SSG Direction Configuration for Interfaces and Ranges

The SSG Direction Configuration for Interfaces and Ranges feature introduces the **ssg direction** command. The **ssg direction** command replaces the **ssg bind direction** command. This new command streamlines and simplifies Service Selection Gateway (SSG) configuration by allowing you to configure interface direction, either uplink or downlink, for a range of subinterfaces at once.

Feature Specifications for the SSG Direction Configuration for Interfaces and Ranges Feature

Feature History	
Release	**Modification**
12.2(16)B	This feature was introduced.
12.3(4)T	This feature was integrated into Cisco IOS Release 12.3(4)T.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Prerequisites for SSG Direction Configuration for Interfaces and Ranges

SSG must be enabled on the router.

Restrictions for SSG Direction Configuration for Interfaces and Ranges

You cannot use this command on an individual subinterface that is part of a permanent virtual circuit (PVC) range because all members of a range must have the same direction. You can use the command on the entire range only.

An interface that does not exist will not be created as a result of the **ssg direction** command.

Before you can change a direction from uplink to downlink, or the opposite, you must use the **no ssg direction** command to clear the direction. If you do not, you will receive an error message similar to the following:

```
Changing direction from Downlink to Uplink is denied for interface interface
Please use 'no ssg direction downlink' to clear the previous bind direction
```

Information About SSG Direction Configuration for Interfaces and Ranges

Before you configure the **ssg direction** command, you should understand the following concepts:

Overview of SSG

SSG is a switching solution for service providers who offer intranet, extranet, and Internet connections to subscribers using broadband access technology such as xDSL, cable modems, or wireless to allow simultaneous access to network services. It is a combined hardware and software solution that helps service providers provide differentiated kinds of services to users connecting through different mediums. SSG also offers user authentication and accounting features.

Interface Direction

SSG implements Layer 3 service selection through selective routing of IP packets to destination networks on a per-subscriber basis. SSG introduces the idea of interface direction (uplink/downlink) and uses this direction to help determine the forwarding path of an incoming packet. An uplink interface is an interface to services; a downlink interface is an interface to subscribers. You can set the direction by using the **ssg direction** command.

The **ssg direction** command can be configured on most of the interfaces supported by the **interface** command, including

- Async
- Group Async
- ATM
- Extended Tag ATM (XTagATM)
- Bridge Group Virtual (BVI)
- CTunnel
- Tunnel
- Dialer
- IEEE 802.3 Ethernet
- IEEE 802.3 Fast Ethernet
- IEEE 802.3z Gigabit Ethernet
- Loopback
- Multilink Frame Relay (MFR) bundle
- Multilink group
- Pragmatic General Multicast (PGM) Host (Vif)
- Virtual Access
- Virtual Template
- Virtual Token Ring

You can use the **ssg direction** command to configure the direction of a single interface or subinterface or a range of subinterfaces (ATM PVCs). If you configure a range, all members of the range must have the same direction, and you cannot configure members of a range individually.

Benefits of SSG Direction Configuration for Interfaces and Ranges

The new **ssg direction** command makes SSG configuration simpler and faster. For example, you can provision a large number of ATM routed bridge encapsulation (RBE) subscribers at once, instead of having to enter one command for each subscriber, which could mean entering thousands of commands. This feature enables streamlined provisioning and configuration, with decreased CPU load.

How to Configure SSG Direction for Interfaces and Ranges

This section contains the following procedures:

- Setting the Direction for an Interface, page 4
- Setting the Direction for a PVC Range, page 5

Setting the Direction for an Interface

Perform this task to configure an interface or subinterface as uplink or downlink. An uplink interface is an interface to services; a downlink interface is an interface to subscribers.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ssg enable**
4. **interface** *type number*
5. **ssg direction** {**downlink** | **uplink**}

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	**ssg enable** **Example:** `Router(config)# ssg enable`	Enables privileged EXEC mode.
Step 4	**interface** *type number* **Example:** `Router(config)# interface FastEthernet 1/0`	Specifies an interface and enters interface configuration mode.
Step 5	**ssg direction** {**downlink** | **uplink**} **Example:** `Router(config-if)# ssg direction downlink`	Sets the direction of the interface. • An uplink interface is an interface to services; a downlink interface is an interface to subscribers.

Troubleshooting Tips

Use the **show ssg interface** command in privileged EXEC mode to find out the direction of the interface.

Setting the Direction for a PVC Range

Perform this task to configure a range of subinterfaces as uplink or downlink. An uplink interface is an interface to services; a downlink interface is an interface to subscribers.

Restrictions

All subinterfaces in a range must have the same direction.

If you try to specify the direction of an interface that is part of a PVC range, you receive an error similar to the following:

```
PVC Range: Configuring interface is not allowed.
```

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ssg enable**
4. **interface atm** *interface-number.subinterface-number* {**mpls** | **multipoint** | **point-to-point**}
5. **range** [*range-name*] **pvc s***tart-vpi/start-vci end-vpi/end-vci*
6. **exit**
7. **ssg direction** {**downlink** | **uplink**}

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	**ssg enable** **Example:** `Router(config)# ssg enable`	Enables privileged EXEC mode.
Step 4	**interface atm** *interface-number.subinterface-number* {**mpls** | **multipoint** | **point-to-point**} **Example:** `Router(config)# interface ATM 1/0.1 point-to-point`	Specifies a subinterface and enters subinterface configuration mode.

	Command or Action	Purpose
Step 5	**range** [*range-name*] **pvc** *start-vpi*/*start-vci* *end-vpi*/*end-vci* **Example:** `Router(config-subif)# range MyRange pvc 1/32 1/42`	Defines a PVC range. • Use this command if a range was not already defined. You can also use this command after the **ssg direction** command, with the same effect.
Step 6	**exit** **Example:** `Router(config-if-atm-range)# exit`	Returns to subinterface configuration mode.
Step 7	**ssg direction** {**downlink** | **uplink**} **Example:** `Router(config-subif)# ssg direction downlink`	Sets the direction of the subinterfaces. • An uplink interface is an interface to services; a downlink interface is an interface to subscribers.

Troubleshooting Tips

Use the **show ssg interface** command in privileged EXEC mode to find out the direction of the interface.

Configuration Examples for SSG Direction Configuration for Interfaces and Ranges

Setting the Direction of an Interface: Example

The following example shows how to configure Fast Ethernet interface 1/0 as a downlink interface:

```
ssg enable
interface FastEthernet 1/0
 ssg direction downlink
```

Setting the Direction of a Range of PVCs: Example

The following example show how to create a range called “MyRange” and set the direction of all subinterfaces in the range to downlink:

```
ssg enable
interface ATM 1/0.1 point-to-point
 range MyRange pvc 1/32 1/42
  exit
 ssg direction downlink
```

Additional References

Consult the following references for information related to the SSG Direction Configuration for Interfaces and Ranges feature.

Related Documents

Related Topic	Document Title
Cisco IOS commands	*Cisco IOS Master Commands List*, Release 12.3(102)T
SSG configuration tasks and commands	*Service Selection Gateway,* 12.2(8)T new-feature document *Service Selection Gateway Accounting Update Interval per Service*, 12.2(13)T new-feature document *SSG AutoDomain*, 12.2(13)T new-feature document *Service Selection Gateway Hierarchical Policing*, 12.2(13)T new-feature document *SSG TCP Redirect for Services*, 12.2(13)T new-feature document *SSG Autologon Using Proxy Radius*, 12.2(13)T new-feature document *SSG Autologoff*, 12.2(13)T new-feature document *SSG Port-Bundle Host Key*, 12.2(13)T new-feature document *SSG Open Garden*, 12.2(13)T new-feature document *SSG Prepaid*, 12.2(13)T new-feature document

Standards

Standards	Title
No new or modified standards are supported by this feature. Support for existing standards has not been modified by this feature.	—

MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature. 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

RFCs	Title
No new or modified RFCs are supported by this feature. Support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/public/support/tac/home.shtml

Command Reference

This section documents the following new, modified, obsolete, and replaced commands. All other commands used with this feature are documented in the Cisco IOS Release 12.3 T command reference publications.

- **ssg bind direction**
- **ssg direction**

Obsolete and Replaced Commands

Table 1 lists those commands that have been replaced since Cisco IOS Release 12.2(16)B and Cisco IOS Release 12.3(4)T.

Table 1 Replaced SSG Commands

Command in Cisco IOS Release 12.2(15)T	Replacement Command Since Cisco IOS Releases 12.2(16)B and 12.3(4)T
ssg bind direction {**downlink** | **uplink**} *interface*	**ssg direction** {**downlink** | **uplink**}

ssg bind direction

Note Effective with Cisco IOS Release 12.2(16)B, this command was replaced by the **ssg direction** command. The **ssg bind direction** command is still supported for backward compatibility, but support for this command will be removed in a future Cisco IOS release.

To specify an interface as a downlink or uplink interface, use the **ssg bind direction** command in global configuration mode. To disable the directional specification for the interface, use the **no** form of this command.

ssg bind direction {**downlink** | **uplink**} {**ATM** *atm-interface* | **Async** *async-interface* | **BVI** *bvi-interface* | **Dialer** *dialer-interface* | **Ethernet** *ethernet-interface* | **FastEthernet** *fastethernet-interface* | **Group-Async** *group-async-interface* | **Lex** *lex-interface* | **Loopback** *loopback-interface* | **Multilink** *multilink-interface* | **Null** *null-interface* | **Port-channel** *port-channel-interface* | **Tunnel** *tunnel-interface* | **Virtual-Access** *virtual-access-interface* | **Virtual-Template** *virtual-template-interface* | **Virtual-TokenRing** *virtual-tokenring-interface*}

no ssg bind direction {**downlink** | **uplink**} {**ATM** *atm-interface* | **Async** *async-interface* | **BVI** *bvi-interface* | **Dialer** *dialer-interface* | **Ethernet** *ethernet-interface* | **FastEthernet** *fastethernet-interface* | **Group-Async** *group-async-interface* | **Lex** *lex-interface* | **Loopback** *loopback-interface* | **Multilink** *multilink-interface* | **Null** *null-interface* | **Port-channel** *port-channel-interface* | **Tunnel** *tunnel-interface* | **Virtual-Access** *virtual-access-interface* | **Virtual-Template** *virtual-template-interface* | **Virtual-TokenRing** *virtual-tokenring-interface*}

Syntax Description

downlink	Specifies interface direction as downlink.
uplink	Specifies interface direction as uplink.
ATM	Indicates that the interface is ATM.
atm-interface	ATM interface.
Async	Indicates that the interface is asynchronous.
async-interface	Async interface.
BVI	Indicates that the interface is BVI.
bvi-interface	Bridge-Group Virtual Interface.
Dialer	Indicates that the interface is dialer.
dialer-interface	Dialer interface.
Ethernet	Indicates that the interface is IEEE 802.3 Ethernet.
ethernet-interface	Ethernet interface.
FastEthernet	Indicates that the interface is IEEE 802.3 Fast Ethernet.
fastethernet-interface	Fast Ethernet interface.
Group-Async	Indicates that the interface is group async.
group-async-interface	Group async interface.
Lex	Indicates that the interface is lex.
lex-interface	Lex interface.

Loopback	Indicates that the interface is loopback.
loopback-interface	Loopback interface.
Multilink	Indicates that the interface is multilink.
multilink-interface	Multilink interface.
Null	Indicates that the interface is null.
null-interface	Null interface.
Port-channel	Indicates that the interface is port channel.
port-channel-interface	Port channel interface.
Tunnel	Indicates that the interface is tunnel.
tunnel-interface	Tunnel interface.
Virtual-Access	Indicates that the interface is virtual access.
virtual-access-interface	Virtual access interface.
Virtual-Template	Indicates that the interface is virtual template.
virtual-template-interface	Virtual template interface.
Virtual-TokenRing	Indicates that the interface is virtual token ring.
virtual-tokenring-interface	Virtual token ring interface.

Defaults

All interfaces are configured as uplink interfaces by default.

Command Modes

Global configuration

Command History

Release	Modification
12.0(3)DC	This command was introduced on the Cisco 6400 node route processor.
12.2(4)B	This command was integrated into Cisco IOS Release 12.2(4)B.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T.
12.2(16)B	This command was replaced by the **ssg direction** command.
12.3(4)T	This command was replaced by the **ssg direction** command.

Usage Guidelines

Use this command to specify an interface as downlink or uplink. An uplink interface is an interface to services; a downlink interface is an interface to subscribers.

Examples

The following example shows how to specify an ATM interface as a downlink interface:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# ssg bind direction downlink ATM 0/0/0.10
```

Related Commands

Command	Description
show ssg binding	Displays service names that have been bound to interfaces and the interfaces to which they have been bound.

ssg direction

To configure an interface or range of subinterfaces as downlink or uplink, use the **ssg direction** command in interface configuration mode or subinterface configuration mode. To clear the directional specification, use the **no** form of this command.

ssg direction {**downlink** | **uplink**}

no ssg direction

Syntax Description

downlink	Specifies the interface direction as downlink. A downlink interface is an interface to subscribers.
uplink	Specifies the interface direction as uplink. An uplink interface is an interface to services.

Defaults

An interface is neither uplink nor downlink.

Command Modes

Interface configuration
Subinterface configuration

Command History

Release	Modification
12.2(16)B	This command was introduced.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T.

Usage Guidelines

Service Selection Gateway (SSG) includes the concept of an interface direction, either uplink or downlink. It uses this direction when determining the forwarding path of an incoming packet. The **ssg direction** command allows you to specify a direction for an interface or a range of subinterfaces.

The command operates on a variety of interfaces, including async, group async, ATM, extended tag ATM (XTagATM), bridge group virtual (BVI), CTunnel, tunnel, dialer, IEEE 802.3 Ethernet, IEEE 802.3 Fast Ethernet, IEEE 802.3z GigabitEthernet, loopback, multilink Frame Relay (MFR) bundle, multilink group, Pragmatic General Multicast (PGM) Host (Vif), virtual access, virtual template, and virtual Token Ring.

The **ssg direction** command allows you to configure the direction for a range of PVCs. All members of a range must have the same direction.

If you try to configure the direction of a subinterface that is part of a PVC range, you receive an error similar to the following:

```
PVC Range: Configuring interface is not allowed.
```

Before you can change a direction from uplink to downlink, or the opposite, you must use the **no ssg direction** command to clear the direction.

The **ssg direction** command replaces the **ssg bind direction** command. If you reboot a router that uses an old configuration, the **ssg bind direction** commands will be converted to **ssg direction** commands until the **ssg bind direction** command is made obsolete. In a later release, the **ssg bind direction** command will no longer be supported.

Note An interface that does not exist will not be created as a result of the **ssg direction** command.

Examples

The following example sets the direction of a Fast Ethernet interface to downlink while in interface configuration mode:

```
ssg enable
interface FastEthernet 1/0
 ssg direction downlink
```

The next example creates a range called “MyRange” and sets the direction of all subinterfaces in the range to downlink while in subinterface configuration mode:

```
ssg enable
interface ATM 1/0.1 point-to-point
 range MyRange pvc 1/32 1/42
 ssg direction downlink
```

Related Commands

Command	Description
range pvc	Defines a range of ATM PVCs.
show ssg direction	Displays the direction of all interfaces for which a direction has been specified.
show ssg interface	Displays SSG information about one or more interfaces.