

Cisco Catalyst Instant Access

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General Information

Q. What is Cisco Catalyst® Instant Access?

A. Instant Access is a solution that uses Cisco IOS® Software to connect Cisco® Catalyst 6800ia access switches to Cisco Catalyst 6500 or 6800 Series core switches. Once connected, the entire configuration works as a single extended switch with a single management domain. The solution is intended to simplify your campus network operations and management.

Q. Is Instant Access similar to the Cisco Nexus® Fabric Extender (FEX) solution?

A. Yes, and there is a consistent command-line interface (CLI) across the two solutions. The primary difference is that Instant Access is customized to meet enterprise campus network needs, while the FEX solution is better suited to data center switching requirements.

Q. How does Instant Access meet campus network needs?

A. It supports features such as switch stacking, Power over Ethernet (PoE) and Power over Ethernet Plus (PoE+), Security Group Tagging (SGT), Multiprotocol Label Switching (MPLS), Easy Virtual Network (EVN), and other premium Catalyst 6800 features in the access network. It also supports remote switches.

Q. What are the different components of the Instant Access solution?

A. Instant Access requires Cisco Catalyst 6800ia, C3560CX-12PD-S, or C3560CX-8XPD-S compact switches as “Instant Access clients” along with Cisco Catalyst 6500 or 6800 Series backbone switches as “Instant Access parents.” The 6500 or 6800 switches must be configured for Virtual Switching System (VSS) mode. We recommend having a pair of switches to provide the maximum level of redundancy and load balancing.

Note:

1. In networks where a pair of Cisco Catalyst 6500/6800 switches is not available, a single Cisco Catalyst 6500 or 6800 switch may be used when configured for VSS mode.
2. 3560-CX compact switches are not supported in Catalyst 6840 family as Instant Access Client.

Q. What Cisco IOS Software release number will support Instant Access?

A. Cisco IOS Software 15.1(2)SY and later on the Cisco Catalyst 6500 and 6800 switches support Instant Access.

Q. Is a special software license required for Instant Access?

A. No, the solution is supported with the IP Services licensed feature set on the Cisco Catalyst 6500 and 6800 and does not require any additional licenses.

Q. How many ports can we deploy in a single Instant Access domain?

A. The Cisco 15.1(2)SY IOS release supports a maximum of 1,000 Instant Access host ports across 21 Instant Access clients. The Cisco 15.2(1)SY IOS release supports a maximum of 2,000 Instant Access host ports across 42 Instant Access clients.

Note: Newer code versions may scale the number of clients and ports higher, so check the latest software release notes for these numbers.

Q. How many Instant Access clients can an Instant Access parent support?

A. The Cisco 15.1(2)SY IOS release supports a maximum of 21 Instant Access clients, distributed over a maximum of 12 Instant Access (FEX) IDs. The Cisco 15.2(1)SY IOS release supports a maximum of 42 Instant Access clients, distributed over a maximum of 42 Instant Access (FEX) IDs.

Note: Newer code versions may scale the number of clients and ports higher, so check the latest software release notes for these numbers.

Configuration Options and Information

- Q.** Are there any limitations w.r.to number of 802.1x/MAB ports & sessions which can be enabled on the instant access interfaces?
- A.** Yes, with Cisco 15.2(1)SY IOS release, on the IA parent maximum of 2016 instant access ports (across 42 Catalyst 6800IA access switches) can be enabled with 802.1x/MAB in IBNS2.0 (Identity Based Networking Services v2.0) with one client per port.
- Q.** Which Cisco Catalyst 6500 or 6800 Series Switches are supported as Instant Access parents?
- A.** An Instant Access parent can be:
- A Cisco Catalyst 6500-E with Supervisor 2T and an Instant Access-capable line card
 - A Cisco Catalyst 6807-XL with Supervisor 2T and an Instant Access-capable line card
 - A Cisco Catalyst 6880-X or Cisco Catalyst 6840-X with 10-Gbps ports
- Q.** Which Cisco Catalyst 6500 or 6800 series line cards are Instant Access- capable?
- A.** Instant Access is supported on the following:
- WS-X6904-40G with a CVR-4SFP10G converter
 - C6800-32P10G or 16P10G and 8P10G variants with a Cisco Catalyst 6500-E or 6807-XL and Supervisor2T
 - C6880-X-16P10G with Cisco Catalyst C6880-X
- Q.** How many 10-Gbps uplinks can be bundled in a single Multichassis EtherChannel (MEC) from an Instant Access client stack to an Instant Access parent?
- A.** Up to eight 10-Gbps uplinks can be bundled (two 10-Gbps uplinks per stack member) from an Instant Access client stack to an Instant Access parent.
- Q.** Can an Instant Access client dual-home to two different Catalyst 6500 or 6800 Instant Access-capable line cards over an MEC link?
- A.** Yes, the fabric links can span multiple Instant Access-capable line cards in either a single Cisco Catalyst 6500 or 6800 chassis or across the VSS. This provides line-card-level redundancy at the Instant Access parent.
- Q.** What is the distance limitation between the Instant Access parent and the Instant Access client?
- A.** The fabric links are based on 10 Gigabit Ethernet links between the parent and the client. Both fiber and copper options are supported. The only distance limitation is based on the transceivers and related cables used. For information about transceivers supported, refer to the next question.
- Q.** What transceivers are supported between Instant Access client and parent 10-Gbps links?
- A.** The Cisco Catalyst 6800ia has two 10 Gigabit Ethernet SFP+ uplink ports. The ports support Short-Reach (SR), Long-Reach (LR), Long-Reach Multimode (LRM), and Extended-Reach (ER) Small Form-Factor Pluggable Plus (SFP+) fiber transceivers and associated MMF or SMF fiber cables. They also support 1M, 3M, and 5M copper Twinax cables.

Note: The Cisco-FET-10G is not supported in the Instant Access solution. Refer to the [10 Gigabit Ethernet Transceiver Modules Compatibility Matrix](#) for more details.

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- Q.** How many Instant Access clients can be stacked, and what is the stacking bandwidth?
- A.** The Cisco 15.1(2)SY IOS release supports a maximum of three Instant Access clients in a stack. The Cisco 15.2(1)SY IOS release supports a maximum of five Instant Access clients a stack. Catalyst 6800ia stacking cables provide a bidirectional stack bandwidth of 80 Gbps.
- Note:** Newer code versions may scale the number of stack members (and uplink ports) higher, so check the latest software release notes for these numbers.
- Q.** Is the stacking module included with the 6800ia Instant Access client?
- A.** Yes, the stacking module is built in and included with the 6800ia Instant Access client. No additional purchase is necessary.
- Q.** Does the Instant Access client support dual power supplies to support IP phone deployments?
- A.** Yes, the C6800ia-48FPDR is the Instant Access client SKU with onboard redundant power supply. Additionally, an RPS2300 as external redundant power supply is supported on all 6800ia clients.
- Q.** Does the Cisco Catalyst 6800ia client support Cisco StackPower®?
- A.** No.
- Q.** Can the Instant Access solution and a traditional campus deployment coexist in the same Cisco Catalyst 6500 or 6800 VSS?
- A.** Yes. Both traditional network deployments (such as Cisco Catalyst 2960, 3650, 3850, 4500, and 4900 Series access switches) and the Cisco Catalyst 6800ia can coexist when connected to a single Cisco Catalyst 6500 or 6800 VSS at the distribution layer.
- Q.** Can some ports of the Instant Access-capable line card be used for the Instant Access solution and other ports for traditional network trunk and or IP routed access?
- A.** Yes. All of the Instant Access-capable line cards can support both Instant Access connectivity to a Cisco Catalyst 6800ia simultaneously with connectivity to traditional Layer 2 and Layer 3 Cisco Catalyst 2000, 3000, and 4000 Series Switches. The line card can operate in 1-, 10-, and 40-Gbps modes simultaneously, with some port groups configured in 40-Gbps mode and others in 10-Gbps mode. 10-Gbps mode is required to support Instant Access.
- Q.** Can the 6800ia uplink support 1-Gbps SFP instead of 10-Gbps SFP+?
- A.** Yes. Cisco IOS Software 15.1(2)SY2 and later releases support 1-Gbps SFP uplinks on 6800ia as well. For maximum bandwidth we recommend using 10-Gbps uplinks.
- Q.** Can a compact switch be connected to an Instant Access client?
- A.** Yes. A single compact switch can be connected to 6800 Instant Access client host port.
- Note:** The 6800ia switch is an access layer switch and is not intended to be used at the aggregation layer. Any remotely connected switches are not part of the Instant Access domain, so they are independently managed and operate the same as when directly connected to the Catalyst 6500 or 6800 switch.
- Q.** Are there any trunk port/vlan limitations per FEX-ID?
- A.** Yes. Each FEX ID can have up to 4 trunk ports and up to 20 vlans.
- Q.** Does the Cisco Catalyst 6800ia support PoE and PoE+?
- A.** Yes, the Cisco Catalyst 6800ia-48FPD and 48FPDR modules support PoE (15 W) on all 48 10/100/1000Mbps RJ45 ports and PoE+ (30 W) on any 24 of the 10/100/1000 Mbps RJ45 ports, or a combination of them,

with a maximum PoE budget of 740 W. Refer to the [Cisco Catalyst 6800ia data sheet](#) for more details and a complete list of capabilities.

Note: New Instant Access-capable Cisco Catalyst C3560CX-12PD-S and C3560CX-8XPD-S compact switches can also support 12 PoE+ and 8 PoE+ respectively with a maximum PoE budget of 240 W.

- Q.** Can wireless access points be directly connected to an Instant Access client?
- A.** Yes, access points can be directly connected and powered by the PoE/PoE+ capabilities of the Instant Access client.
- Q.** Can the WS-X6908-10G line card be used for 10-Gbps fabric link termination at the Instant Access parent?
- A.** No.
- Q.** Can the existing Cisco Catalyst 2960S and 2960X switches be used as Instant Access clients?
- A.** No.
- Q.** Can the Cisco Catalyst 6800ia be configured to operate as a standalone switch in non-FEX mode?
- A.** No, a Cisco Catalyst 6800ia can operate only in Instant Access client mode and does not support any local switching. However, the new Instant Access-capable Cisco Catalyst C3560CX-12PD-S and C3560CX-8XPD-S compact switches can operate as standalone switches in non-FEX mode.
- Q.** Does Instant Access support EtherChannel with multiple host ports on a single Cisco Catalyst 6800ia?
- A.** Yes. Cisco IOS Software Release 15.1(2)SY2 supports up to two Instant Access host ports, per port channel, on a single Instant Access client or in the same Instant Access stack. Cisco IOS Software Release 15.2(1)SY1 and later can support up to eight Instant Access host ports, per port channel, on a single Instant Access client or in the same Instant Access stack. A total of 23 host port channels are supported per Instant Access stack.
- Q.** Does Instant Access support MEC across multiple Instant Access (FEX) IDs?
- A.** No. MEC across multiple Instant Access (FEX) IDs is not supported.
- Q.** What is the oversubscription on the Cisco Catalyst 6800ia?
- A.** Each Cisco Catalyst 6800ia supports 48 10/100/1000Mbps RJ45 host ports and two 10 Gbps SFP+ uplinks. This is a default subscription ratio of 2.4:1 (48/20) across the links to the Instant Access parent.
- Q.** Must I have two Catalyst 6500 or 6800 switches in VSS mode as Instant Access parent, or can one switch function as Instant Access parent?
- A.** It is recommended to have two switches (a pair of Cisco Catalyst 6500-E or C6807-XL or C6880-X or C6840-X switches) configured in VSS mode as your Instant Access parent for high-availability networking. However, a single Cisco Catalyst 6500-E or 6807-XL with Supervisor 2T or 6880-X or 6840-X can be used as Instant Access parent when configured in VSS mode (without physical redundancy of the second switch). Instant Access technology uses VSS software code infrastructure to treat remote Instant Access clients as remote line cards, hence the need to enable VSS mode in a single switch acting as Instant Access parent.
- Q.** Is VSS Quad Sup supported with Instant Access?
- A.** Cisco IOS Software Release 15.1(2)SY2 provides VSS Quad Sup support with Instant Access. This only applies to the modular Catalyst 6500-E or 6807-XL with four Supervisor 2Ts. The Catalyst C6880-X and C6840-X are fixed systems.

- Q. Why is the default configuration of Instant Access client host port configuration “switch trunk allowed vlan 1” and not “all”?
- A. Each Instant Access host port can be configured in access or trunk mode (default is dynamic). If in trunk mode, there is a constraint as to how many VLANs can be trunked on each port.

Note: No more than 1,000 VLANs can be associated with a single FEX ID, divided by the number of Instant Access trunk ports. To make sure that this constraint is followed, implementation requires specifying explicitly which VLANs will be trunked. We recommend no more than 20 VLANs per Instant Access trunk port (up to the total of 1000 per FEX), to limit the amount of BPDU processing.

- Q. What is the purpose of the Cisco Catalyst 6800ia management and console ports?
- A. The RJ45 serial console and Ethernet management ports are not required for Instant Access client operations on a day-to-day basis, because the client provisioning happens automatically. Once the Instant Access client is registered and provisioned by the Instant Access parent, the console is no longer usable. However, these ports are active whenever the 6800ia is not connected and allow Cisco Technical Assistance Center (TAC) engineers to access the local system.
- Q. Can we support services modules together with the Instant Access solution?
- A. Yes. Services modules can be deployed in the Instant Access parent (Cisco Catalyst 6500-E or 6807-XL switch).

Client Provisioning

- Q. How are new Instant Access clients provisioned? Must any configuration and image upgrades be done at the Instant Access client?
- A. Instant Access clients provision themselves automatically when they connect to an Instant Access parent. The Instant Access parent automatically does an image check on the newly connected Instant Access client. If the Instant Access client image is different from the image on the Instant Access parent, the Instant Access client is automatically upgraded with the newer Instant Access client image. Instant Access client uplinks are also configured automatically by the control protocols running between Instant Access parent and Instant Access client, thus making the access layer truly plug and play. Instant Access client stack members are automatically provisioned when connected.

Communications and Traffic Flows

- Q. Is local switching supported on the Instant Access client?
- A. No. The Instant Access client does not support any local switching. All of the Layer 2 switching, Layer 3 routing, and MPLS, etc. happens on the Instant Access parent. Because all the forwarding decisions are made by the Instant Access parent switch, the breadth of features available in these platforms extends to the access layer. For more details, refer to the [Instant Access white paper](#).

Note: The new Instant Access-capable Cisco Catalyst C3560CX-12PD-S and C3560CX-8XPD-S compact switches do support local switching, when operating in non-FEX mode (standalone mode).

- Q. Is there local multicast replication on the Cisco Catalyst 6800ia?
- A. The Cisco Catalyst 6800ia supports local Layer 2 replication of multicast flows within the same VLAN. Multicast destination lookups are performed by the Instant Access parent; however, the replication of the multicast flows destined for the host from an Instant Access client occurs locally on that client.

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- Q.** How does the traffic flow between two hosts directly connected to Instant Access clients?
- A.** Host-to-host traffic flows through the Instant Access parent. The actual forwarding of packets happens at the distributed forwarding engine (DFC4) in the 6904-10G or C6800-32P10G or C6800-16P10G or C6800-8P10G line card at the Instant Access parent. For more details, refer to the [Instant Access white paper](#).

Q. How exactly does the Instant Access client communicate with the Instant Access parent?

A. Instant Access client and parent communicate over four control protocols:

- Satellite Discovery Protocol (SDP)
- Satellite Registration Protocol (SRP)
- Switch Configuration Protocol (SCP)
- Inter-Process Communication and Inter-Card Communication (IPC/ICC)

SDP and SRP are new protocols that manage the automatic discovery and registration of new Instant Access clients. SCP and IPC/ICC are the same protocols used by the Cisco Catalyst 6500 and 6800 to manage installation and programming of modular line cards. These protocols are at the heart of the Instant Access solution, enabling automatic provisioning and a single point of management for distribution and access network layers. For more information, refer to the [Instant Access white paper](#).

Q. What effect does the Instant Access control protocol between Instant Access parent and client have on the MEC links?

A. Four control protocols run between Instant Access parent and Instant Access client: SDP, SRP, SCP, and IPC/ICC. These control protocols are lightweight and run transparently and automatically in the background. No additional user configuration is required.

Q. How much packet buffer is available on 6800ia ports?

A. The 6800ia supports 4 MB of shared buffers across all 48 ports.

Q. What is the code upgrade process for an Instant Access client?

A. The Instant Access solution supports Enhanced Fast Software Upgrade (eFSU) using the In-Service Software Upgrade (ISSU) software infrastructure. An additional CLI is introduced (`issu runversion [fex [range] <num> | all->]`) to allow the upgrade of Instant Access clients during the eFSU process. It supports the capability to do a rolling upgrade of all Instant Access clients or to perform upgrades one at a time.

Management

Q. Does Cisco Prime™ infrastructure support the Instant Access solution?

A. Yes, Cisco Prime infrastructure 2.0 and later provides monitoring and configuration support of Instant Access, including list of interfaces, port configuration, status of interfaces, list of Instant Access clients, performance of interfaces, interfaces utilization graph, and many other day-two management capabilities.

Note: Instant Access client provisioning, image management, and VSS will be supported in future releases of Cisco Prime infrastructure.

Features and Routing Protocols

Q. What features are supported at Cisco Catalyst 6800ia client host ports?

A. The Instant Access solution brings Cisco Catalyst 6500 and 6800 features to the access layer. These include, but are not limited to:

- Layer 2: Spanning Tree, VLAN Trunking Protocol (VTP), Multiprotocol Label Switching (MPLS), Port Aggregation Protocol (PAgP), Link Aggregation Protocol (LAP), Cisco Discovery Protocol (CDP), Link Layer Discovery Protocol (LLDP), and Advanced Virtual Private LAN Services (A-VPLS)
- Layer 3: IPv4, IPv6, IP multicast, Easy Virtual Network (EVN), Virtual Routing and Forwarding (e.g., VRF-lite), MPLS, Generic Routing Encapsulation (GRE), and Medianet

- Security: 802.1x, Web-Auth, MAB, Security Group Tagging, Security Group Access List, ACL
- Network monitoring: Flexible NetFlow, SPAN/RSPAN/ERSPAN, Embedded Event Manager (EEM)

Q. What are the quality-of-service (QoS) capabilities of the Instant Access solution?

A. Prior to Cisco IOS Software Release 15.1(2)SY5 and 15.2(1)SY1, Instant Access host ports and FEX-fabric uplink ports operate in trust differentiated services code point (DSCP) mode with no packet modification. The 6800ia client supports four queues: one priority and three standard queues (1p3q4t) for host ports and 10 Gbps fabric uplinks toward an Instant Access parent. A packet already marked with DSCP will be queued based on the default table-map preconfigured as shown in the following output and queued into priority or standard queue based on its DSCP marking:

```
Switch1#show queuing interface gigabitEthernet 122/1/0/43
queuing strategy:  Weighted Round-Robin
```

```
Queuing on Gi122/1/0/43: Tx Enabled Rx Disabled
```

```
Queuing Mode In Tx direction: mode-dscp
```

```
Transmit queues [type = 1p3q3t]:
```

```
Queue Id      Scheduling  Num of thresholds
```

```
-----
```

```
  1           Priority           3
  2,3,4       WRR                3
```

```
WRR bandwidth ratios: 100[queue 1] 100[queue 2] 100[queue 3]
```

```
queue-limit ratios:  20[Pri Queue]  15[queue 2]  25[queue 3]  40[queue 4]
```

```
queue thresh dscp-map
```

```
-----
```

```
 1      1
 1      2
 1      3      32 33 40 41 42 43 44 45 46 47
 2      1      16 17 18 19 20 21 22 23 26 27 28 29 30 31 34 35 36 37 38 39
 2      2      24
 2      3      48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
 3      1      25
 3      2
 3      3      0 1 2 3 4 5 6 7
 4      1      8 9 11 13 15
 4      2      10 12 14
 4      3
```

With Cisco IOS Software Release 15.1(2)SY5 and 15.2(1)SY1 and later releases, it is possible to reconfigure the default 6800ia queuing configuration. All other QoS principles still apply. A custom 6800ia queuing configuration applies to all ports in the Instant Access switch and/or stack. For more details, refer to the [Cisco Catalyst Instant Access white paper](#).

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- Q.** Is QoS supported over MEC uplinks?
- A.** The Instant Access solution uses a trust-DSCP class-of-service (CoS) model between the Instant Access client and the Instant Access parent. The frame's original DSCP CoS values are maintained, and the frame is queued for transmission over the fabric link according to its DSCP CoS markings. The DSCP CoS-to-queue table maps are configured by default in both the client and parent and cannot be changed. All control traffic is treated as high-priority traffic. For more details, refer to the [Cisco Catalyst Instant Access white paper](#).
- Q.** Are there restrictions on the routing protocols we can use?
- A.** All routing protocols supported on an Instant Access parent can be enabled on the Instant Access client host ports. A Cisco Catalyst 6500 or 6800 switch supports all current routing protocols (for example, RIP, EIGRP, OSPF, IS-IS, BGP, LISP, and MPLS/VPLS), and all of them are supported on Instant Access host ports.
- Note:** The Instant Access client host ports default to Layer 2 switchports and require a "no switchport" to configure Layer 3 features.

Power Rating

- Q.** What are the power supply rating and heat dissipation of C6800ia Instant Access clients?
- A.** The power supply rating for C6800ia-48FPD (PoE+) is 100 - 240 V with current at 9A-4A, frequency at 50 Hz-60 Hz, with power consumption of 149 W, 508 BTU per hour. C6800ia-48TD (non-PoE) power rating is 100 - 240 V with current at 0.5A-1A, frequency at 50 Hz-60 Hz, with power consumption of 47 W at 161 BTU per hour. For more information, refer to hardware details in the [6800ia product data sheet](#).



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