



ExtremeSwitching™

Configuring Fabric Attach on Ethernet Routing Switch 3500 Series

Release 5.3.6
NN47203-505
Issue 03.01
December 2017

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Chapter 1: Preface

Purpose

This document provides instructions to configure Fabric Attach on the switch.

Training

Ongoing product training is available. For more information or to register, you can access the Web site at www.extremenetworks.com/education/.

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6. Select the industry in which your company operates.
7. Confirm your geographic information is correct.
8. Select the products for which you would like to receive notifications.
9. Click **Submit**.

Chapter 2: New in this document

There are no new feature changes in this release.

Chapter 3: Fabric Attach fundamentals

Fabric Attach (FA) extends the fabric edge to devices that do not support Shortest Path Bridging MAC (SPBM). With FA, non-SPBM devices can take advantage of full SPBM support, when support is available.

FA also decreases the configuration requirements on SPBM devices by off-loading some configuration to the attached non-SPBM devices and by automating certain configuration steps that occur most often.

FA Signaling

The FA elements communicate between themselves using FA Signaling. FA Signaling is an application level protocol that leverages standard network protocols, such as LLDP, to exchange messages and data between FA elements to orchestrate network automation.

FA Network Elements

The FA architecture involves the following FA elements:

- **FA Server**—An SPB capable network device connected to the fabric edge running the FA agent in FA Server mode. FA Servers receive requests to create services with specific I-SID/VLAN bindings.

In the SPBM architecture an FA Server is a BEB. FA servers process requests for service creation from FA Proxy and/or FA Clients. An FA Server can operate in SPBM or VLAN provisioning mode.

- **FA Proxy**—A device running the FA agent in FA Proxy mode.

An FA Proxy device may be capable of running SPB or not. SPB is always disabled on devices running FA Proxy. FA Proxy mode is enabled by default on devices supporting this mode.

FA Proxies support I-SID/VLAN assignment definition and have the ability to advertise these assignments for possible use by an FA Server, if connectivity permits.

- **FA Client**—A non-SPB network attached device running the FA agent in FA Client mode and able to advertise ISID/VLAN binding requests for service creation to an FA Proxy or FA Server.
- **FA Standalone Proxy**—An FA device running the FA agent in FA Standalone Proxy mode. FA Standalone Proxy supports FA Proxy functionality in environments without an FA Server.

An FA Standalone Proxy can be used to automate the configuration of traditional VLANs for devices connected to it, such as WLAN Access Points.

The FA Standalone Proxy does not send provisioning requests upstream. An FA Standalone Proxy automatically accepts requests from FA clients and assumes that the upstream network has been provisioned appropriately.

FA Standalone Proxy can be used in environments where the devices upstream from the FA Standalone Proxy do not support Fabric Attach, but the devices downstream from it support Fabric Attach.

*** Note:**

This release supports FA Proxy functionality (on ERS 3510 only) and Standalone Proxy operation.

FA Element Discovery

An FA agent which controls FA functionality resides on all FA-capable devices (FA Server, FA Proxy, FA Standalone Proxy or FA Client). No agent-specific configuration is necessary.

FA Proxy and FA Server elements control FA through a global FA service setting (global SPBM setting) and through per-port settings that control the transmission of FA information using FA Signaling.

The first stage of establishing FA connectivity involves element discovery. In order for FA discovery to function, FA service and per-port settings must be enabled. Once these settings are enabled, the FA agent advertises its capabilities (FA Server, FA Proxy or FA Client) through FA Signaling. Following discovery, an FA agent is aware of all FA services currently provided by the network elements to which it is directly connected. Based on this information, an FA Client or an FA Proxy agent can determine whether FA data (I-SID/VLAN assignments) should be exported to an FA Proxy that acts as an external client proxy or an FA Server.

Per-port settings are, by default, enabled on FA Proxies and disabled on FA Servers.

*** Note:**

An FA Proxy can communicate with, at most, one FA Server at a time. If multiple server connections exist, the first discovered server is considered the primary server. Multiple links (trunked) to a single server are supported as long as they form a logical interface. Multiple non-trunked links are not supported and data received on non-primary ports is ignored by an FA Proxy. FA Proxies or FA Clients can connect through a LAG/MLT to two FA Servers which form a Split-LAG or SMLT pair. Connections which may create loops, to multiple servers that are not in Split-LAG or SMLT mode, are not supported.

An FA Server can communicate with multiple, different FA Proxies and FA Clients.

FA agent startup and initialization

During the FA agent startup and initialization sequence, the following are restored from non-volatile memory:

- FA service status

- FA port-level settings
- external client proxy status
- message authentication status and keys for all ports
- previously configured I-SID/VLAN assignments
- Zero Touch settings
- FA Standalone Proxy settings
- extended logging support

In a stack environment, FA agent startup and initialization occurs on every unit in the stack, using the data restored from non-volatile memory.

The initialization sequence can also include operations geared towards cleaning-up settings that were previously configured in support of FA I-SID/VLAN assignments that were active on an FA Proxy or an FA Server before a system reset.

FA Proxy I-SID-to-VLAN assignment

Note:

The following section applies to ERS 3510 only.

Although administrators may configure I-SID-to-VLAN bindings on FA Proxies, I-SID-to-VLAN bindings are typically received by FA Proxies from FA Clients. If external client proxy support is enabled, standard processing requirements for bindings received from an FA Client are managed the same way that processing requirements for locally configured bindings are managed.

If an I-SID-to-VLAN assignment is accepted by the FA Server, the assignment state is updated to *active*. If an I-SID-to-VLAN assignment is not accepted by the FA Server, the assignment state is updated to *rejected*.

The FA Proxy receives and displays assignment status information from the FA Server for each pending I-SID-to-VLAN assignment. Possible responses include:

- Assignment accepted (2)
- Rejection: generic (3)
- Rejection: Fabric Attach resources unavailable (4)
- Rejection: VLAN invalid (6)
- Rejection: VLAN resources unavailable (8)
- Rejection: application interaction issue (9)

*** Note:**

Data exchanges (I-SID/VLAN assignments) between an FA Proxy and an FA Server/FA Client are supported, as are exchanges between an FA Server and an FA Proxy/FA Client. FA Proxy to FA Proxy and FA Server to FA Server interactions are not supported.

FA data processing

*** Note:**

This section applies to ERS 3510 only.

Following discovery, an FA Proxy or FA Client transmits locally-defined I-SID/VLAN assignments through FA Signaling to an FA Server, which accepts or rejects these assignments.

The I-SID/VLAN assignment acceptance by the server can require actions to be performed by the FA agent on both the FA Proxy and the FA Server, to appropriately configure the communication channel (uplink) between the FA Proxy or FA Client and FA Server. Most actions undertaken based on assignment acceptance are undone when the I-SID/VLAN assignment is no longer needed.

I-SID/VLAN assignment rejection by the FA Server requires the FA Proxy to clean up any settings that the FA agent made related to feature operation, as well as log the rejection and any associated error type information for later analysis by an administrator. The amount of clean-up required depends on whether the port VLAN membership was established by the FA Proxy agent or by the administrator outside of the FA feature operation. An uplink port that is associated with a VLAN because of an accepted FA Proxy I-SID/VLAN assignment, and not because of an explicit administrator port VLAN membership action, will have the port VLAN membership cleared when the related I-SID/VLAN assignment is rejected by the FA Server or deleted by the FA Proxy administrator. *The port tagging status will remain in effect regardless of I-SID/VLAN assignment status, once it has been established by the FA agent.*

VLANs that are automatically created on an FA Proxy due to I-SID/VLAN assignment acceptance are automatically deleted when bindings are rejected or deleted.

No more than a single log message is generated for a rejected I-SID/VLAN assignment, regardless of how many times the assignments have been requested and rejected. Assignments that are rejected, accepted, and later rejected result in a log message being generated for each “new” rejection (two I-SID/VLAN assignment rejection log messages are generated in this case).

FA Proxy I-SID/VLAN assignment addition actions:

- Create port-based VLAN corresponding to I-SID/VLAN assignment VLAN.
- Update port VLAN membership to include I-SID/VLAN assignment VLAN.
- Update port VLAN tagging status to ensure egress traffic is tagged.

FA Server I-SID/VLAN assignment addition actions:

- Create SPBM switched UNI VLAN corresponding to I-SID/VLAN assignment VLAN.
 - C-VLAN join operation does not initiate VLAN creation (VLAN already exists and is associated with the I-SID/VLAN binding I-SID).
- Update downlink port VLAN tagging status to ensure egress traffic is tagged. Tagging status for FA client connections is determined by the client link tagging requirements.
- Update I-SID/VLAN mapping data to ensure Shortest Path Bridging-MAC (SPBM)-switched UNI support is enabled for the I-SID/VLAN/port tuple (in other words, create switched UNI). Port VLAN membership is updated by this action.

Additional actions can be required for I-SID/VLAN binding state transitions involving FA Client-generated data. The communication channel (that is, the downlink) between the FA Client and FA Proxy must be appropriately configured. This can require actions to be performed on the switch.

FA Proxy external client proxy I-SID/VLAN assignment addition actions:

- Update downlink port VLAN membership to include I-SID/VLAN assignment VLAN.
- Update downlink port VLAN tagging status based on the FA Client state data (tagged – ‘tagAll’/ untagged – ‘untagPvidOnly’).

Each of these actions is performed by the FA Proxy and FA Server for each I-SID/VLAN assignment, unless the required data/settings have already been configured by the administrator. The successful transition from ‘pending’ to ‘active’ is gated by the successful completion of these actions. The FA agent tracks which settings have been updated based on I-SID/VLAN assignment processing (comparing them with settings established by the administrator), and cleans-up or undoes the settings that are related to I-SID/VLAN assignment support as much as possible when an assignment is no longer needed.

I-SID/VLAN assignment state transitions from ‘active’ to ‘rejected’ require complementary actions be performed by the FA Proxy and the FA Server to eliminate assignment-related settings:

FA Proxy I-SID/VLAN assignment deletion actions:

- Update uplink port VLAN membership to exclude I-SID/VLAN assignment VLAN.
- Delete port-based VLAN corresponding to I-SID/VLAN assignment VLAN. *Uplink port VLAN tagging status remains unchanged.*

FA Server I-SID/VLAN assignment deletion actions:

- Delete I-SID/VLAN/port association data to disable SPBM-switched UNI support for the I- SID/ VLAN/port tuple (to delete switched UNI). This action updates port VLAN membership.
- Delete SPBM-switched UNI VLAN corresponding to I-SID/VLAN assignment VLAN.
 - Previously joined C-VLANs are not deleted.

State transitions related to FA Client-generated bindings require additional complementary actions to be performed by the FA Proxy to eliminate assignment-related settings:

FA Proxy external client proxy I-SID/VLAN assignment deletion actions:

- Update downlink port VLAN membership to exclude I-SID/VLAN assignment VLAN.
- Delete port-based VLAN corresponding to I-SID/VLAN assignment VLAN.

*** Note:**

Downlink port VLAN tagging status remains unchanged

Assignment status data returned by the FA Server for each pending I-SID/VLAN assignment drives the FA Proxy response processing. Assignment rejections can include information to indicate the reason for the rejection.

Rejection error codes include:

- FA resources unavailable(4)—the resources that are required for the FA agent to support additional I-SID/VLAN assignments are currently exhausted. The maximum number of assignments that can be supported has been reached.
- VLAN invalid(6)—the specified VLAN can't be used to create a switched UNI at this time. The VLAN already exists and is either inactive or has an incorrect type for this application. This error is also returned if an FA Client or FA Proxy exports an bindings with an I-SID value of 0 and SPBM provisioning is enabled.
- VLAN resources unavailable(8)—the maximum number of VLANs that can be supported by the device has been reached.
- Application interaction issue(9)—a failure has been detected during FA interactions with the VLAN and/or the SPBM applications. The VLAN operations to create the required SPBM switched UNI VLAN or enable port tagging may have failed or the SPBM operation to create the switched UNI may have failed.

As with the actions initiated to support an assignment addition, actions related to assignment deletion are performed only if the targeted data was created during the I-SID/VLAN assignment addition phase. Previously-existing configuration data is not changed. No artifacts are left behind to indicate that automated operations have taken place, following an addition or deletion sequence. This goal may not always be achievable but all attempts are made to satisfy this requirement.

In addition to explicit I-SID/VLAN assignment state transitions, several events can occur that initiate assignment deletion processing. These include:

- I-SID/VLAN assignment timeout—A “last updated” timestamp is associated with all active assignments on the FA Server. When this value is not updated for a predetermined amount of time, the I-SID/VLAN assignment is considered obsolete. Obsolete assignment data and related settings are removed by the FA server agent. The timeout duration value allows FA Server settings to be maintained if temporary connectivity issues are encountered.

I-SID/VLAN binding timeout is also performed by an FA Proxy when it is providing client proxy services and FA Client data is present. Processing similar to that performed by the FA Server related to data aging is supported.

- I-SID/VLAN assignment list updates—The current I-SID/VLAN assignment list is advertised by an FA Proxy at regular intervals (dictated by FA Signaling). During processing of this data, an FA Server must handle list updates and delete assignments from previous advertisements that

are no longer present. Though these entries would be processed appropriately when they timeout, the FA agent attempts to update the data in real-time and initiates deletion immediately upon detection of this condition.

- FA Server inactivity timeout—If primary FA Server advertisements are not received for a predetermined amount of time, the I-SID/VLAN assignments accepted by the server are considered rejected. I-SID/VLAN assignment data is defaulted (reverts to the 'pending' state) and related settings are removed by the FA Proxy agent. The timeout duration value has been chosen to allow FA Proxy settings to be maintained if temporary connectivity issues are encountered.

You can configure the timeout value used for FA device or binding aging with the `fa timeout` command. The default value is 240 seconds.

FA Proxy and FA Server connection maintenance

Note:

This section applies to ERS 3510 only.

An FA Proxy can only interact with one FA Server at a time. If multiple server connections exist, the first discovered server is considered the primary server. All other servers discovered after this point in time are considered alternates. Typically only a single FA Server is discovered. If multiple servers are discovered, an indication is logged to identify this situation in case it is not intended. I-SID/VLAN assignment data is only exchanged between the FA Proxy and the primary FA Server.

When using LACP for uplink/downlink trunk, ports should be aggregated into a trunk and the LACP key should explicitly be associated with a MLT ID through the LACP Key/MLT ID mapping table.

Primary server failure is detected using a capabilities advertisement timeout. Once a predefined period of time without an FA Server advertisement from the current primary server expires, the primary server becomes undefined. Any FA Proxy I-SID/VLAN assignments previously accepted by the server are defaulted (reset to the 'pending' state) and related settings are cleared. An informational message (primary server lost) is logged when this transition occurs. I-SID/VLAN assignment data is not advertised until a new primary FA Server is selected. The same algorithm used at startup to select an initial primary server is used to select a new primary server.

FA Proxy/FA Server connectivity using Multi-link Trunking (MLT), Distributed Multi-Link Trunking (DMLT) or Split Multi-Link Trunking (SMLT) connections is supported.

Multiple links associated with the same trunk are treated as a single logical connection. The FA agent reconciles any issues related to MLT, DMLT and SMLT server connectivity and recognizes server uniqueness in the presence of (potentially) multiple capabilities advertisements (that is, FA Signaling received on multiple ports generated by the same server).

In MLT, DMLT and SMLT environments, FA Signaling is generated and received on all links connecting the FA Proxy and FA Server. An FA Proxy receiving an FA Server advertisement determines if a primary FA Server has been selected. If not, the FA Element System ID associated with an advertising FA Server is saved and primary server selection is completed. Once a primary

server has been selected, system ID data associated with FA Server advertisements received on other ports is compared against the primary server data. If the system ID values are not the same, an error indication is logged. In all cases, the FA Proxy only generates FA Signaling containing I-SID/VLAN assignment data on the interfaces associated with the primary FA Server.

*** Note:**

The FA Element System ID is structured such that the same system ID is generated on all links associated with a trunk connection between an FA Proxy and an FA Server even in an SMLT scenario where different physical devices are acting as a single logical entity.

In an SMLT environment, an FA Server takes additional actions to ensure that data is synchronized on both SMLT aggregation peers. In this configuration, the FA Server that receives and accepts advertised FA I-SID/VLAN assignments is responsible for generating messages that are sent across the Inter-Switch Trunk (IST) to inform the partner aggregation switch about FA settings that have been configured (for example, SPBM switched UNI VLAN). Similar actions are required when I-SID/VLAN assignments are deactivated.

Agent Stacking functionality

The FA agent is able to function in both standalone and stacked configurations. In a stack, the base unit FA agent acts as the master and pushes its configuration settings to all non-base units (NBUs), to synchronize data across all units. FA agents are active on all units and are able to process stack events as well as data distribution messages.

On an FA Proxy, connections to the primary FA Server can exist on any unit in the stack. When the unit with the active FA Proxy-to-FA primary server interface leaves the stack, any I-SID-to-VLAN assignments accepted by the server are aged-out. I-SID-to-VLAN assignment data is restored to the default *pending* state and related settings are removed by the FA Proxy agent.

FA message authentication and integrity protection

In order to secure the FA communication in terms of data integrity and authenticity, a keyed-hash message authentication code transmitted with FA TLV data is used to protect all FA signaling exchanges. The standard HMAC-SHA256 algorithm is used to calculate the message authentication code (digest) involving a cryptographic hash function (SHA-256) in combination with a shared secret key. The key is symmetric (known by both source and destination parties). By default, FA message authentication is enabled and a default key is defined to provide secure communication out-of-the-box.

When FA message authentication is enabled, the FA key (default or configured) is used to generate a Hash-based Message Authentication Code (HMAC) digest that is included in all FA TLVs (the FA Element TLV and the FA I-SID/VLAN Assignment TLV).. Upon receipt, the HMAC digest is recomputed for the TLV data and compared against the digest included in the TLV. If the digests are the same, the data is valid. If not, the data is considered invalid and is ignored.

The FA secure communication setting (enabled/disabled) and the symmetric key data are maintained across resets and restored during FA initialization.

Multiple authentication key support provides support for authentication using multiple keys, a user-defined key and a default key. Key usage can be restricted. Only the user-defined key (strict key-mode) or both the user-defined key followed if necessary by the default key (standard key-mode) can be used for authenticating messages. By default, only the user-defined key (strict key-mode) is used for authentication.

Message authentication status, authentication key and key-mode settings are maintained on a per-port basis.

Information related to authentication failures is passed to the EAP/NEAP agent for forwarding to a FA policy server for potential processing when the following criteria are met:

- the interface on which the FA Client is discovered is EAP/NEAP enabled
- the automated FA Client Port Mode Zero Touch option is enabled for FA Client element type

FA Client ingress interface, element type, authentication status, and related key information can be provided for additional upstream client processing.

FA Clients

FA Clients connect to an FA Proxy through standard, non MAC-in-MAC access ports, advertising configured I-SID/VLAN requests to the FA Server. In this scenario, the FA Proxy acts as a client proxy for the FA Client by passing I-SID/VLAN binding requests to a discovered FA Server and returning assignment status information to the FA Client. FA Clients can connect directly to an FA Server, as well.

Note:

External client proxy support must be enabled on an FA Proxy switch before FA client data is accepted by the FA Proxy. By default, external client proxy support is enabled on an FA Proxy.

I-SID/VLAN bindings received from an FA Client by an FA Proxy acting as a proxy for external clients are processed in much the same way locally administered assignments are processed. FA Proxy response processing takes care of VLAN creation and updates VLAN membership *and tagging of the FA Server uplink port if necessary.*

If the I-SID/VLAN client assignment is rejected by the FA Server, the FA Proxy performs any required clean-up tasks and also logs the rejection and any associated error type information for later analysis by an administrator.

Note:

A user assigned to Fail Open VLAN is not removed from I-SID/VLAN bindings using MHSA mode when the RADIUS server becomes unreachable.

FA Auto Provision

You can use Auto Provision with an FA Server-capable device to take advantage of Fabric Attach functionality in non-SPB environments. Auto Provision allows an FA Proxy device (that is also FA Server-capable) to function as an FA Server when SPBM is disabled. With Auto Provision you can designate the device as an FA Proxy or FA Server.

FA VLAN definitions, configured locally on an FA Proxy or through client processing, transparently replace I-SID/VLAN binding definitions in this scenario and allow all of the automated FA processing, with the exception of switched UNI-related operations, to be performed in the absence of SPBM operations. All existing FA default settings remain unchanged.

The Auto Provision support is set to *proxy* by default on an FA Server. The global SPBM setting always overrides the Auto Provision setting, therefore FA operation in an SPBM environment is not impacted at all by Auto Provision.

An FA Server can operate in SPBM or VLAN provisioning mode. In an SPB environment, when SPBM provisioning is operational, for each VLAN associated with an accepted I-SID/VLAN assignment, the FA Server creates an SPBM switched UNI VLAN, if the VLAN does not already exist. In a non-SPB environment, when VLAN auto-provisioning is operational, the FA Server creates port-based VLANs instead of SPBM switched UNI VLANs.

Once the FA Proxy selects a primary FA Server, the FA Proxy provision mode transitions to the provisioning mode operational on the FA Server.

The current provisioning mode on an FA Server determines the range of I-SID values that are acceptable in the proposed I-SID/VLAN assignment list. When SPBM is enabled, the acceptable I-SID range is 0-16777214. When SPBM Multicast is enabled, the acceptable I-SID range is 0-15999999. When SPBM is disabled and the auto provision mode is set to *server*, the FA Server only accepts bindings with an I-SID value of 0.

EAP and FA

With EAP and FA, FA-capable switches or stacks can forward traffic from EAP/NEAP clients over the SPB cloud. The traffic for authenticated clients is mapped to I-SIDs received from the Extreme Networks Identity Engines RADIUS server.

You must configure the desired bindings for EAP/NEAP clients on the RADIUS server. When confirming the authentication request, the RADIUS server also sends the corresponding binding for the EAP/NEAP client.

After an EAP/NEAP client is disconnected, the switch cleans-up the binding associated with the client, if no other EAP/NEAP client on that port uses it.

When an EAP/NEAP client successfully authenticates on an FA Proxy, the client port becomes a member of the VLAN from the I-SID/VLAN pair. The FA Proxy sends to the FA Server the binding received from the RADIUS server. If the FA Server rejects all the bindings, the client is disconnected. EAP clients are moved from AUTHENTICATED state to HELD state.

*** Note:**

In case of a rejected binding, a delay of up to 30 seconds may exist from the time the client authenticates on the FA Proxy until the FA Server rejection response is received by the FA Proxy. Therefore, EAP client traffic may flow for up to 30 seconds until dropped.

On an FA Server, when an EAP/NEAP device is authenticated and an FA binding is received from the RADIUS server, a switched-UNI is created. This is automatically cleaned-up when the client is disconnected.

Access Points authentication

In MHSa mode, the switch also supports NEAP authentication for Access Points. Because Access Points cannot authenticate via EAP, the MHSa mode was improved as follows:

- MHSa now allows the first connected client to be a NEAP client. For each MAC seen on the port, the switch sends an Access Request to the RADIUS Server. After the first successful authentication, a configured number of auto-learned clients are granted access, as in previous MHSa behavior.
- a new option, 'no-limit', is available for configuring the switch to support an unlimited number of NEAP auto-learned clients. You can use this option when an Access Point connected to the switch supports an indeterminate number of devices.

Previously, after the first successful EAP authentication, the switch allowed only a limited number of auto-learned NEAP clients.

When the 'no-limit' option is enabled, the port forwards the traffic from all the devices on that port, without limiting their number. When the Access Point disconnects, the switch clears the mac-address-table for that port and blocks again all traffic. By default, the 'no-limit' option is disabled.

*** Note:**

EAP ports configured in MHSa mode with AP detected as an FA client will not be added to the Fail Open VLAN.

VSAs

The following is a list of VSAs added to support EAP FA functionality:

VSAs sent from RADIUS server to switch:

- Extreme-Fabric-Attach-VLAN-ISID
This VSA consists of a (VLAN, I-SID) pair.
Multiple (VLAN, I-SID) pairs are processed only in MHSa mode.
- Extreme-Auto-VLAN-Create
If this VSA is set to TRUE, the VLANs received in all (VLAN, I-SID) pairs will be automatically created if they do not exist. This VSA is processed only in MHSa and MHMV modes.
- Extreme-Fabric-Attach-VLAN-PVID
This VSA contains the value of the PVID that should be set on the port with the authenticated client. The Extreme-Fabric-Attach-VLAN-PVID VSA is processed only in MHSa mode.

VSA's sent from switch to RADIUS server:

- Extreme-Fabric-Attach-Mode

This VSA can have the following values:

- 0 or not sent, when Switch is assumed to have no concept of SPB/AutoProv
- 1, when the switch is an FA Server in VLAN provision mode
- 2, when the switch is an FA Server in SPBM mode
- 3, when the switch is an FA Proxy with the connected FA Server in VLAN provision mode
- 4, when the switch is an FA Proxy with the connected FA Server in SPBM mode
- 5, when the switch is a FA Standalone Proxy

- Extreme-Fabric-Attach-Client-Type

This VSA can have the following values:

- 1, FA Element Type Other
- 2, FA Server
- 3, FA Proxy
- 4, FA Server No Authentication
- 5, FA Proxy No Authentication
- 6, FA Client – Wireless AP Type 1 [clients direct network attachment]
- 7, FA Client – Wireless Ap Type 2 [clients tunneled to controller]

- Extreme-Fabric-Attach-Client-Id

This VSA contains the MAC address of the FA client, exported via FA Signaling.

FA Standalone Proxy

FA Standalone Proxy introduces FA Proxy functionality in environments without an FA Server. Regardless of whether the FA Standalone Proxy upstream device is a non-Extreme Networks component or an Extreme Networks device on which FA Server functionality is not available, FA Standalone Proxy operation supports standard FA Proxy processing as if an FA Server has been discovered.

 **Note:**

In FA Standalone Proxy mode, I-SID values are not specified and are implicitly 0. Only bindings with an I-SID value equal to 0 are accepted for processing.

In FA Standalone Proxy mode you must provide the FA Server uplink information, which is typically gathered through FA Server discovery. Once you provide this information, FA Standalone Proxy mode operates as if an FA Server has been discovered and is accepting I-SID/VLAN binding requests. The binding clean-up is similar to an FA Server timeout event, and occurs when the static uplink is deleted and when FA Standalone Proxy operation is disabled.

*** Note:**

No interactions with an FA Server are supported in FA Standalone Proxy mode.

*** Note:**

This release supports FA Proxy functionality (on ERS 3510 only) and Standalone Proxy operation.

*** Note:**

Before creating static uplink over a LAG, it's highly recommended to manually bind LACP-key to an MLT-ID.

When using LACP for uplink trunk, ports should be aggregated into trunk.

Chapter 4: Fabric Attach configuration using the Command Line Interface

This section provides procedural information you can use to configure Fabric Attach (FA) using the Command Line Interface (CLI).

Displaying FA-specific settings

Use this procedure to display the FA configuration status.

Procedure

1. Log on to CLI to enter User EXEC mode.
2. To display the FA configuration status, enter the following command:

```
show fa agent
```

Example

This example shows sample output for the **show fa agent** command in FA Proxy mode.

```
Switch(config)#show fa agent
Fabric Attach Service Status: Enabled
Fabric Attach Element Type: Proxy
Fabric Attach Zero Touch Status: Enabled
Fabric Attach Auto Provision Setting: Proxy
Fabric Attach Provision Mode: Disabled
Fabric Attach Client Proxy Status: Enabled
Fabric Attach Standalone Proxy Status: Disabled
Fabric Attach Agent Timeout: 240 seconds
Fabric Attach Extended Logging Status: Disabled
Fabric Attach Primary Server Id: <none>
Fabric Attach Primary Server Descr: <none>

Switch
```

This example shows sample output for the **show fa agent** command in FA Proxy Standalone mode.

```
Switch(config)#show fa agent
```

```
Fabric Attach Service Status: Enabled
Fabric Attach Element Type: Proxy
Fabric Attach Zero Touch Status: Enabled
Fabric Attach Provision Mode: Legacy
Fabric Attach Client Proxy Status: Enabled
Fabric Attach Standalone Proxy Status: Disabled
Fabric Attach Agent Timeout: 240 seconds
Fabric Attach Extended Logging Status: Disabled

Switch(config)#
```

Displaying Fabric Attach elements

Use this procedure to display discovered Fabric Attach elements.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. To display the discovered FA elements, enter the following:

```
show fa elements [<portlist> | trunk <trunknumber> | element-type
{server | proxy | client} | auth-status {auth-pass | auth-fail |
not-auth} | client-type <6-17>]
```

Example

The following example displays sample output for the `show fa elements` command.

```
=====
Fabric Attach Discovered Elements
=====
UNIT/          MGMT          ELEM ASGN
PORT   TYPE      VLAN  STATE  SYSTEM ID      AUTH AUTH
-----
1/5     Server    1234  T / S  6c:fa:58:dc:fc:00:00:00:01:05  AP  AP
1/36    Client     1     U / D  fc:a8:41:fa:f8:00:00:00:00:24  AP  N
=====

Fabric Attach Authentication Detail
=====
UNIT/          ELEM OPER          ASGN OPER
PORT   EXPANDED TYPE      AUTH STATUS      AUTH STATUS
-----
1/5     Server (Auth)    successAuth      successAuth
1/36    Switch           successAuth      none
State Legend: (Tagging/AutoConfig)
T=Tagged, U=Untagged, D=Disabled, S=Spbm, V=Vlan, I=Invalid
Auth Legend:
AP=Authentication Pass, AF=Authentication Fail, NA=Not Authenticated, N=None
=====
2 out of 2 total number of Fabric Attach discovered elements displayed
=====
```

Field	Definition
State	FA Element TLV state field data
Elem Auth	FA Element TLV authentication status
Asgn Auth	FA I-SID/VLAN Assignment TLV authentication status
Elem Oper Auth Status	FA Element TLV authentication status detail data
Asgn Oper Auth Status	FA I-SID/VLAN Assignment TLV authentication status detail data

Variable Definitions

The following table describes the parameters for the `show fa elements` command.

Variable	Value
<portlist>	Specifies a port or a list of ports for which to display discovered FA elements.
trunk <trunknumber>	Specifies a trunk number for which to display discovered FA elements.
auth-status {auth-pass auth-fail not-auth}	Displays only specified authorized status FA elements.
element-type {server proxy client}	Displays only specified element type.
client-type <6-17>	Displays only specified client type.

Displaying I-SID-to-VLAN assignment information

Use this procedure to display information about I-SID-to-VLAN assignments.

This procedure applies to ERS 3510 only.

Procedure

1. Log on to CLI to enter User EXEC mode.
2. To display I-SID-to-VLAN assignment information on an FA Proxy, enter the following commands:

```
show fa i-sid [<1-16777214>]
```

```
show i-sid [<1-16777214>]
```

OR

```
show fa assignment [<1-16777214>]
```

```
show i-sid [<1-16777214>]
```

Example

The following example displays sample output for the `show fa i-sid` command.

```
Switch(config)#show fa i-sid
```

I-SID	VLAN	Source	Status
500	5	Proxy	Active
501	25	Client	Active
600	6	Proxy, Client	Active
13849	138	Proxy	Rejected (VLAN invalid)
16000000	1000	Proxy	Rejected (application interaction issue)

Variable definitions

The following table describes the parameters for the `show fa i-sid [<1-16777214>]` or `show fa assignment [<1-16777214>]` command.

Variable	Value
<code>[<1-16777214>]</code>	Specifies the Fabric Attach I-SID for which to display I-SID-to-VLAN assignment information. Values range from 1 to 16777214. If you do not specify a I-SID value, the switch displays information for all configured I-SID-to-VLAN assignments.

Creating an I-SID-to-VLAN assignment on an FA proxy

About this task

Use this procedure to create an association between an I-SID and a VLAN on an FA Proxy, when SPBM is disabled on switch.

This procedure applies to ERS 3510 only.

Procedure

1. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

2. To create an I-SID-to-VLAN assignment, enter the following command:

```
i-sid <1-16777214> vlan <1-4094>
```

Result

Each FA Proxy I-SID-to-VLAN assignment creates a C-VLAN User Network Interface (UNI) when the assignment is active and accepted by an FA server.

Example

The following example creates an association between I-SID 600 and VLAN 3:

```
Switch(config)#i-sid 600 vlan 3
Switch(config)#
```

Variable definitions

The following table describes the parameters for the `i-sid <1-16777214> vlan <1-4094>` command

Variable	Value
<code>i-sid <1-16777214></code>	Specifies the I-SID to associate with the selected VLAN. Values range from 1 to 16777214.
<code>vlan <1-4094></code>	Specifies the VLAN to associate with the selected I-SID. Values range from 1 to 4094.

Deleting an I-SID-to-VLAN assignment on an FA Proxy

Use this procedure to remove the association between an I-SID and a VLAN on an FA Proxy.

This procedure applies to ERS 3510 only.

Procedure

1. Enter Global Configuration mode:


```
enable
configure terminal
```
2. To remove a specific I-SID-to-VLAN assignment, enter the following command:


```
no i-sid <I-SID> vlan <VLAN>
```
3. To remove all configured I-SID-to-VLAN assignments, enter the following command:


```
default i-sid
```

Variable definitions

The following table describes the parameters for the `no i-sid <I-SID> vlan <VLAN>` command

Variable	Value
i-sid <1-16777214>	Specifies the I-SID of the specific I-SID-to-VLAN assignment to remove. Values range from 1 to 16777214.
vlan <1-4094>	Specifies the VLAN of the specific I-SID-to-VLAN assignment to remove. Values range from 1 to 4094.

Configuring external client proxy support

Use this procedure to enable or disable external client proxy support.

About this task

This operation enables or disables external client proxy support.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. To enable external client proxy support, enter either of the following commands:

```
fa proxy
```

OR

```
default fa proxy
```

3. To disable external client proxy support, enter the following command:

```
no fa proxy
```

Configuring FA on switch ports

Use this procedure to enable or disable the FA operation on one or more switch ports.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. To configure the FA operation on switch ports, enter the following command:

```
[no][default] fa port-enable [<portlist>]
```

Variable definitions

The following table describes the parameters for the `[no][default] fa port-enable [<portlist>]` command.

Variable	Value
[<portlist>]	Enables the FA operation on the specified switch port or ports. If you do not specify a port, the FA operation is enabled on all switch ports.
[no]	Disables the FA operation on the specified switch port or ports. If you do not specify a port or ports, the FA operation is disabled on all switch ports.
[default]	Restores the FA operation on all switch ports to default.

Displaying switch port FA operation status

Use this procedure to display per-port FA operation status.

Procedure

1. Log on to CLI to enter User EXEC mode.
2. To display FA configuration information, enter one of the following commands:

```
show fa port-enable [<portlist> | enabled-port | disabled-port |
enabled-auth | disabled-auth]
```

OR

```
show fa interface [<portlist> | enabled-port | disabled-port |
enabled-auth | disabled-auth]
```

Example

The following example displays sample output for the `show fa port-enable` command.

```
Switch(config)#show fa port-enable
          Service
Unit Port IfIndex Trunk Advertisement Authentication Keymode
-----
1     1     1           Enabled Enabled Strict
1     2     2           Enabled Enabled Strict
1     3     3           Enabled Enabled Strict
1     4     4           2     Enabled Enabled Standard
1     5     5           2     Enabled Enabled Standard
1     6     6           Enabled Enabled Strict
```

Variable Definitions

The following table describes the parameters for the `show fa port-enable` or `show fa interface` command.

Variable	Value
<portlist>	Specifies a port or a list of ports for which to display FA operation status. If you do not specify a port or ports, the switch displays FA operation status for all switch ports.
enabled-port	Displays only FA enabled ports.
disabled-port	Displays only FA disabled ports.
enabled-auth	Displays only authentication enabled ports.
disabled-auth	Displays only authentication disabled ports.

Configuring the FA authentication key

Use the following command to configure the FA authentication key on specified ports.

 **Note:**

You can configure the FA authentication key only on secure images.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Configure the FA authentication key:

```
[default] fa authentication-key <portlist>
```

Enter the authentication key, and then re-enter the key for confirmation. For security purposes, key data is hidden.

Variable Definitions

The following table describes the parameters for the `fa authentication-key` command.

Variable	Value
<portlist>	Specifies a port or a list of ports for which to define the authentication key.

Configuring FA message authentication support

Use the following procedure to configure the FA message authentication support on specified ports.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Enable the FA message authentication support:

```
fa message-authentication [<PortList>] [key-mode <strict |
standard>]
```

3. **(Optional)** Reset the FA message authentication support to default:

```
default fa message-authentication
```

*** Note:**

The default setting is *enabled*.

4. **(Optional)** Disable the FA message authentication support:

```
no fa message-authentication [<PortList>]
```

Variable Definitions

The following table describes the parameters for the `fa message-authentication` command.

Variable	Value
<portlist>	Specifies a port or a list of ports for which to enable the FA message authentication support.
key-mode <strict standard>	Specifies the Authentication key usage setting — the user-defined authentication key (strict) or both the user-defined and default authentication keys (standard) are used for FA TLV data authentication. Default key-mode is strict.

Configuring FA VLANs

Use this procedure to create or delete FA VLANs on an FA Proxy or FA Standalone Proxy.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. To create FA VLANs, enter the following command:

```
fa vlan <LINE>
```

3. To delete FA VLANs, enter the following command:

```
no fa vlan <LINE>
```

4. To delete all configured FA VLANs, enter the following command:

```
default fa vlan
```

Example

The following is an example of creating an FA VLAN and verifying the configuration.

```
Switch(config)#fa vlan 6
Switch(config)#show fa vlan

VLAN          Source          Status
-----
6             Proxy          Pending

Binding Count: 1
```

Variable Definitions

The following table describes the parameters for the `fa vlan` command.

Variable	Value
[<LINE>]	Specifies an individual VLAN ID or a range of VLAN IDs to create. A VLAN ID can range from 1 to 4094.

Displaying Fabric Attach VLAN information

Use this procedure to display Fabric Attach-specific VLAN information.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. To display Fabric Attach VLAN information, enter the following command:

```
show fa vlan [<1-4094>]
```

Example

The following example displays sample output for the `show fa vlan` command.

```
Switch(config)#show fa vlan
```

VLAN	Source	Status
1007	Proxy	Pending
1008	Proxy	Pending

Enabling or disabling FA Zero Touch support

Procedure

1. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

2. To enable FA Zero Touch support on an FA Proxy, FA Server, or FA Standalone Proxy, enter the following command:

```
fa zero-touch
```

3. To disable FA Zero Touch support on an FA Proxy, FA Server, or FA Standalone Proxy, enter the following command:

```
no fa zero-touch
```

4. To reset the FA Zero Touch support state to default, enter the following command:

```
default fa zero-touch
```

Configuring FA Zero Touch options

Use this procedure to configure FA Zero Touch option settings..

Procedure

1. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

2. To enable an FA Zero Touch option, enter the following command:

```
fa zero-touch-options {{auto-port-mode-fa-client | auto-pvid-mode-fa-client | auto-trusted-mode-fa-client} [client-type {hint | <6-17>}} | ip-addr-dhcp}
```

*** Note:**

The `auto-port-mode-fa-client` option is incompatible with the `auto-pvid-mode-fa-client` option. You cannot enable both of these Zero Touch options for a client type at the same time.

- To disable a specific FA Zero Touch option, enter the following command:

```
no fa zero-touch-options {{auto-port-mode-fa-client | auto-pvid-
mode-fa-client | auto-trusted-mode-fa-client} | ip-addr-dhcp}
```

- To clear all FA Zero Touch option settings, enter the following command:

```
default fa zero-touch-options
```

Variable Definitions

The following table describes the parameters for the `fa zero-touch-options` command.

Variable	Value
<code>auto-port-mode-fa-client</code>	Automates the configuration of EAP port modes.
<code>auto-pvid-mode-fa-client</code>	Automates client PVID/Mgmt VLAN updates.
<code>auto-trusted-mode-fa-client</code>	Automates the FA Client connection default QoS treatment.
<code>ip-addr-dhcp</code>	Automates DHCP IP address acquisition.

*** Note:**

Default FA client types WAP Type 1 (6) and Switch (8) are associated with the client type-specific Zero Touch options if no client-type data is provided with the CLI commands.

Displaying FA Zero Touch option settings

Use this procedure to verify the FA Zero Touch option settings.

Procedure

- Enter Privileged EXEC mode:

```
enable
```

- To display the FA Zero Touch option settings, enter the following command:

```
show fa zero-touch-options [client-data]
```

Example

The following is an example of configuring and displaying FA Zero Touch options.

```
Switch(config)#fa zero-touch-options auto-port-mode-fa-client client-type 6,14-16
Switch(config)#show fa zero-touch-options
```

Fabric Attach Zero Touch Options:

```
ip-addr-dhcp
auto-port-mode-fa-client
```

The following is an example of displaying client data.

```
Switch(config)#show fa zero-touch-options client-data
```

Zero Touch Client Data

Type	Client Name	Applicable Zero Touch Options
6	wap-type1	auto-port-mode
7	wap-type2	
8	switch	
9	router	
10	phone	
11	camera	
12	video	
13	security-dev	
14	virtual-switch	auto-port-mode
15	srvr-endpt	auto-port-mode
16	ona-sdn	auto-port-mode
17	ona-spb-over-ip	

Type	Client Description	Origin
6	Wireless AP (Type 1)	Standard
7	Wireless AP (Type 2)	Standard
8	Switch	Standard
9	Router	Standard
10	IP Phone	Standard
11	IP Camera	Standard
12	IP Video	Standard
13	Security Device	Standard
14	Virtual Switch	Standard
15	Server Endpoint	Standard
16	ONA (SDN)	Standard
17	ONA (SpbOIp)	Standard

Zero Touch Client Data

```
Switch(config)#
```

Configuring FA Zero Touch Client

Use the following procedure to manipulate Fabric Attach Zero Touch Client (ZTC) specifications on a FA Proxy or FA Server.

*** Note:**

The `auto-client-attach` option must be enabled before Zero Touch Client specifications can be applied (either during discovery or retroactively).

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. To enable an FA Zero Touch Client, enter the following command:

```
fa zero-touch-client standard {camera | ona-sdn | ona-spb-over-ip |
phone | router | security-dev | srvr-endpt | switch | video |
virtual-switch | wap-type1 | wap-type2} vlan <VLAN> [i-sid <ISID>]
[priority <Priority>][keep-static]
```

3. To delete a specific FA Zero Touch Client, enter the following command:

```
no fa zero-touch-client standard <ClientName>
```

4. To clear all FA Zero Touch Client settings, enter the following command:

```
default fa zero-touch-client
```

Variable definitions

The following table describes the parameters for the `fa-zero-touch-client` command.

Variable	Value
standard	<p>Specifies the Standard (pre-defined) client type. The following client types are available:</p> <ul style="list-style-type: none"> • 6 - Wireless AP (Type 1) • 7 - Wireless AP (Type 2) • 8 - Switch • 9 - Router • 10 - IP Phone • 11 - IP Camera • 12 - IP Video • 13 - Security Device • 14 - Virtual Switch • 15 - Sever Endpoint • 16 - ONA (SDN)

Table continues...

Variable	Value
	• 17 - ONA (SpbOlp)
vlan ID <1–4094>	Specifies the VLAN ID.
ISID <0–16777214>	Specifies the Client I-SID for I-SID/VLAN binding generation.
priority <0–7>	Specifies the Client port priority.
keep-static	Specifies whether static VLANs should be kept or removed on the client port for the duration of the client connection.

Displaying FA Zero Touch Client

Use the following procedure to display Fabric Attach Zero Touch Client (ZTC) specifications on a FA Proxy or FA Server.

Procedure

1. Enter Privileged EXEC mode:
enable
2. Enter the following command:
show fa zero-touch-client

Example

The following example displays sample output for the show fa zero-touch-client.

```
Switch(config)#show fa zero-touch-client
Fabric Attach Zero Touch Client Auto-Attach Specifications
-----
Type          Client Name          VLAN I-SID      Priority  Static
-----
6      wap-type1          123  11111      NA      remove
11     camera            200  2000       5      remove
17     ona-spb-over-ip    4001 40001     7      keep
Zero Touch Client Auto-Attach Specification count: 3
Switch(config)#
```

Configuring FA Standalone Proxy mode

Use this procedure to enable or disable the FA Standalone Proxy mode on the switch.

Procedure

1. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

2. To enable FA Standalone Proxy mode, enter the following command:

```
fa standalone-proxy
```

3. To disable FA Standalone Proxy mode, enter the following command:

```
no fa standalone-proxy
```

4. To restore the FA Standalone Proxy mode to default, enter the following command:

```
default fa standalone-proxy
```

*** Note:**

FA Standalone Proxy mode is disabled by default on an FA Proxy.

*** Note:**

ERS 3500 supports FA Standalone Proxy mode operation only.

Displaying FA uplink values

Use this procedure to display FA static uplink values used in FA Standalone Proxy mode.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. To display FA static uplink values, enter the following command:

```
show fa uplink
```

Example

The following example displays sample output for the `show fa uplink` command.

```
Switch(config)#show fa uplink
Fabric Attach Static Uplinks:
  port - 0
  trunk - 8 (dynamic MLT [LAG admin key 300] - active)
```

Configuring the static uplink for FA Standalone Proxy mode

Use this procedure to specify a port or trunk to use as a static uplink associated with FA Standalone Proxy operation.

Procedure

1. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

2. To specify a port uplink or a trunk uplink to use in FA Standalone Proxy mode, enter the following command:

```
fa uplink {port <port> | trunk <trunkId>}
```

3. To clear static uplink data, enter the following command:

```
no fa uplink
```

Variable Definitions

The following table describes the parameters for the `fa uplink` command.

Variable	Value
<port>	Specifies the port to use as a static uplink.
<trunkId>	Specifies the trunk ID to use as a static uplink.

Configuring Fabric Attach extended-logging

Use the following procedure to configure Fabric Attach extended-logging.

Procedure

1. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

2. Enable Fabric Attach extended-logging:

```
fa extended-logging
```

3. Disable Fabric Attach extended-logging:

```
no fa extended-logging
```

Configuring the FA timeout

Procedure

1. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

2. To configure the FA timeout, enter the following command:

```
fa timeout <45-480>
```

3. To reset the timeout to its default value, enter the following command:

```
default fa timeout
```

Chapter 5: Fabric Attach configuration using Enterprise Device Manager

Use the procedures in this section to configure Fabric Attach (FA) using Enterprise Device Manager.

Configuring Fabric Attach

Use this procedure to configure Fabric Attach.

Procedure

1. From the navigation tree, select **Edit > Fabric Attach**.
2. Click the **Agent** tab.
3. To set the Auto Provision mode to FA Proxy, click **proxy** in the **AutoProvision** field.
4. To enable or disable FA Standalone Proxy mode, click **enable** or **disable** in the **StandaloneProxy** field.
5. To enable or disable external client proxy support, click **enable** or **disable** in the **ClientProxy** field.
6. Specify the port to use as a static uplink associated with FA Standalone Proxy operation in the **UplinkPort** field.
7. Specify the trunk to use as a static uplink associated with FA Standalone Proxy operation in the **UplinkTrunk** field.
8. Specify the agent timeout in the **Timeout** field.
9. To enable or disable extended logging, click **enable** or **disable** in the **ExtendedLogging** field.
10. To enable or disable Zero Touch support, click **enable** or **disable** in the **ZeroTouchService** field.
11. To enable Zero Touch options, select the appropriate checkbox in the **OptionFlags** field.
12. Click **Apply**.

Variable definitions

Use the data in the following table to use the **Agent** tab.

Variable	Value
Service	Displays the service status.
ElementType	Displays the element type.
ProvisionMode	Displays the provision mode status
AutoProvision	Displays the Auto Provision mode.
StandaloneProxy	Specifies whether FA Standalone Proxy mode is enabled or disabled. The default is disabled.
ClientProxy	Specifies whether external client proxy is enabled or disabled. The default is enabled.
UplinkPort	Specifies the port to use as a static uplink associated with FA Standalone Proxy operation.
UplinkTrunk	Specifies the trunk to use as a static uplink associated with FA Standalone Proxy operation.
Timeout	Specifies the agent timeout in seconds. The default value is 240 seconds.
ExtendedLogging	Specifies whether extended logging is enabled or disabled. The default is disabled.
ZeroTouchService	Specifies whether Zero Touch support is enabled or disabled. The default is enabled.
OptionFlags	Specifies the option flags for Zero Touch: <ul style="list-style-type: none"> • ipAddrDhcp— automates DHCP IP address acquisition. The default is enabled. • autoPortModeFaClient — automates the configuration of EAP port modes • autoTrustedModeFaClient— automates the FA Client connection default QoS treatment • autoPvidModeFaClient — automates client PVID/Mgmt VLAN updates

Configuring an I-SID/VLAN assignment

Use the following procedure to configure an I-SID/VLAN assignment on an FA Proxy.

This procedure applies to ERS 3510 only.

Procedure

1. In the navigation tree, expand the following folders: **Configuration > Edit**.
2. Click **Fabric Attach**.

3. In the work area, click the **I-SID** tab.
4. Click **Insert**.
5. Specify an I-SID in the **Isid** field.
6. Specify a VLAN in the **Vlan** field.
7. Click **Insert**.

Variable definitions

Use the data in the following table to use the **I-SID** tab.

Name	Description
Isid	Specifies the I-SID to associate with a VLAN.
Vlan	Specifies the VLAN to associate with an I-SID.
State	Indicates the state of the VLAN/I-SID assignment.
Source	Indicates the source of the VLAN/I-SID assignment.

Configuring per-port FA settings

Use the following procedure to enable or disable FA Signaling or to configure FA message authentication.

Procedure

1. From the navigation tree, select **Edit**.
2. In the Edit tree, double-click **Fabric Attach**.
3. On the work area, click the **Ports** tab.
4. To enable or disable the transmission of FA information in FA Signaling, select **enabled** or **disabled** in the **State** field for a specific port or ports.
5. To enable or disable message authentication, select **enabled** or **disabled** in the **MsgAuthStatus** field for a specific port or ports.
6. To configure the authentication key, enter an alphanumeric string of up to 32 characters in the **MsgAuthKey** field for a specific port or ports.
7. To configure the authentication key usage, select **strict** or **standard** in the **MsgAuthKeymode** field for a specific port or ports.
8. Click **Apply**.

Variable Definition

Variable	Value
IfIndex	Indicates the interface for which to configure FA operation and message authentication.
State	Enables or disables FA operation on the interface.
MsgAuthKey	Configures the authentication key for the specified interface.
MsgAuthStatus	Enables or disables FA message authentication on the interface.
MsgAuthKeymode	Specifies the Authentication key usage setting — the user-defined authentication key (strict) or both the user-defined and default authentication keys (standard) are used for FA TLV data authentication. Default key-mode is strict.

Displaying Fabric Attach elements

Use the following procedure to view discovered FA elements.

Procedure

1. In the navigation tree, expand the following folders: **Configuration>Edit**.
2. Click **Fabric Attach**.
3. In the work area, click the **Elements** tab.

Variable definitions

Use the data in the following table to use the **Elements** tab.

Name	Description
Ifindex	Indicates the interface through which the FA element was discovered.
Type	Indicates the FA element type.
Vlan	Indicates the management VLAN advertised by the FA element.
Id	Indicates the FA Element System ID, which is the unique system identifier used for connection management and limited device state distribution.

Table continues...

Name	Description
State	Indicates the state flag data associated with the discovered FA element.
Auth	Indicates the authentication status for the discovered element.
OperAuthStatus	Displays FA Element TLV authentication status detail data.
AsgnsAuth	Indicates FA I-SID/VLAN Assignment TLV authentication status.
AsgnsOperAuthStatus	Displays FA I-SID/VLAN Assignment TLV authentication status detail data.

Automating configurations for FA Clients

Use the following procedure to automate configurations for specific types of FA Clients.

Procedure

1. In the navigation tree, expand the following folders: **Configuration > Edit**.
2. Click **Fabric Attach**.
3. In the work area, click the **Zero Touch Client** tab.
4. To automate configurations for a specific FA Client type, double-click the corresponding **OptionFlags** field, select the appropriate check-box and click **Ok**.
5. Click **Apply**.

Variable definitions

Use the data in the following table to use the **Zero Touch Client** tab.

Name	Description
Type	Indicates the FA Client type ID.
Descr	Indicates the FA Client type.
OptionFlags	<p>Opens the OptionFlags dialog box to specify the automated configurations for an FA Client type.</p> <ul style="list-style-type: none"> • autoPortModeFaClient: Automates the configuration of EAP port modes. • autoTrustedModeFaClient: Automates the FA Client connection default QoS treatment. • autoPvidModeFaClient: Automates client PVID/Mgmt VLAN updates.

Table continues...

Name	Description
Disable all	Clears all options.
Select all	Selects all available options.
Ok	Confirms the selected options.
Close	Closes the OptionFlags dialog box.