

AutoConf and Interface Template on Cisco Catalyst Switches

With the number of devices and types of devices connecting in an enterprise network increasing, it has become even more important for network operators to have easy ways to configure these changing workspace environments. Bloated and inflexible configuration options can create usability challenges.

Cisco has come up with AutoConf, which can be used to configure the switch ports automatically on detection of an end device. The AutoConf solution provides a suite of capabilities that help deploy Cisco® Catalyst® switches and manage them effectively at very low operating costs.

AutoConf falls under the umbrella of the Cisco Smart Operations solution. Smart Operations is a comprehensive set of capabilities that can simplify and improve LAN switch deployment. Smart Operations help organizations deliver operational excellence and scale services on the network. AutoConf is the next-generation feature to perform these functions.

While deploying the network, the pain point today is manual configuration of a switch to handle a certain device on the port and repeating the entire operation if the device moves across ports.

With manual configuration, after the device is disconnected, removal of the stale configuration needs to be taken care of. Not doing so can cause the next device connected to the port to not function properly. Keeping track of these ports and cleaning up is difficult. AutoConf automates this process by reverting to the previously applied configuration on device disconnect. This allows for an easy transition backward after AutoConf has been turned off.

This AutoConf functionality removes any hard binding between the device and the interface. Devices can be connected anywhere, and Cisco IOS® Software applies the configuration dynamically.

Advantages of Next-Generation AutoConf and Interface Template

- Simplified running configuration
- Parsing at definition time
- Built-in templates
- Configuration rollback
- Precedence management
- Integration with session-aware networking

Cisco Catalyst Platforms That Support AutoConf from Cisco IOS-XE Software Release 3.6.0E/IOS15.2(2)E

- Cat2K: Cisco Catalyst 2960 Series Switches
- Cat3K: Cisco Catalyst 3750 and 3560 Series Switches
- Cat4K: Cisco Catalyst 4500 Series Switches
- Cisco compact series of switches

Using Device Classifier to Identify Devices Connected

Device Classifier uses Cisco Discovery Protocol, Link Layer Discovery Protocol (LLDP), Dynamic Host Configuration Protocol (DHCP), HTTP, and MAC address-based detection methods to identify the type and capability of the end device. Device Classifier provides improved device classification capabilities and accuracy and increased device visibility for enhanced configuration management. **Device classification is enabled by default.** AutoConf uses the device classification information gleaned from Cisco Discovery Protocol, LLDP, DHCP, and MAC OUI from Device Classifier.

Turning on AutoConf

AutoConf is a solution used to manage port configurations for data/voice VLANs, quality-of-service parameters, storm control, and MAC-based port security on switches deployed in the network access layer. Each of these configurations has been chosen and grouped into templates by Cisco, creating best-practice configurations.

The switch automatically applies the best-practice configurations needed on the switch ports to enable the efficient performance of each directly connected end device. These sets of interface configurations in the form of a shell function are referred to as templates. No configurations are needed from the end device side.

Disabling AutoConf on Interface Level While It Is Enabled Globally

Enable/Disable AutoConf Globally

```
AC(Config)# autoconf enable
AC(Config)# no autoconf enable
```

Disable AutoConf at Interface Level While Enabled Globally

```
AC(Config)# interface Gi1/0/1
AC(Config-if)# access-session inherit disable autoconf
```

Important: By default this feature is disabled globally

Table 1 describes enabling AutoConf functionality.

Table 1. Enabling AutoConf Functionality

Global	Interface Level	AutoConf Status
Disable	Disable	This is default status. No automatic configurations are applied when an end device is connected.
Enable	Enabled by default	When enabled at global, interface level is enabled by default. Built-in template configurations are applied based on device detected on all interfaces.
Enable	Disable	Enabled at global level. Disabled at interface level. No automatic configurations are applied when an end device is connected to the interface where disable is configured.

Throughout this document, “switch” refers to a Cisco Catalyst switch and “end devices” refers to IP phones, wireless access points (autonomous and lightweight), digital media players, IPVSC cameras, telepresence video endpoints, printers, and laptops/desktops.

AutoConf and Built-In Template

AutoConf uses a set of built-in triggers and built-in templates provided by Cisco IOS Software. The built-in templates are designed based on best practices for interface configurations.

Interface configurations that the user wants to apply can be grouped in the form of a template with any name. These templates are referred to as user-defined templates. User-defined templates can be defined on the switch or stored on flash or a remote file server. User-defined templates can be mapped to any built-in or user-defined trigger. Built-in templates can be modified by the user to satisfy their specific configurations, limiting the need to create a new template.

Built-In Autoconf Templates

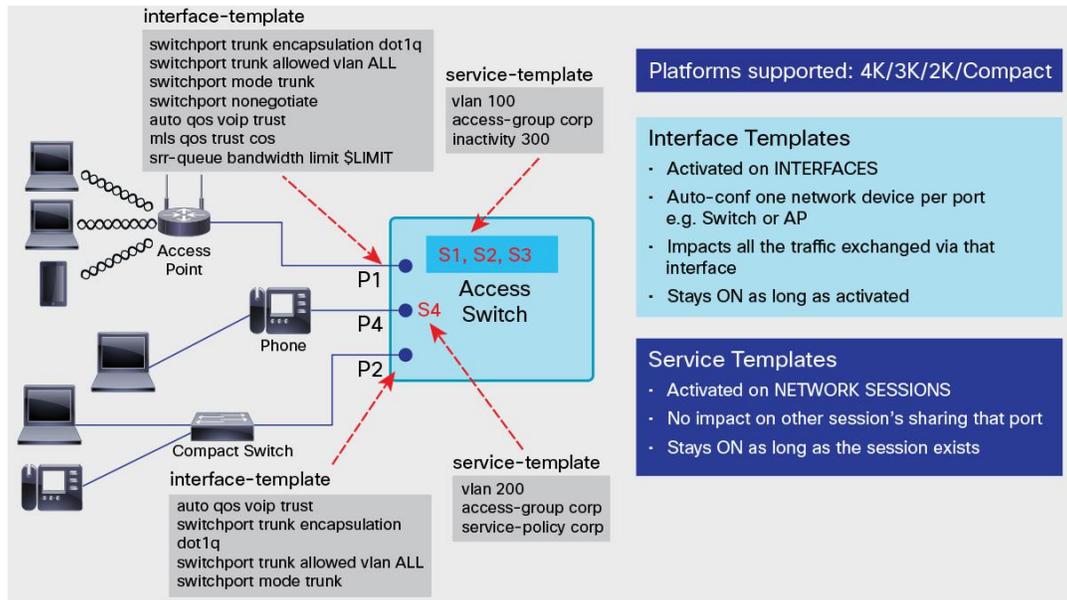
- AP_INTERFACE_TEMPLATE
- DMP_INTERFACE_TEMPLATE
- IP_CAMERA_INTERFACE_TEMPLATE
- IP_PHONE_INTERFACE_TEMPLATE
- LAP_INTERFACE_TEMPLATE
- MSP_CAMERA_INTERFACE_TEMPLATE
- MSP_VC_INTERFACE_TEMPLATE
- PRINTER_INTERFACE_TEMPLATE
- TP_INTERFACE_TEMPLATE

Use Cases

- Handling unclassified devices
- Using service template use with wireless group
- Modifying built-in templates for Cisco endpoints connected to switches
- Handling AutoConf stickiness

Figure 1 shows an end to end Interface and Service template configuration example

Figure 1. Service Template Configuration



The code sample in Figure 2 shows a sample of derived template configuration

Figure 2. Derived Template Configuration

```
3750X(config-if)#source template DMP_INTERFACE_TEMPLATE
3750X(config-if)# end
3750X# show derived-config interface Gig 1/0/10
Derived configuration : 249 bytes
!
interface GigabitEthernet1/0/10
switchport mode access
switchport block unicast
switchport port-security
srr-queue bandwidth share 1 30 35 5
priority-queue out
mls qos trust dscp
spanning-tree portfast
spanning-tree bpduguard enable
end
```

The code sample in Figure 3 shows **configuration manually configured on interface configuration**

Figure 3. Manual Interface Configuration

```
3750X# show run interface Gig 1/0/10
Building configuration...
Current configuration : 79 bytes
!
interface GigabitEthernet1/0/10
 source template DMP_INTERFACE_TEMPLATE
end
```

Summary

AutoConf and interface templates are part of the Cisco Smart Operations suite of features. They enhance Auto Smart Port features to provide users with flexibility to configure access ports.

For more details, refer to the configuration guide at:

<http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/ibns/configuration/15-e/ibns-15-e-book/ibns-autoconf.html>

<http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/ibns/configuration/15-e/ibns-15-e-book/ibns-int-temp.html>



Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: www.cisco.com/go/trademarks. Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)