Note:** Changing the value of an option for a device that has existing configurations provisioned by IP Service Activator could result in the configurations being removed and re-added using the new configuration style.

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**Table 6 Configuration Options**

Option	Default Value	Possible Values	Description
cartridge.ciscoCatos.vlanidvalue.minimum	1	0 to 4095	Cisco CatOS VLAN ID minimum value Minimum acceptable VLAN ID value. <b>Impact:</b> A fault will be raised if the VLAN ID value is less than the minimum value.
cartridge.ciscoCatos.vlanidvalue.maximum	4094	0 to 4095	Cisco CatOS VLAN ID maximum value Maximum acceptable VLAN ID value. <b>Impact:</b> A fault will be raised if the VLAN ID value is greater than the maximum value.
cartridge.ciscoCatos.excludedvlanidvalue.minimum	4095	0 to 4095	Cisco CatOS Excluded VLAN ID minimum value The lower end of the VLAN ID exclusion range. <b>Impact:</b> A fault will be raised if the VLAN ID value is within the exclusion range.
cartridge.ciscoCatos.excludedvlanidvalue.minimum1005	4095	0 to 4095	Cisco CatOS Excluded VLAN ID minimum value for tagged ports The lower end of the VLAN ID exclusion range for tagged ports. <b>Impact:</b> A fault will be raised if the VLAN ID value is within the exclusion range.
cartridge.ciscoCatos.excludedvlanidvalue.maximum	0	0 to 4095	Cisco CatOS Excluded VLAN ID maximum value The upper end of the VLAN ID exclusion range. <b>Impact:</b> A fault will be raised if the VLAN ID value is within the exclusion range.

**Table 6 (Cont.) Configuration Options**

Option	Default Value	Possible Values	Description
cartridge.ciscoCatos.l2qos.policer.burstRate.maximum	256000	0 to 256000	<p>Cisco CatOS Policing Rule maximum burst rate</p> <p>The maximum allowable burst rate for L2 QoS policing rules.</p> <p><b>Impact:</b> A fault will be raised if the burst rate is greater than the maximum value.</p>
cartridge.ciscoCatos.l2qos.copyAclConfig.fileName	None	<i>filename.acl</i>	<p>Cisco CatOS ACL configuration file</p> <p>The file name to use when saving the access list configuration.</p> <p>This option supports the device name pattern. When the device name pattern "%deviceName%" appears in the option, it is replaced with the real device name at runtime. For example, the option: &lt;cartridge.ciscoCatos.l2qos.copyAclConfig.fileName&gt;slot0:%deviceName%.acl&lt;/cartridge.ciscoCatos.l2qos.copyAclConfig.fileName&gt;, generates this command for device rot4006-1 at runtime: copy acl-config slot0:rot4006-1.acl.</p>
cartridge.ciscoCatos.l2qos.macAcl.trust-dscp.isSupported	true	true   false	<p>Cisco CatOS trust-dscp support for the macAcl command as set qos acl mac maqcACL trust-dscp</p> <p>Indicates if the set qos acl mac maqcACL trust-dscp command is supported for macAcl configurations in L2 QoS policing rules</p> <ul style="list-style-type: none"> <li>■ true: command set qos acl mac maqcACL trust-dscp will be sent to the device.</li> <li>■ false: fault trust-dscp is not supported with MAC Classification Rule in catOSPolicingRule Policy is raised by IP Service Activator.</li> </ul> <p><b>Impact:</b> Changing this value changes the support for set qos acl mac maqcACL trust-dscp commands.</p>

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## Document Revision History

The following table lists the revision history for this guide.

Version	Date	Description
E61105-03	June 2016	Documentation updates.
E61105-02	October 2015	Documentation updates.
E61105-01	July 2015	Initial release.

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