Service Groups

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This module explains the Service Group feature and tell you how to use it.The Service Group feature allows network administrators to create service groups, add members (such as service instances) to those service groups, and apply service policies (also known an policy maps) to those newly created groups. The service policies (policy maps) contain the aggregate features (such as traffic policing and queueing) to be applied to the groups in compliance with the Service-Level Agreement (SLA) negotiated between the service provider and the subscribers.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Restrictions for Service Groups

For Cisco IOS Release12.2(33)SRE, the following restrictions apply:

- This feature is supported only on the Cisco IOS 7600 series router.
- Layer 3 subinterfaces are not supported.

Note For additional restrictions for the Cisco 7600 series routers and the line cards used on the router, see both the Cisco 7600-ES20 Ethernet Line Card Configuration Guide and the Cisco 7600 Series Ethernet Services + Line Card Configuration Guide.

- From Cisco IOS Release 15.1(1)S onwards, subinterfaces and access subinterfaces are supported on Ethernet service + line cards. A service group can have service instance members, subinterface members, or a mix of the two under the same main interface on these line cards.

Information About Service Groups

Service Instance Definition

A service instance is a configuration object (container) that holds all management and control plane attributes and parameters that apply to that service instance on a per-port basis. Different service instances that correspond to the same Ethernet Virtual Connection (EVC) must share the same name. Service instances are associated with a global EVC object through their shared name.

Benefits of Service Groups

Th Service Groups feature allows you to create service groups and apply aggregate features to those service groups. For Cisco IOS Release 12.2(33)SRE on a Cisco 7600 series router, a Quality of Service (QoS) policy map is the only feature that can be applied to service groups.

Service Groups QoS Policy Maps and Automatic load balancing

For Cisco IOS Release 12.2(33)SRE on Cisco 7600 series router, only QoS service policies (policy maps) on service groups or group members are supported. A QoS policy map may be configured on service groups (or on individual service group members) on an interface or a port channel. On a port channel, the service group feature enables you to implement load balancing by distributing the multiple service instances among the different member links.

When a member link goes down, automatic load balancing is triggered on the port channel. Load balancing redistributes the EVCs to the remaining member links on the port channel, while maintaining the original QoS policy maps. For example, consider that two QoS policy maps, QoS1 and QoS2, implemented on two service groups, SG1 and SG2, respectively:

- Service group SG1 is connected to the network through link M1.
- Service group SG2 is connected to the network through link M2.

If the M2 link goes down, automatic load balancing is initiated and all the EVCs of service group SG2 are redistributed to the M1 link. Even though the service group SG2 is now moved under the link M1, service group SG2 maintains its original QoS policy map, QoS2; when service groups are redistributed, the QoS policy maps are not affected.

Note You can manually load balance service groups and service instances across member links of a port channel using a feature called "User-Network Interface (UNI) Link Aggregation Group (LAG) Advanced load balancing". For more information, see the "Configuring Layer 2 Features" chapter in the Cisco 7600 Series Ethernet Services + Line Card Configuration Guide

How to Configure Service Groups

Creating a Service Group

In this procedure, you need to specify the name of a QoS policy to be attached to the service group. The QoS policy must already exist.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **service-group** *service-group-identifier*
4. **description** *descriptive-text*
5. **service-policy** {**input** | **output**} *policy-map-name*
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. - Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.

Command or Action	Purpose
Step 3 **service-group** *service-group-identifier* **Example:** Router(config)# service-group 20	Creates a service group and enters service-group configuration mode. • Enter the service group number. The number of service groups that can be created varies by router.
Step 4 **description** *descriptive-text* **Example:** Router(config-service-group)# description subscriber account number 105AB1	(Optional) Creates a description of the service group. • Enter a description (for example, additional information about the group) of the service group. Descriptions can be a maximum of 240 characters.
Step 5 **service-policy** {**input** | **output**} *policy-map-name* **Example:** Router(config-service-group)# service-policy input policy1	(Optional) Attaches a policy map to the service group, in either the ingress (input) or egress (output) direction. • Enter either the **input** or **output** keyword and the name of the previously created policy map.
Step 6 **end** **Example:** Router(config-service-group)# end	(Optional) Returns to privileged EXEC mode.

Adding or Deleting Service Instance Members

Note The following restrictions apply to service group members:

- In Cisco IOS Release 12.2(33)SRE on the Cisco 7600 series router, a member can join only one service group at a time.
- On the Cisco 7600 series router, all members of a service group must reside on the same physical or port channel interface.
- A member of a service group cannot be individually assigned to a load balance link of a port channel. The entire service group must be assigned to the load balance link.
- A service group cannot have members that are assigned to multiple load balance links on a port channel.
- The Cisco 7600 series router does not allow service instances to join the same group from multiple interfaces. On the Cisco 7600 series router, group members must come from the same interface, as shown in the the sample configuration below:

```
interface GigabitEthernet 2/0/0
service instance 1 ethernet
group 32
Service-policy output policy3
service instance 2 ethernet
group 32
service instance 3 ethernet
group 37
interface GigabitEthernet 2/0/1
service instance 1 ethernet
group 32   |<--Disallowed because this group has members in g2/0/0 already |

>
```

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number* **interface port-channel**
4. **service instance** *service-instance-number* **ethernet**
5. **group** *service-group-identifier*
6. **no group** *service-group-identifier*
7. **exit**
8. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** Router> enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** Router# configure terminal	Enters global configuration mode.
Step 3	**interface** *type number* **interface port-channel** **Example:** Router(config)# interface GigabitEthernet 1/0.56 **Example:** Router(config)# interface port-channel 50	Configures an interface and enters interface configuration mode. • Enter the interface type and the interface number. (Optional) Configures a port channel and enters interface configuration mode. • Enter the port channel number.
Step 4	**service instance** *service-instance-number* **ethernet** **Example:** Router(config-if)# service instance 200 ethernet	Specifies the service-instance to be added or deleted from a service group and enters service configuration mode. • Enter the service-instance number.
Step 5	**group** *service-group-identifier* **Example:** Router(config-if-srv)# group 20	Number of the service group to which the member specified in Adding or Deleting Service Instance Members, page 5 will be added. • Enter the service group number.
Step 6	**no group** *service-group-identifier* **Example:** Router(config-if-srv)# no group 30	(Optional) Number of the service group from which the member specified in Adding or Deleting Service Instance Members, page 5 will be deleted. • Enter the service group number.

	Command or Action	Purpose
Step 7	**exit** **Example:** Router(config-if-srv)# exit	(Optional) Returns to interface configuration mode.
Step 8	**end** **Example:** Router(config-if-srv)# end	(Optional) Returns to privileged EXEC mode.

Deleting a Service Group

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **no service-group** *service-group-identifier*
4. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** Router> enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** Router# configure terminal	Enters global configuration mode.
Step 3	**no service-group** *service-group-identifier* **Example:** Router(config)# no service-group 20	Deletes a service group and deletes all members from the service group. • Enter the service group number to be deleted. **Note** When you delete a service group, all members of the service group are automatically removed from the service group.

	Command or Action	Purpose
Step 4	**end**	(Optional) Exits global configuration mode.
	Example:	
	Router(config)# end	

Verifying the Service Instance Group Configuration

SUMMARY STEPS

1. **enable**
2. **show running-config service-group**
3. **show service-group** {*service-group-identifier* | **all**}
4. **show service-group interface** *type number*
5. **show service-group stats**
6. **show service-group state**
7. **show service-group traffic-stats**
8. **show policy-map interface** *type number* **service group** {*service-group-identifier*
9. **show policy-map target service-group** {*service-group-identifier*}
10. **show ethernet service instance** [**detail**]
11. **clear service-group traffic-stats**
12. **debug service-group** {**all** | **error** | **feature** | **group** | **interface** | **ipc** | **member** | **qos** | **stats**}

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable**	Enables privileged EXEC mode.
		• Enter your password if prompted.
	Example:	
	Router> enable	
Step 2	**show running-config service-group**	(Optional) Displays the running service-group configuration.
	Example:	
	Router# show running-config service-group	

	Command or Action	Purpose
Step 3	**show service-group** {*service-group-identifier* | **all**}	(Optional) Displays service-group configuration information for one or all service groups.
	Example:	
	Router# show service-group all	
Step 4	**show service-group interface** *type number*	(Optional) Displays service-group membership information by interface.
		• Enter the interface type and number.
	Example:	
	Router# show service-group interface gigabitethernet 3/1	
Step 5	**show service-group stats**	(Optional) Displays service-group statistical information.
	Example:	
	Router# show service-group stats	
Step 6	**show service-group state**	(Optional) Displays state information about service groups.
	Example:	
	Router# show service-group state	
Step 7	**show service-group traffic-stats**	(Optional) Displays traffic statistics for all the members of a service group.
		• The information displayed is the combined total of the traffic statistics for all members.
	Example:	
	Router# show service-group traffic-stats	
Step 8	**show policy-map interface** *type number* **service group** {*service-group-identifier*	(Optional) Displays policy-map information for service groups.
		• Enter the interface type and number.
	Example:	
	Router# show policy-map interface gigabitEthernet 9/5 service group	
Step 9	**show policy-map target service-group** {*service-group-identifier*}	(Optional) Displays policy-map information for service groups that have members attached to the specified interface.
		• Enter the service group identifier.
	Example:	
	Router# show policy-map target service-group 1	

Command or Action	Purpose
Step 10 **show ethernet service instance** [**detail**] **Example:** Router# show ethernet service instance detail	(Optional) Displays information about the service instances. **Note** To display the service group number, use the **detail** keyword.
Step 11 **clear service-group traffic-stats** **Example:** Router# clear service-group traffic-stats	(Optional) Clears the traffic statistics for the service group. **Note** Clearing the traffic statistics for the service group does not clear the traffic statistics for the group members. To clear the traffic statistics for group members, use the **clear ethernet service instance** command. For more information about the **clear ethernet service instance** command, see the Cisco IOS Carrier Ethernet Command Reference .
Step 12 **debug service-group** {**all** | **error** | **feature** | **group** | **interface** | **ipc** | **member** | **qos** | **stats**} **Example:** Router# debug service-group qos	(Optional) Debugs service-group events and errors.

Adding or Deleting a Subinterface from a Service Group

Note If a subinterface is already a member of a group, you cannot add it to another group. To move a subinterface, first delete it from the current group, then add it to the new group.

>

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **group** *service-group-identifier*
5. **no group** *service-group-identifier*
6. **exit**
7. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.

Command or Action		Purpose
Step 3	**interface** *type number*	Configures a subinterface and enters subinterface configuration mode.
		• Enter the interface type and the subinterface number.
	Example:	or
	interface range	Configures a range of subinterfaces and enters subinterface configuration mode.
	type number	
		• Enter the interface types and the subinterface numbers.
	Example:	or
	– *interface - number , . . .type number*	Configures a port channel.
		• Enter the port channel number.
	Example:	
	| **macro** *word*	
	Example:	
	interface port-channel	
	port-channel-number	
	Example:	
	Example:	
	Example:	
	`Router(config)# interface GigabitEthernet 1/0.30`	
	Example:	
	`Router(config)# interface range GigabitEthernet` `1/0.30 - GigabitEthernet 1/0.36`	
	Example:	
	`Router(config)# interface port-channel 5.48`	

Command or Action	Purpose
Step 4 **group** *service-group-identifier* **Example:** Router(config-subif)# group 20	Number of the service group to which the subinterfaces will be added. • Enter the service group number.
Step 5 **no group** *service-group-identifier* **Example:** Router(config-subif)# no group 30	(Optional) Number of the service group from which the subinterfaces will be deleted. • Enter the service group number.
Step 6 **exit** **Example:** Router(config-subif)# exit	(Optional) Returns to interface configuration mode.
Step 7 **end** **Example:** Router(config-subif)# end	(Optional) Returns to privileged EXEC mode.

Verifying the Subinterface Configuration

SUMMARY STEPS

1. **enable**
2. **show running-config service-group**
3. **show service-group** {*service-group-identifier* | **all**}
4. **show service-group interface** *type number*
5. **show policy-map target service-group** *service-group-identifier*
6. **show service-group stats**
7. **show service-group state**
8. **show service-group traffic-stats**
9. **clear service-group traffic-stats**
10. **debug service-group** {**all** | **error** | **feature** | **group** | **interface** | **ipc** | **member** | **qos** | **stats**}

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**show running-config service-group** **Example:** `Router# show running-config service-group`	(Optional) Displays the running service-group configuration.
Step 3	**show service-group** {*service-group-identifier* | **all**} **Example:** `Router# show service-group all`	(Optional) Displays service-group configuration information for one or all service groups.
Step 4	**show service-group interface** *type number* **Example:** `Router# show service-group interface gigabitethernet 3/1`	(Optional) Displays service-group membership information by interface. • Enter the interface type and number.
Step 5	**show policy-map target service-group** *service-group-identifier* **Example:** `Router# show policy-map target service-group 1`	(Optional) Displays the policy-map information for all service groups or the specified service group. • Enter the target and service group.
Step 6	**show service-group stats** **Example:** `Router# show service-group stats`	(Optional) Displays service-group statistical information.
Step 7	**show service-group state** **Example:** `Router# show service-group state`	(Optional) Displays state information about service groups.

Command or Action	Purpose
Step 8 **show service-group traffic-stats** **Example:** `Router# show service-group traffic-stats`	(Optional) Displays the traffic statistics for all the members of a service group. • The information displayed is the combined total of the traffic statistics for all members.
Step 9 **clear service-group traffic-stats** **Example:** `Router# clear service-group traffic-stats`	(Optional) Clears the traffic statistics for the service group. **Note** Clearing the traffic statistics for the service group does not clear the traffic statistics for the group members. To clear the traffic statistics for group members, use the **clear ethernet service instance** command. For more information about the **clear ethernet service instance** command, see the *Cisco IOS Carrier Ethernet Command Reference*.
Step 10 **debug service-group** {**all** | **error** | **feature** | **group** | **interface** | **ipc** | **member** | **qos** | **stats**} **Example:** `Router# debug service-group qos`	(Optional) Debugs service-group events and errors.

Configuration Examples for Service Groups

Example Creating a Service Group

In the following example, service group 20 has been created:

```
Router> enable

Router# configure terminal

Router(config)# service-group 20

Router(config-service-group)# description account number 105AB1

Router(config-service-group)# service-policy input policy1

Router(config-service-group)# end
```

Example Adding Service Instance Members to a Service Group

In the following example, service instance 200 will be added to service group 20:

```
Router> enable

Router# configure terminal

Router(config)# interface GigabitEthernet 1/0

Router(config-if)# service instance 200 ethernet

Router(config-if-srv)# group 20

Router(config-if-srv)# end
```

Example Adding Subinterfaces to a Service Group

In the following example, subinterface g3/7.12 will be added to service group 10:

```
Router> enable

Router# configure terminal

Router(config)# interface GigabitEthernet 3/7.12

Router(config-subif)# group 10

Router(config-subif)# end
```

Example Deleting Service Instance Members from a Service Group

In the following example, service instance 300 will be deleted from service group 30 on a port channel:

```
Router> enable

Router# configure terminal

Router(config)# interface port-channel 50

Router(config-if)# service instance 300 ethernet

Router(config-if-srv)# no group 30

Router(config-if-srv)# end
```

Example Deleting Subinterfaces from a Service Group

In the following example, subinterface g3/7.12 will be deleted from service group 10:

```
Router> enable

Router# configure terminal

router(config)# interface g3/7.12

router(config-subif)# no group 10

router(config-subif)# end
```

Example Deleting a Service Group

In the following example, service group 20 will be deleted:

```
Router> enable

Router# configure terminal

Router(config)# no service-group 20

Router(config)# end
```

Example Verifying the Service Group Configuration

This section contains sample output from the **show policy-map target service-group**command. The **show policy-map target service-group**command displays policy-map information for service groups.

Note This command is one of several that you can use to verify the service-group configuration. For additional commands that can be used, see the .

In the following example, service group 1 is specified. Service group 1 contains two policy maps (service policies), policy1 and policy2. Traffic policing is enabled in the evc policy map. Traffic queueing is enabled in the isg policy map.

```
Router# show policy-map target service-group 1

 GigabitEthernet9/5: Service Group 1

  Service-policy input: policy1

    Class-map: class-default (match-any)
      0 packets, 0 bytes
      5 minute offered rate 0000 bps, drop rate 0000 bps
      Match: any
      police:
          cir 200000 bps, bc 6250 bytes
        conformed 0 packets, 0 bytes; actions:
          transmit
        exceeded 0 packets, 0 bytes; actions:
          drop
        conformed 0000 bps, exceed 0000 bps

  Service-policy output: policy2

  Counters last updated 00:00:34 ago
    Class-map: class-default (match-any)
      0 packets, 0 bytes
      5 minute offered rate 0000 bps, drop rate 0000 bps
      Match: any
      Queueing
      queue limit 131072 packets
      (queue depth/total drops/no-buffer drops) 0/0/0
      (pkts output/bytes output) 0/0
      bandwidth remaining ratio 2
```

Additional References

Related Documents

Related Topic	Document Title
QoS commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples.	*Cisco IOS Quality of Service Solutions Command Reference*
Debug commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples.	*Cisco IOS Debug Command Reference*
MQC, policy maps	"Applying QoS Features Using the MQC" module

Related Topic	Document Title
Cisco IOS 7600 series routers	• *Cisco 7600-ES20 Ethernet Line Card Configuration Guide* • *Cisco 7600 Series Ethernet Services + Line Card Configuration Guide.*
Service instance configuration information and concepts	*Cisco IOS Carrier Ethernet Configuration Guide*
Service instance commands	*Cisco IOS Carrier Ethernet Command Reference*
Manually load balancing service groups and service instances across member links of a port channel	"Configuring Layer 2 Features" chapter of the Cisco 7600 Series Ethernet Services + Line Card Configuration Guide

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	--

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Service Groups

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1   *Feature Information for Service Groups*

Feature Name	Releases	Feature Information
Service Groups	12.2(33)SRE	The Service Groups feature allows network administrators to create service groups, add members (such as service instances) to those service groups, and apply service policies (also known as policy maps) to those newly created groups. In Release 12.2(33)SRE, this feature was introduced on the Cisco 7600 series router. The following commands were introduced or modified: **clear service-group traffic-stats**, **debug service-group**, **description**, **group, service-group**, **service instance ethernet, service-policy, show policy-map interface service group**, **show running-config service-group**, **show service-group**, **show service-group interface**, **show service-group state**, **show service-group stats**, **show service-group traffic-stats**.
Service Groups	15.1(1)S	In Cisco IOS Release 15.1(1)S, this feature was modified to support subinterfaces and access subinterfaces on Ethernet Service + line cards. A service group can have service instance members, subinterfaces, access subinterfaces, or a mix of the two under the same main interface on these linecards. The following command was introduced or modified: **show policy-map target service-group**.

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