Cisco Nexus 9000 Series NX-OS Smart Channel Configuration Guide, Release 10.4(x)

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Preface

This preface includes the following sections:

- Audience, on page v
- Document Conventions, on page v
- Related Documentation for Cisco Nexus 9000 Series Switches, on page vi
- Documentation Feedback, on page vi
- Communications, Services, and Additional Information, on page vi

Audience

This publication is for network administrators who install, configure, and maintain Cisco Nexus switches.

Document Conventions

Command descriptions use the following conventions:

Convention	Description
bold	Bold text indicates the commands and keywords that you enter literally as shown.
Italic	Italic text indicates arguments for which you supply the values.
[x]	Square brackets enclose an optional element (keyword or argument).
[x | y]	Square brackets enclosing keywords or arguments that are separated by a vertical bar indicate an optional choice.
{x | y}	Braces enclosing keywords or arguments that are separated by a vertical bar indicate a required choice.
[x {y | z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.

Convention	Description
`variable`	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string includes the quotation marks.

Examples use the following conventions:

Convention	Description
`screen font`	Terminal sessions and information the switch displays are in screen font.
`boldface screen font`	Information that you must enter is in boldface screen font.
italic screen font	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Related Documentation for Cisco Nexus 9000 Series Switches

The entire Cisco Nexus 9000 Series switch documentation set is available at the following URL:

http://www.cisco.com/en/US/products/ps13386/tsd_products_support_series_home.html

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to nexus9k-docfeedback@cisco.com. We appreciate your feedback.

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
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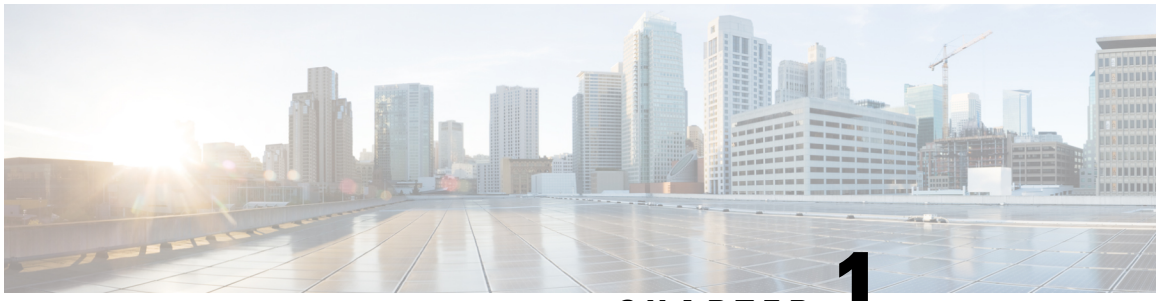
Cisco Bug Search Tool

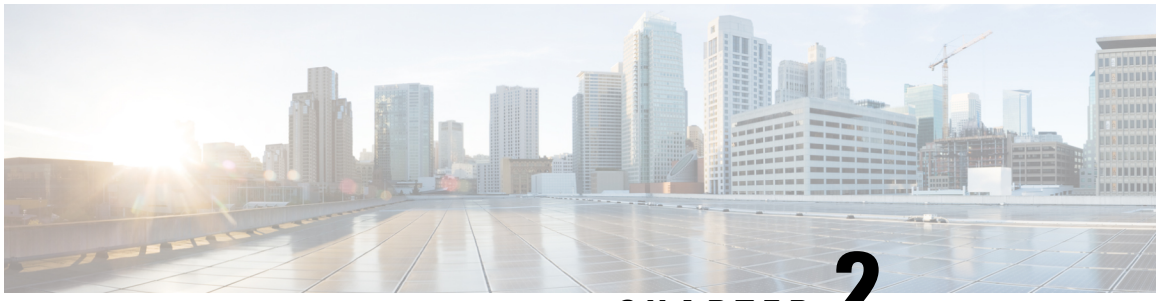
Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

Preface



CHAPTER 1

New and Changed Information



CHAPTER 2

Overview

This chapter describes the features of the NX-OS Smart Channel.

- Licensing Requirements, on page 3
- About Smart Channel, on page 3
- Topology Examples for Smart Channel , on page 4
- Prerequisites for Smart Channel, on page 6
- Guidelines and Limitations for Smart Channel, on page 7
- Default Settings for Smart Channel, on page 7

Licensing Requirements

For a complete explanation of Cisco NX-OS licensing recommendations and how to obtain and apply licenses, see the *Cisco NX-OS Licensing Guide* and the *Cisco NX-OS Licensing Options Guide*.

About Smart Channel

Smart channel is a hardware-based, multi-terabit solution for the Layer 2 traffic distribution, load balancing, and redirection on the Cisco Nexus switches. This feature is supported on the Cisco Nexus 9372PX, 93108TC-EX, and the Cisco Nexus 9516 switches.

Note Smart channel feature is not supported on Cisco 9500 EX / FX line cards.

Smart channel is an aggregation of multiple physical links that creates a single logical link. You can bundle up multiple physical links into a port group to provide an increased bandwidth (an aggregate of the multiple physical links) and redundancy.

If one port within a smart channel fails, the traffic switches to the remaining ports in the smart channel.

Smart channel allows you to create a cluster of transparent mode appliances.

Smart Channel Features

The smart channel features are as follows:

- Multi-terabit solution at line rate
- Simplified provisioning and ease of deployment
- Transparency to end device and stateless protocol benefits
- Removes the requirement for an expensive external load balancer

Benefits of Smart Channel

The benefits of smart channel are as follows:

- Simultaneous redirection and load balancing
- IP-stickiness and resiliency
- Health monitoring
- Removes the requirement for an expensive external load balancer
- Hashing does not depend on the wiring or the port numbering
- Every port on the switch is used for load balancing and traffic redirection
- Automatic failure handling of servers or appliances

Examples of the Deployment Use Cases

Examples of the deployment use cases for the smart channel feature are as follows:

- Load balances to a pool of firewalls.
- Scales the VDS-TC (video-caching) solution.
- Scales the transparent mode devices.

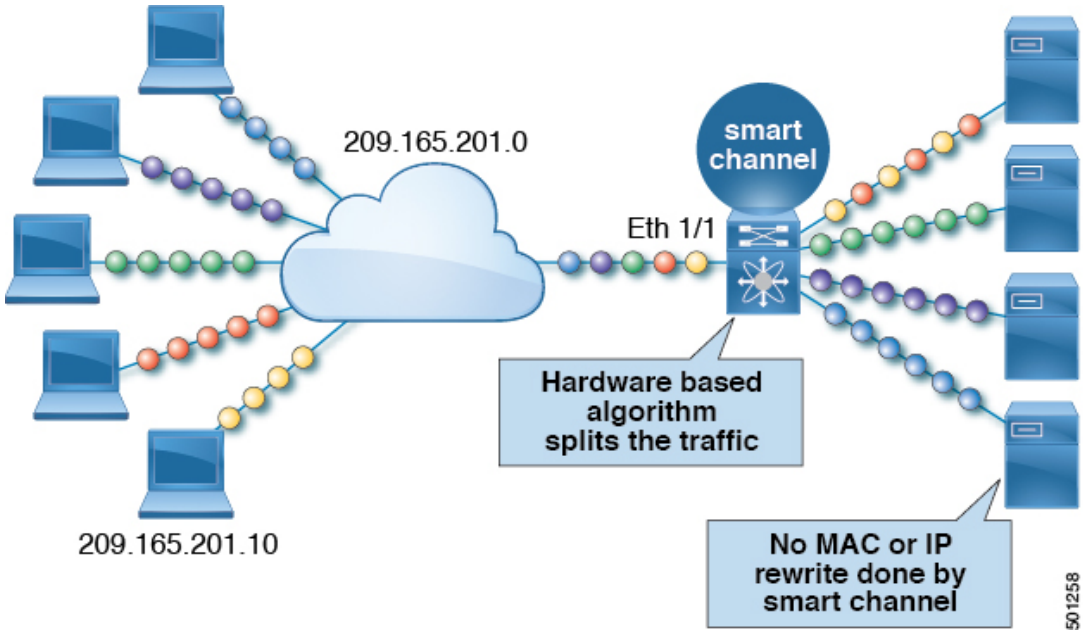
Topology Examples for Smart Channel

This section displays the following examples:

- Basic topology for smart channel
- Use case of a smart channel configuration
- Fail-action for resilient hashing

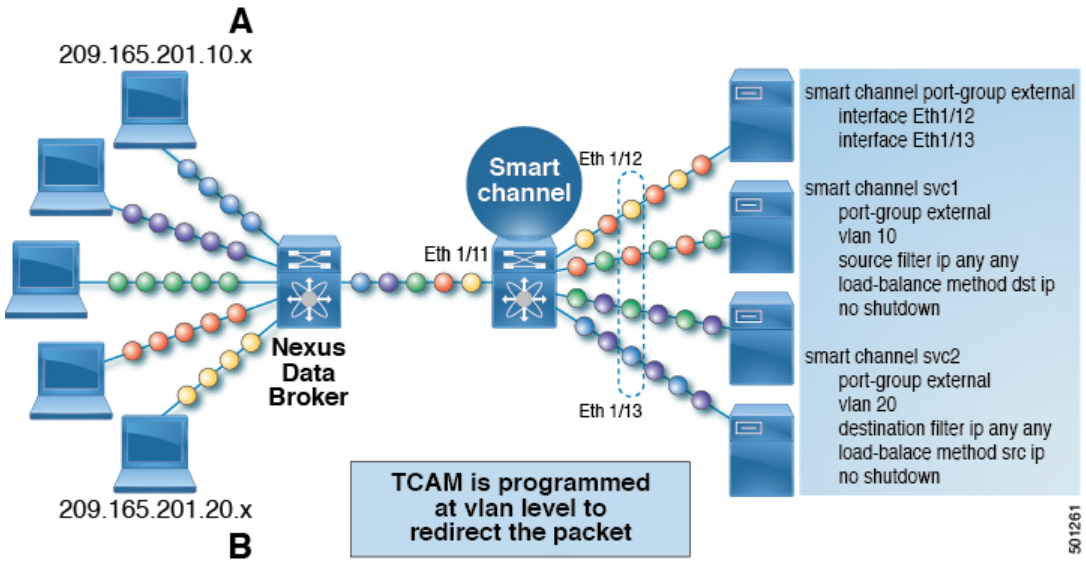
You can use the smart channel feature to load balance traffic to appliances used in a monitoring network. The following figure shows the basic topology, where the traffic is sent to the appliances where you need to load balance the traffic towards, such as the IPS or the IDS devices.

Figure 1: Standard Topology for Smart Channel



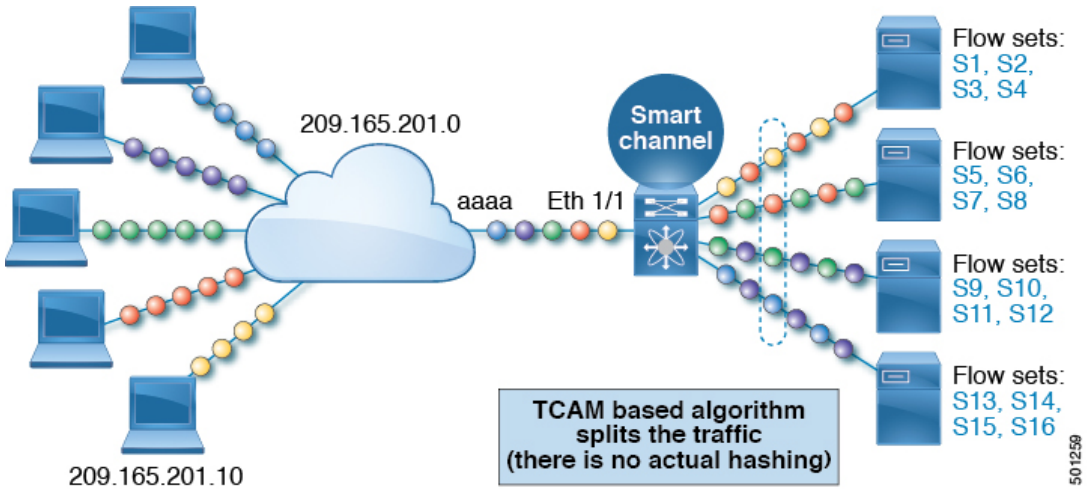
The following example shows a typical use case of smart channel in a network where the traffic is spanned from the production environment to the monitoring environment. In this example, we are using the Cisco Nexus Data Broker to send copy of the monitoring traffic and scale monitoring networks.

Figure 2: Use Case for a Smart Channel Configuration



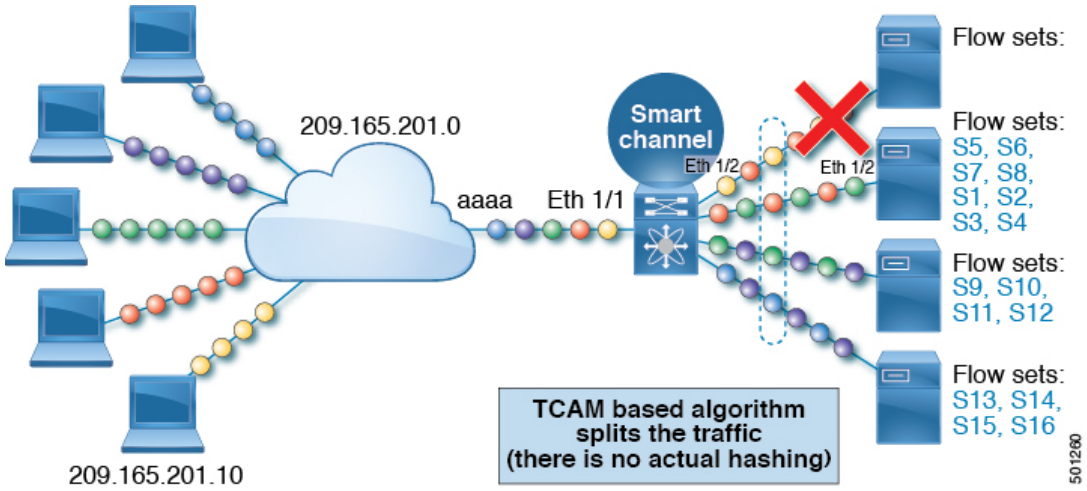
The following example shows the fail-action of a smart channel configuration:

Figure 3: Fail-Action of a Smart Channel Configuration



The following example shows the fail-action of a smart channel configuration:

Figure 4: Fail-Action of a Smart Channel Configuration



Prerequisites for Smart Channel

Smart channel has the following prerequisite:

- You must ensure that an enough TCAM size has been allocated to the VACL. To verify the TCAM size, use the **sh hardware access-list tcam region** command. If the appropriate TCAM size is not allocated, use the **hardware access-list tcam region** *VACL size additional of 256* command to allocate the appropriate TCAM size.

Guidelines and Limitations for Smart Channel

Smart channel has the following configuration guidelines and limitations:

- Cisco Nexus 9372PX, 93108TC-EX, and the Cisco Nexus 9516 switches support smart channel servicing.
- This feature is supported for the Cisco Nexus 9372PX, 93108TC-EX, and the Cisco Nexus 9516 switches.

Note Smart channel feature is not supported on Cisco 9500 EX / FX / R line cards.

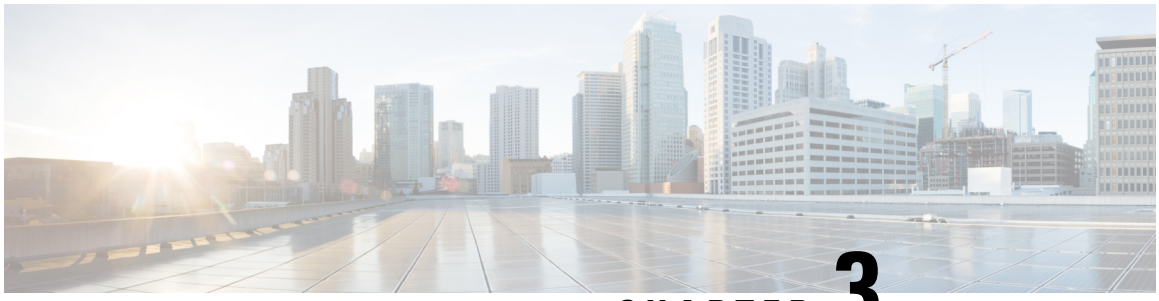
- This feature is supported for the Cisco Nexus C93108TC-EX beginning Cisco NX-OS Release 9.2 (x).
- Smart channel does not support the vPC, port channel, and the L3 interfaces.
- Only the port group interfaces in a trunk or access mode are supported.
- You must not share the smart port-group to more than one service when the services have the access configuration.
- Ensure that the TCAM size is equal to the sum of the number of the configured VLANs on the service by the number of buckets.
- Ensure that the smart channel service does not have the same load balancing method (load-balance method src ip) and the configuration of the (source filter ip any any).
- Ensure that the port-group to be added to the smart channel service has been configured.

Default Settings for Smart Channel

The following table lists the default settings for the smart channel parameter.

Table 1: Default Smart Channel Parameter

Parameters	Default
Smart channel	Disabled



CHAPTER 3

Configuring Smart-Channel

This chapter describes how to configure smart-channel on Cisco NX-OS devices.

This chapter includes the following sections:

- Enabling Smart Channel, on page 9
- Configuring Port Groups, on page 10
- Configuring the Smart Channel Service, on page 11
- Verifying the Smart Channel Configuration, on page 12

Enabling Smart Channel

You must enable the smart channel feature before you can configure the smart channel services on the device.

SUMMARY STEPS

1. **configure terminal**
2. [**no**] **feature smart-channel**
3. (Optional) **show feature | grep smart-channel**
4. (Optional) **copy running-config startup-config**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	[**no**] **feature smart-channel** **Example:** `switch(config)# feature smart-channel`	Enables or disables smart channel. By default, smart channel is disabled.
Step 3	(Optional) **show feature	grep smart-channel** **Example:**	Displays the status of the smart channel configuration.

	Command or Action	Purpose
	`switch(config-if)# show feature | grep smart-channel`	
Step 4	(Optional) **copy running-config startup-config** **Example:** `switch(config)# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Configuring Port Groups

After you enable smart channel, you must create a port group and configure active interfaces on that group.

SUMMARY STEPS

1. **configure terminal**
2. [**no**] **smart-channel port-group** *port-group-name*
3. **interface ethernet** *type slot/port*
4. (Optional) **copy running-config startup-config**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	[**no**] **smart-channel port-group** *port-group-name*
	Example:
	`switch(config)# smart-channel port-group Webservers`
	`switch(config-port-group)#`
		Creates or deletes a port group.

Step 3	Required: **interface ethernet** *type slot/port*
	Example:
	`switch(config)# interface ethernet 3/1`
	`switch(config-if)#`
		Configures the active interfaces on the port group.

Step 4	(Optional) **copy running-config startup-config** **Example:** `switch(config-port-group)# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Configuring the Smart Channel Service

To configure the smart channel service, you must do the following:

1. Configure the service name
2. Configure the VLAN/source/destination filters
3. Associate the port group to the smart channel service
4. Specify the load distribution scheme
5. Activate the smart channel service

Before you begin

You must enable the smart channel feature before you configure the smart channel service.

Note Beginning from Cisco Nexus NX-OS Release 9.3(3), feature Smart-channel is not supported. It is recommended to take necessary actions while upgrading from any previous release to 9.3(2) or any newer versions.

SUMMARY STEPS

1. **configure terminal**
2. [**no**] **smart-channel** *service-name*
3. [**no**] **access vlan** *access-vlan* | **vlan** *vlan-range*
4. [**no**] **port group** *port-group-name*
5. [**no**] **load-balance method** [*src* | *dst*]
6. [**no**] **destination filter ip** *any* [*any*]
7. [**no**] **source filter** [**ip***anyany*]
8. [**no**] **load-balance method** [*src* | *dst*] **Bucket** *B*
9. **no shut**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	Required: [**no**] **smart-channel** *service-name*
	Example:
	`switch(config)# smart-channel WebTraffic`
	`switch(config-smart-channel)#`
		Configures or disables the smart channel service.

	Command or Action	Purpose

Step 3	[**no**] **access vlan** *access-vlan* | **vlan** *vlan-range*
	Example:
	`switch(config-smart-channel)# access vlan 10-20`
	`switch(config-port-group)#`
		Configures a list of VLANs for the smart channel service. While the access VLANs create the smart channel in an access mode, the VLANs in the VLAN range creates the smart channel in the trunk mode.

Step 4	[**no**] **port group** *port-group-name*
	Example:
	`switch(config-smart-channel)# port group WEBSERVERS`
	`switch(config-smart-channel)#`
		Associates a port-group with the smart channel service.

Step 5	[**no**] **load-balance method** [*src* | *dst*]
	Example:
	`switch(config-smart-channel)# load-balance method src-ip`
	`switch(config-smart-channel)#`
		Configures the load balancing method.

Step 6	[**no**] **destination filter ip** *any* [*any*]
	Example:
	`switch(config-smart-channel)# destination filter ip any any`
	`switch(config-smart-channel)#`
		Configures the selected destination subnets.

Step 7	[**no**] **source filter** [**ip***anyany*]
	Example:
	`switch(config-smart-channel)# source filter ip any any`
	`switch(config-smart-channel)#`
		Configures the selected source subnets.

Step 8	[**no**] **load-balance method** [*src* | *dst*] **Bucket** *B*
	Example:
	`switch(config-smart-channel)# load-balance method src Bucket 16`
	`switch(config-port-group)#`
		Configures the load balancing method.

Step 9	**no shut**
	Example:
	`switch(config-smart-channel)# no shut`
	`switch(config-smart-channel)#`
		Activates the smart channel service.

Verifying the Smart Channel Configuration

Smart Channel Show Commands

To display the smart channel configuration, perform one of the following tasks:

SUMMARY STEPS

1. **show smart-channel** *service-name*
2. **show vlan access-list** *vlan access-map name*
3. **show running-config smart-channel** [**all**]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**show smart-channel** *service-name*	Displays the smart channel configuration status.
Step 2	**show vlan access-list** *vlan access-map name*	Displays the statistics for a smart channel service.
Step 3	**show running-config smart-channel** [**all**]	Displays the running configuration for smart channel.