Instant Access (IA)

Note
- For complete syntax and usage information for the commands used in this chapter, see these publications:

  http://www.cisco.com/en/US/products/ps11846/prod_command_reference_list.html

- Cisco IOS Release 15.1SY supports only Ethernet interfaces. Cisco IOS Release 15.1SY does not support any WAN features or commands.

Prerequisites for Instant Access

- An IA parent—A VSS-mode Catalyst 6800 switch or a VSS-mode Catalyst 6500 switch equipped with a Supervisor Engine 2T and one or more WS-X6904-40G-2T switching modules, configured to support 10GE links.
- IA clients—Catalyst 6800ia access switches

  See this publication for more information:

  http://www.cisco.com/en/US/prod/collateral/switches/ps10902/ps715/ps13198/data_sheet_c78-728230.html

- See this publication for more information about Instant Access:

  http://www.cisco.com/en/US/prod/collateral/switches/ps10902/ps715/ps13198/white_paper_c11-728265.html

- For image download during ISSU upgrade, remove **ip tftp source-interface** config on IA Parent, and add a static route to copy image through **mgmt** intf.

Restrictions for Instant Access

- The IA parent must operate in VSS mode.

    > **Note**   • You can enable VSS mode on a single chassis to support IA clients.
    > • The VSS Quad-Sup SSO (VS4O) feature is supported with IA clients from Release 15.1(2)SY2.

- The IA parent-client connection is supported on links between WS-X6904-40G-2T switching module 10GE ports and Catalyst 6800ia access switch 10GE ports.

    - You can use up to 6 IA client 10GE ports in the IA parent-client link. See this document for information about WS-X6904-40G-2T switching module port configuration:

        http://www.cisco.com/en/US/prod/collateral/switches/ps5718/ps708/white_paper_c11-696669.html

    - IA client 10-Gigabit Ethernet ports require no configuration.

    - UDLD, LLDP, and CDP are not supported on the A parent-client link.

    - Instant Access does not use STP on the IA parent-client connection.

    - Use only XL based modules for scale FEX QoS configuration to prevent issues with TCAM (ternary content-addressable memory) utilization. When QoS policy is configured on 1500 FEX host ports, the first 511 interfaces share the TCAM utilization. But, remaining ports will start using new TCAM entries for each interface and will exhaust non-XL TCAM utilization.

- IA client maximum values:

- IA client ports do not support these features:

Value Description:	Maximum Value
Maximum IA client ports	1008 ports across 21 Catalyst 6800ia access switches
Maximum IA client stacks	12 (defined by IA client FEX number 1–12 range.)
Maximum Catalyst 6800ia access switches per IA client stack	3 • An IA client stack acts as single switch unit. • Instant access only supports connection with stacking cables to form a stack. • With an IA client that has multiple Catalyst 6800ia access switches, the switches in the stack assign incrementing switch numbers to themselves (automatic stacking capability). • If you add Catalyst 6800ia access switches to a configured IA client, the additional switches assign incrementing switch numbers to themselves. • The IA client configuration does not persist if the access switch number changes.

Value Description:	Maximum Value
Maximum number of VLANs per IA client stack	You can set upto 1,000 VLANs, we recommend to set not more than 20 VLANs per FEX.
Maximum Number of Port Channels	512

- Configuring EtherChannels with combination of FEX Ports from different FEX-IDs or combination of FEX ports with IA parent switch linecard ports is not supported. However, FEX host port channel from the same FEX is supported.

- FEX host port EtherChannel load balancing is not supported.

- Port debounce timer

- UDLR tunnel ARP and IGMP proxy

- Uni-Directional Link Routing (UDLR)

- IEEE 802.1Q tunneling

- VLAN Mapping

- VLAN Translation

- IEEE 802.1Q custom ethertypes

- L2PT - Layer 2 protocol tunneling

- L2PT - Layer 2 protocol tunneling on trunk ports

- 802.1ad tunnelling

- Port security on 802.1Q tunnel ports

- Private VLANs (PVLAN)

- VACL capture

- Per-VLAN load balancing for Advanced QinQ service mapping

- Cisco TrustSec NDAC (Network Device Admission Control)

- Cisco TrustSec security association protocol (SAP) for MACSec encryption

- Cisco TrustSec confidentiality and integrity with MACsec (IEEE 802.1AE)

- Cisco TrustSec identity port mapping

- Network edge authentication topology (NEAT)

- AutoQoS

- MQC queuing policy support

- Priority queueing (PQ)

- QoS aggregated DSCP values for WRED

- QoS aggregated precedence values for WRED

- Class based weighted fair queuing (CBWFQ)

- Class-based shaping

- DiffServ-compliant dWRED

- Diffserv-compliant WRED

- Selective packet discard (SPD)

- Strict priority low latency queueing (LLQ)
- Weighted fair queueing (WFQ)
- Weighted RED (WRED)
- QoS policer rate increase to 256G
- Ethernet over MPLS (EoMPLS) - IEEE 802.1q Tag Stacking
- H-VPLS N-PE redundancy for QinQ access
- Connectivity fault management (CFM)
- Ethernet connectivity fault management (E-CFM)
- Ethernet local management interface (LMI) at provider edge (PE)
- Ethernet operations, administration, and Maintenance (OAM)
- Ethernet-OAM 3.0: CFM over BD, Untagged
- IEEE 802.1ag - D8.1 standard Compliant CFM, Y.1731 multicast LBM / AIS / RDI / LCK, IP SLA for Ethernet
- IEEE 802.1ag Compliant CFM (D8.1)

- To use an IA client port as a SPAN destination, add the IA client port VLAN to the SPAN allowed VLAN list with the **switchport trunk allowed vlan** command.

- When FEX IA parent-client link portchannel is configured as SPAN source in Tx direction or both directions, the SPAN destination should not be on the same FEX. This is applicable for both stacked and standalone FEX.

- To enable formation of ISIS adjacencies on IA client ports, configure an explicit connectionless network service (CLNS) MTU size on the IA client and peer ports. The maximum MTU value that can be configured for CLNS is 9216. The CLNS MTU size should be the same on both sides of the ISIS link.

  This example shows how to configure the default MTU size on an IA client port:

```
Router# configure terminal
Router(config)# interface interface Gig118/1/0/1
Router(config-if)# ip router isis
Router(config-if)# clns mtu 1497
```

- IA client port QoS:
  - Configure ingress QoS on the IA parent port-channel interface.
  - The egress QoS configuration on IA client ports is not configurable.
  - Port architecture (Rx/Tx): 1p3q3t

1p3q3t strict-priority egress queue (queue 1)		CoS	Not supported
		DSCP	32, 33, 40–47
		Tail-drop	100% (nonconfigurable)
		WRED-drop	Not supported
1p3q3t standard egress queue 2 (high priority)	Threshold 1	CoS	Not supported
		DSCP	16–23, 26–31, 34–39
		Tail-drop	Disabled; 100%
		WRED-drop	Not supported
	Thresholds 2	CoS	Not supported
		DSCP	24
		Tail-drop	Disabled; 100%
		WRED-drop	Not supported
	Thresholds 3	CoS	Not supported
		DSCP	48-63
		Tail-drop	Disabled; 100%
		WRED-drop	Not supported
1p3q3t standard egress queue 3 (medium priority)	Threshold 1	CoS	Not supported
		DSCP	25
		Tail-drop	Disabled; 70%
		WRED-drop	Not supported
	Threshold 2	CoS	Not supported
		DSCP	None.
		Tail-drop	Disabled; 100%
		WRED-drop	Not supported
	Thresholds 3	CoS	Not supported
		DSCP	0–7
		Tail-drop	Disabled; 100%
		WRED-drop	Not supported

1p3q3t standard egress queue 4 (lowest priority)	Threshold 1	CoS	Not supported
		DSCP	8, 9, 11, 13, 15
		Tail-drop	Disabled; 70%
		WRED-drop	Not supported
	Threshold 2	CoS	Not supported
		DSCP	10, 12, 14
		Tail-drop	Disabled; 100%
		WRED-drop	Not supported
	Threshold 3	CoS	Not supported
		DSCP	None.
		Tail-drop	Disabled; 100%
		WRED-drop	Not supported

Information About Instant Access

The Instant Access (IA) feature supports multiple Catalyst 6800ia access switches that function as clients of the IA parent switch. The IA parent and client switches form a single extended switch with a single management domain, managed by the IA parent.

The IA parent uses the Satellite Discovery Protocol (SDP) and the Satellite Registration Protocol (SRP) to automatically discover IA clients when they connect and monitor the IA client-parent link. The IA parent upgrades the IA client software image if it is not the same as the parent.

The IA parent features are applied to IA client traffic. The IA clients do not perform any local packet forwarding. All traffic originating from IA client ports are sent to the IA parent, which makes all the switching and forwarding decisions.

These online diagnostic tests support Instant Access clients:

- TestFexModeLoopback, page 1-4
- TestFexFabricLinkStatus, page 1-39

Default Settings for Instant Access

By default, these configurations are present on each interface:

```
switchport
switchport trunk allowed vlan 1
switchport mode dynamic auto
```

How to Configure Instant Access

Configure Instant Access Staggered Initialization Mode

Instant Access staggered initialization mode avoids any excessively high CPU utilization that might occur if multiple IA clients attempt to initialize simultaneously. To configure Instant Access staggered initialization mode, perform this task:

Command	Purpose
Router(config)# **fex stagger** *delay_value*	Configures Instant Access staggered initialization mode. The *delay_value* can be 0 through 500. **Note** The recommended *delay_value* is 120.

This example shows how to configure Instant Access staggered mode:

```
Router# configure terminal
Router(config)# fex stagger 120
```

Enable IA Client Preprovisioning

To allow IA client port configuration before the IA client is connected, perform this task:

Command	Purpose
Router# **module provision create fex** *fex_number* **type** {**C6800IA-48FPD** | **C6800IA-48TD** | **C6800IA-48FPDR**} [**slot** *switch_number*]	Enables IA client port configuration before the IA client is connected. Enter the **slot** *switch_number* keyword and argument to enable configuration of a specific IA client stack member or an additional stack member before it is added to the IA client stack.

Configure Instant Access Port-Channel Interfaces

To create a port channel interface to support IA clients, perform this task:

	Command	Purpose
Step 1	Router(config)# **interface port-channel** *group_number*	Creates the port channel interface. There can be up to a maximum of 512 port-channel interfaces (12 port-channel interfaces can be used to support IA clients). ✎ **Note** If desired, you can configure the *group_number* to match the IA client FEX number.
Step 2	Router(config-if)# **switchport**	Configures the port channel interface for Layer 2 switching.
Step 3	Router(config-if)# **switchport mode fex-fabric**	Configures the port channel interface to support IA clients.
Step 4	Router(config-if)# **fex associate** *fex_number*	Configures the IA client FEX number. • The valid value range is 101–199. • Maximum of 12 IA client FEX numbers.

This example shows how to create port channel interface 1 and configure it to support IA FEX number 118:

```
Router# configure terminal
Router(config)# interface port-channel 118
Router(config-if)# switchport
Router(config-if)# switchport mode fex-fabric
Router(config-if)# fex associate 118
```

Configure Instant Access Channel Groups

To configure channel groups to support IA clients, perform this task for the 10 Gigabit Ethernet LAN ports that connect to IA clients:

	Command	Purpose
Step 1	Router(config)# **interface range** *first_10ge_port, last_10ge_port*	Selects the ports to configure.
Step 2	Router(config-if)# **switchport**	Configures the port channel interface for Layer 2 switching.
Step 3	Router(config-if)# **switchport mode fex-fabric**	Configures the port channel interface to support IA clients.
Step 4	Router(config-if)# **channel-group** *group_number* **mode on**	Configures the LAN port in an IA Client port channel and configures the mode as **on**.

✎
Note More links can be added to the channel group at any time.

This example shows how to configure 10 Gigabit Ethernet ports 1/2/5 and 2/2/5 into port channel 118 with mode **on**:

```
Router# configure terminal
Router(config)# interface range tengigabitethernet 1/2/5, 2/2/5
Router(config-if)# switchport
Router(config-if)# switchport mode fex-fabric
Router(config-if)# channel-group 118 mode on
Router(config-if)# end
```

This example shows how to verify the IA configuration when the IA client is connected:

```
Router# show fex 118 detail
FEX: 118 Description: FEX0118 state: online
FEX version: version_string
Extender Model: C6800IA-48TD, Extender Serial: serial_number
FCP ready: yes
Image Version Check: enforced
Fabric Portchannel Ports: 2
Fabric port for control traffic: Te1/2/5
Fabric interface state:
Po20 - Interface Up.
Te1/2/5 - Interface Up. state: bound
Te2/2/5 - Interface Up. state: bound
```

Identify Connected IA Client Stack Modules

- Identify IA Client Stack Modules by Serial Number, page 2-9
- Identify IA Client Modules by Beacon LED, page 2-9

Identify IA Client Stack Modules by Serial Number

This example shows how to identify IA client stack modules by serial number:

```
Router# show interface fex
     Fabric      Fabric Port  FEX                    FEX
FEX  Port        State        Uplink    Model            Serial
----------------------------------------------------------------------
101  Te1/2/5     bound        Te1/0/1   C6800IA-48FPD    FHH1707P00S
101  Te1/2/13    bound        Te2/0/1   C6800IA-48FPD    FHH1707P00S
101  Te2/2/5     bound        Te1/0/2   C6800IA-48FPD    FHH1707P00S
101  Te2/2/13    bound        Te2/0/2   C6800IA-48FPD    FHH1707P00S
102  Te1/2/6     bound        Te1/0/2   C6800IA-48TD     FOC1709Z2V9
102  Te2/2/17    bound        Te2/0/2   C6800IA-48TD     FOC1709Z2V9
```

Identify IA Client Modules by Beacon LED

```
Router(config)# hw-module fex <> slot <> led beacon
```

This example shows how to activate the beacon LED on IA client 118, slot 1:

```
Router(config)# hw-module fex 118 slot 1 led beacon
```

This example shows how to verify the beacon LED on IA client 118, slot 1:

```
Router(config)# show hw-module fex led beacon
C6K FEX BLUE BEACON CONFIG
---------------------------------
hw-module fex 118 slot 1 led beacon
```

Renumbering FEX Switch-ID

The renumbering of IA clients can be managed using switch-id allocation from controller, after stack boot up. Also, a priority can be assigned to the FEX members to take over as the master switch.

The following conditions must exist for successful execution of FEX switch-id allocation:

– For renumbering, the source slot should be online and the target slot should be offline.

– If the source slot FEX type is different than target slot FEX type, the interface configurations will be lost if you proceed with renumbering.

– Same target slot cannot be used for renumbering multiple source slots.

– Same source slot cannot be renumbered to multiple target slot.

– You can enter multiple renumbering entries along with different swapping scenarios.

– When priority is modified for a member IA, the whole stack will reload.

– During In Service Software Upgrade (ISSU) process, switch-id renumbering or priority changes are not allowed.

To renumber FEX switch-id and assign priority, perform this task:

	Command	Purpose
Step 1	Switch# **module provision update fex** *fex_id*	Enters into switch renumber sub-mode.
Step 2	Switch(exec-fex-update)# **renumber** *source_slot* **to** *target_slot*	Renumbers *source_slot* to *target_slot*
Step 3	Switch(exec-fex-update)# **priority** *source_slot* **value** *number*	Assigns the mentioned priority *number* to the *source_slot.*
Step 4	Switch(exec-fex-update)# **commit**	Commits all entries entered under *exec-fex-update* sub-mode.

Note   After the commit operation, you will be prompted whether you want to release the old source-vslot or not. This confirmation will not be asked only in a switch-id swap scenario (for example, renumber 1 to 2 and renumber 2 to 1) because both renumbering are done in a single commit operation.

To renumber FEX switch-id when scale is set to maximum FEX slots, perform this task:

	Command	Purpose
Step 1	Switch# **module provision update fex** *fex_id* **temp-vslot-allow enable**	When maximum vslots are already allocated, temp-vslot-allow will enable the temporary vslot module to come online.
Step 2	Switch# **module provision update fex** *fex_id*	Enters into switch renumber sub-mode.
Step 3	Switch(exec-fex-update)# **renumber** *source_slot* **to** *target_slot*	Renumbers *source_slot* to *target_slot*
Step 4	Switch(exec-fex-update)# **priority** *source_slot* **value** *number*	Assigns the mentioned priority *number* to the *source_slot.*

	Command	Purpose
Step 5	Switch(exec-fex-update)# **commit**	Commits all entries entered under *exec-fex-update* sub-mode.
Step 6	Switch# **module provision update fex** *fex_id* **temp-vslot-allow disable**	Disables the temporary vslot module to go offline.

Note After the commit operation, you will be prompted whether you want to release the old source-vslot or not. This confirmation will not be asked only in a switch-id swap scenario (for example, renumber 1 to 2 and renumber 2 to 1) because both renumbering are done in a single commit operation.

Example: Renumbering FEX switch-id and setting priority

```
Switch# module provision update fex 101

Switch(exec-fex-update) renumber 3 to 4

Switch(exec-fex-update) priority 2 value 1

%FEX 101 will reload upon commit.

Are you sure you want to proceed? [no]: yes

Switch(exec-fex-update)#commit

%Do you want to release FEX 101 module 3 source interface configs(vslot) after module
offline? [no]: yes

%FEX 101 All modules will reload.

Are you sure you want to proceed? [no]: yes
```

Example: Identifying if temporary vslot is online

This example shows how to identify when a particular temporary FEX vslot is online:

```
Switch# show fex system platform usage
FEX id usage details
   Fex-ids inuse: 150
   Fex-ids online: 150
   Total      Used     Free
   -----      ----     ----
   42         1        41
FEX slot usage details
   FEX-id     Switch-id    Vslot    Pslot    Status
   ------     ---------    -----    -----    ------
     150         3           51       2      In-use
     150         3           52       3      In-use
     150         3           53       5      Reserved
     150         3           55       4      In-use
     150         3           92       1      Temp-In-use
  Total     Used     Reserved    Temp-Use/Free   Free
  -----     ----     --------    -------------   ----
   47        3          1           1/4          42
Current Temp vslot allowed FEXs: 150
Current Temp VSLOT usage:
-----------------------
 FEX 150 module 1

FEX ports usage details
   FEX-id     Switch-id    Ports
   ------     ---------    -----
     150         3          192
   Total     Used    Free
```

```
              -----     ----     ----
              2016      192      1824

    Stack members usage details
       FEX-id    Switch-id    Used    Free
```

Example: Identifying FEX IDs where temp-vslot-allow command is enabled

This example verifies the active entries under sub-mode and also the FEX IDs on which "temp-vslot-allow" is enabled.

```
Switch(exec-fex-update)#show
Current module renumber mappings for FEX 101
--------------------------------------------
  renumber 1 to 2
Current module Priority mappings for FEX 101
--------------------------------------------
  priority 1 value 15
Temp vslots allowed:YES
Current Temp vslot allowed FEXs:101
Switch(exec-fex-update)#
```

Configure IA Clients

The configuration for IA clients can be entered on the IA parent before or after the IA clients are connected. IA client 10-Gigabit Ethernet ports require no configuration. IA client Gigabit Ethernet ports use this format:

gigabitethernet/*fex_number*/*access_switch_number*/0/*port_number*

- *fex_number*—The IA client FEX number:

    —Maximum of 12 IA FEX numbers.

    —The valid value range is 101–199.

- *access_switch_number*—The access switch number:

    —The valid values are 1, 2, or 3.

    —Multiple-switch stacks assign incrementing switch numbers to themselves.

    —See the "Identify Connected IA Client Stack Modules" section on page 2-9.

- The third interface parameter is always zero.

- The *port_number* valid value range is 1–48.

Note
- IA client configuration does not persist if the access switch number changes.

- The interface-range configuration mode supports IA clients ports (see "How to Configure a Range of Interfaces" section on page 10-2)

Display or Clear SDP and SRP Traffic

To display the counters that record the SDP packet traffic on IA client 118, enter the following command:

```
Router# show fex 118 protocol | incl SDP
    130 SDP pkts sent
    129 SDP pkts received
    130 SDP pkts sent
    129 SDP pkts received
```

> **Note** The command displays a sent and received value for each link in the IA channel group.

To clear the protocol counters, enter the **clear fex** *fex_number* {**sdp** | **srp**} command.

Configure Optional Parameters for an IA Client

- Enter the IA Client Configuration Mode, page 2-13
- Configure a Description, page 2-13
- Configure the Custom Location Type Feature, page 2-13
- Configure MTU, page 2-14

Enter the IA Client Configuration Mode

To enter the IA client configuration mode, perform this task:

Command	Purpose
Router(config)# **fex** *fex_number* Router(config-fex)#	Enters IA client configuration mode. **Note** Sets the IA client description to **FEX0***fex_number*.

Configure a Description

To configure a description for the IA client or for each module in the IA client stack, perform this task:

Command	Purpose
Router(config-fex)# [**module** *module_number*] description *description_string*	Configures a description for the IA FEX number or for a module in the IA client stack.

Configure the Custom Location Type Feature

You can configure the custom location type feature for the IA client in IA client configuration mode. See these publications for information about the **location** command:

http://www.cisco.com/en/US/docs/ios-xml/ios/cether/command/ce-cr-book.html

http://www.cisco.com/en/US/docs/ios-xml/ios/cether/command/ce-e1.html

> **Note** The **location** commands support the optional **fex-location** keyword for IA clients.

Configure MTU

You can configure MTU on the IA FEX using the **mtu** command in fex config mode. In an IA client stack, the configured MTU value is applied to all the host members in the stack.

To configure MTU for an IA client, perform this task:

Command	Purpose
Router# **configure terminal**	Enters the global configuration mode.
Router(config)# **fex 110**	Enters IA client configuration mode.
Router(config-fex)# **mtu 2000**	Resets the MTU value for the FEX system. All the FEX ports will be set to use the new MTU value.
	The default MTU value for a FEX host port is 9216.
	Note For Cisco Catalyst C6840 series switch, the maximum supported MTU for native interface is 9154. The default MTU value is 1500. If the MTU of peer (Catalyst 6880 or Sup2T) is configured higher than 9154, the packet will not be processed. When using existing configuration from a Catalyst 6880 or Sup2T, ensure that the MTU is reset or removed.
Router# **end**	Exits the global configuration mode.
	Note Reload the FEX for the MTU change to take effect.

If you want to avoid reloading the FEX, you can configure an explicit connectionless network service (CLNS) MTU size on the IA client and peer ports as shown in the following example:

```
Router# configure terminal
Router(config)# interface interface Gig118/1/0/1
Router(config-if)# ip router isis
Router(config-if)# clns mtu 1497
```