# Fabric in a Box with External Fabric Edge



## Introduction to Fabric in a Box with External Fabric Edge

From Cisco IOS XE Amsterdam 17.2.1, the Fabric in a Box (FiaB) topology supports external fabric edge nodes. In a fabric-enabled wireless environment using FiaB (border node, control plane, fabric edge, and wireless controller in the same box), you can expand the network by adding external fabric edge nodes. The external fabric edge helps to increase the port density and extend the wireless reach by adding more APs. The APs and clients can exist on both the FiaB and the external fabric edge nodes. Also, the clients can roam between the APs on the FiaB and the external fabric edge nodes.

## Configuring a Fabric Profile (CLI)

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **configure terminal**<br>**Example:**<br>`Device# configure terminal` | Enters global configuration mode. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 2** | **wireless profile fabric** *fabric-profile-name*<br>**Example:**<br>`Device(config)# wireless profile fabric test-fabric-profile` | Configures the wireless fabric profile parameters. |
| **Step 3** | **client-l2-vnid** *client-l2-vnid*<br>**Example:**<br>`Device(config-wireless-fabric)# client-l2-vnid 8189` | Configures client L2-VNID.<br>Here, *client-l2-vnid* refers to the client L2-VNID value. The valid range is from 0 to 16777215. |
| **Step 4** | **description** *description*<br>**Example:**<br>`Device(config-wireless-fabric)# description test-fabric-profile` | Adds a description for the fabric profile. |
| **Step 5** | **end**<br>**Example:**<br>`Device(config-wireless-fabric)# end` | Returns to privileged EXEC mode. |

# Configuring a Policy Profile (CLI)

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **configure terminal**<br>**Example:**<br>`Device# configure terminal` | Enters global configuration mode. |
| **Step 2** | **wireless profile policy** *profile-policy*<br>**Example:**<br>`Device(config)# wireless profile policy test-policy-profile` | Configures wireless policy profile and enters wireless policy configuration mode.<br>**Note** In Fabric deployments, local mode, local authentication, and local association are not supported. |
| **Step 3** | **no central dhcp**<br>**Example:**<br>`Device(config-wireless-policy)# no central dhcp` | Configures local DHCP mode, where the DHCP is performed in an AP. |
| **Step 4** | **no central switching**<br>**Example:** | Configures a WLAN for local switching. |

| | Command or Action | Purpose |
|---|---|---|
| | `Device(config-wireless-policy)# no central switching` | |
| **Step 5** | **fabric** *fabric-name*<br>**Example:**<br>`Device(config-wireless-fabric)# fabric test-fabric-profile` | Applies the fabric profile. |
| **Step 6** | **no shutdown**<br>**Example:**<br>`Device(config-wireless-fabric)# no shutdown` | Enables the policy profile. |
| **Step 7** | **end**<br>**Example:**<br>`Device(config-wireless-fabric)# end` | Returns to privileged EXEC mode. |

# Configuring a Site Tag (CLI)

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **configure terminal**<br>**Example:**<br>`Device# configure terminal` | Enters the global configuration mode. |
| **Step 2** | **wireless tag site** *site-tag*<br>**Example:**<br>`Device(config)# wireless tag site default-site-tag-fabric` | Configures site tag and enters site tag configuration mode. |
| **Step 3** | **ap-profile** *ap-profile-name*<br>**Example:**<br>`Device(config-site-tag)# ap-profile default-ap-profile-fabric` | Assigns an AP profile to the wireless site. |
| **Step 4** | **description** *description*<br>**Example:**<br>`Device(config-site-tag)# description fabric-site` | Adds a description to the AP profile. |
| **Step 5** | **end**<br>**Example:**<br>`Device(config-site-tag)# end` | Returns to privileged EXEC mode. |

# Configuring a WLAN (CLI)

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **configure terminal**<br>**Example:**<br>`Device# configure terminal` | Enters global configuration mode. |
| **Step 2** | **wlan** *wlan-name wlan-id SSID-name*<br>**Example:**<br>`Device(config)# wlan test-wlan 1 test-wlan` | Configures a WLAN and enters WLAN configuration submode. |
| **Step 3** | **no shutdown**<br>**Example:**<br>`Device(config-wlan)# no shutdown` | Enables the WLAN. |

# Configuring a Policy Tag (CLI)

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **configure terminal**<br>**Example:**<br>`Device# configure terminal` | Enters global configuration mode. |
| **Step 2** | **wireless tag policy** *policy-tag-name*<br>**Example:**<br>`Device(config)# wireless tag policy test-policy-tag` | Configures policy tag and enters policy tag configuration mode. |
| **Step 3** | **wlan** *wlan-name* **policy** *profile-policy-name*<br>**Example:**<br>`Device(config-policy-tag)# wlan test-wlan policy test-policy-profile` | Maps a policy profile to a WLAN profile. |
| **Step 4** | **end**<br>**Example:**<br>`Device(config-site-tag)# end` | Returns to privileged EXEC mode. |

# Configuring an AP Profile

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **configure terminal**<br>**Example:**<br>`Device# configure terminal` | Enters the global configuration mode. |
| **Step 2** | **ap profile** *ap-profile-name*<br>**Example:**<br>`Device(config)# ap profile test-ap-profile` | Configures an AP profile and enters AP profile configuration mode. |
| **Step 3** | **ap** *ap-ether-mac*<br>**Example:**<br>`Device(config-ap-profile)# ap 006b.f126.036e` | Enters AP configuration mode. |
| **Step 4** | **policy-tag** *policy-tag*<br>**Example:**<br>`Device(config-ap-profile)# policy-tag test-policy-tag` | Specifies the policy tag that is to be attached to the AP. |
| **Step 5** | **end**<br>**Example:**<br>`Device(config-ap-profile)# end` | Returns to privileged EXEC mode. |

# Configuring Map Server and AP Subnet (CLI)

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **configure terminal**<br>**Example:**<br>`Device# configure terminal` | Enters global configuration mode. |
| **Step 2** | **wireless fabric**<br>**Example:**<br>`Device(config)# wireless fabric` | Enables SD-Access wireless globally. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 3** | **wireless fabric name** *name* **l2-vnid** *l2-vnid-value* **l3-vnid** *l3-vnid-value* **ip** *network-ip subnet-mask*<br>**Example:**<br>`Device(config)# wireless fabric name 40_40_0_0-INFRA_VN l2-vnid 8188 l3-vnid 4097 ip 40.40.0.0 255.255.0.0` | Configures AP subnet Layer 2 and Layer 3 VNIDs. |
| **Step 4** | **wireless fabric name** *name* **l2-vnid** *l2-vnid-value*<br>**Example:**<br>`Device(config)# wireless fabric name 41_41_0_0-DEFAULT_VN l2-vnid 8189` | Defines client Layer 2 VNID AAA override. |
| **Step 5** | **wireless fabric control-plane** *name*<br>**Example:**<br>`Device(config)# wireless fabric control-plane default-control-plane` | Configures the control plane name. |
| **Step 6** | **ip address** *ip-address* **key** *shared-key*<br>**Example:**<br>`Device((config-wireless-cp)# ip address 5.5.5.5 key 0 3a18df` | Configures the map server IP address and authentication key shared with the map server. |
| **Step 7** | **end**<br>**Example:**<br>`Device(config)# end` | Returns to privileged EXEC mode. Alternatively, you can also press **Ctrl-Z** to exit global configuration mode. |

# Configuring Fabric on FiaB Node

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **configure terminal**<br>**Example:**<br>`FiaB# configure terminal` | Enters global configuration mode. |
| **Step 2** | **router lisp**<br>**Example:**<br>`FiaB(config)# router lisp` | Enters LISP configuration mode. |
| **Step 3** | **locator-table default**<br>**Example:** | Associates a default Virtual Routing and Forwarding (VRF) table through which the routing locator address space is reachable to a |

| | Command or Action | Purpose |
|---|---|---|
| | `FiaB(config-router-lisp)# locator-table default` | router Locator ID Separation Protocol (LISP) instantiation. |
| **Step 4** | **locator-set** *locator-set-name*<br>**Example:**<br>`FiaB(config-router-lisp)# locator-set WLC` | Specifies a named locator set and enters LISP locator-set configuration mode. |
| **Step 5** | *ip-address*<br>**Example:**<br>`FiaB(config-router-lisp-locator-set)# 5.5.5.5` | Specifies an IP address of loopback or other egress tunnel router (ETR) interface. |
| **Step 6** | **exit-locator-set**<br>**Example:**<br>`FiaB(config-router-lisp-locator-set)# exit-locator-set` | Exits LISP locator-set configuration mode. |
| **Step 7** | **locator-set rloc_loopback**<br>**Example:**<br>`FiaB(config-router-lisp)# locator-set rloc_loopback` | Specifies an existing locator set and enters LISP locator-set configuration mode. |
| **Step 8** | **ipv4-interface** *interface*<br>**Example:**<br>`FiaB(config-router-lisp-locator-set)# IPv4-interface Loopback0` | Configures a locator address by creating a locator entry. |
| **Step 9** | **auto-discover-rlocs**<br>**Example:**<br>`FiaB(config-router-lisp-locator-set)# auto-discover-rlocs` | Configures the ETR to auto discover the locators registered by other xTRs. (Ingress tunnel router (ITR) and an ETR are known as an xTR.) |
| **Step 10** | **exit-locator-set**<br>**Example:**<br>`FiaB(config-router-lisp-locator-set)# exit-locator-set` | Exits LISP locator-set configuration mode. |
| **Step 11** | **service ipv4**<br>**Example:**<br>`FiaB(config-router-lisp)# service ipv4` | Enables Layer 3 network services for the IPv4 address family and enters service submode. |
| **Step 12** | **encapsulation vxlan**<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# encapsulation vxlan` | Configures VXLAN as encapsulation type for data packets. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 13** | **itr map-resolver** *map-resolver-address*<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# itr map-resolver 5.5.5.5` | Configures map resolver address for sending map requests. |
| **Step 14** | **etr map-server** *map-server-address* **key** *key-type authentication-key*<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# etr map-server 5.5.5.5 key 7 #########` | Configures the map server for ETR registration. |
| **Step 15** | **etr**<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# etr` | Configures a LISP ETR. |
| **Step 16** | **sgt**<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# sgt` | Enables security group tag propagation in LISP-encapsulated traffic. |
| **Step 17** | **no map-cache away-eids send-map-request**<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# no map-cache away-eids send-map-request` | Removes the address family-specific map cache configuration. |
| **Step 18** | **proxy-itr** *ip-address*<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# proxy-itr 5.5.5.5` | Enables the Proxy Ingress Tunnel Router (PITR) functionality and specifies the address to use when LISP encapsulating packets to LISP sites. |
| **Step 19** | **map-server**<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# map-server` | Configures a LISP map server. |
| **Step 20** | **map-resolver**<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# map-resolver` | Configures a LISP map resolver. |
| **Step 21** | **map-cache away-eids send-map-request**<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# map-cache 40.40.0.0/16 send-map-request` | Exports table entries into the map cache, with the action set to send-map-request. |
| **Step 22** | **route-export site-registrations**<br>**Example:** | Exports LISP site registrations to the routing information base (RIB). |

| | Command or Action | Purpose |
|---|---|---|
| | `FiaB(config-lisp-srv-ipv4)# route-export site-registrations` | |
| **Step 23** | **distance site-registrations** *num*<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# distance site-registrations 250` | Configures LISP installed routes of type site registrations. |
| **Step 24** | **map-cache site-registration**<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# map-cache site-registration` | Installs the map cache to a map request for site registrations. |
| **Step 25** | **exit-service-ipv4**<br>**Example:**<br>`FiaB(config-lisp-srv-ipv4)# exit-service-ipv4` | Exits LISP service-ipv4 configuration mode. |
| **Step 26** | **service ethernet**<br>**Example:**<br>`FiaB(config-router-lisp)# service ethernet` | Selects service type as Ethernet and enters service submode. |
| **Step 27** | **database-mapping limit dynamic** *limit*<br>**Example:**<br>`FiaB(config-lisp-srv-eth)# database-mapping limit dynamic 5000` | Configures the maximum number of dynamic local endpoint identifier (EID) prefix database entries. |
| **Step 28** | **itr map-resolver** *map-resolver-address*<br>**Example:**<br>`FiaB(config-lisp-srv-eth)# itr map-resolver 5.5.5.5` | Configures the map-resolver address for sending map requests. |
| **Step 29** | **itr**<br>**Example:**<br>`FiaB(config-lisp-srv-eth)# itr` | Enables the LISP ITR functionality. |
| **Step 30** | **etr map-server** *map-server-address* **key** *key-type authentication-key*<br>**Example:**<br>`FiaB(config-lisp-srv-eth)# etr map-server 5.5.5.5 key 7 1234` | Configures a map server for ETR registration. |
| **Step 31** | **etr**<br>**Example:**<br>`FiaB(config-lisp-srv-eth)# etr` | Enables the LISP ETR functionality. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 32** | **map-server**<br>**Example:**<br>`FiaB(config-lisp-srv-eth)# map-server` | Enables the LISP map server functionality. |
| **Step 33** | **map-resolver**<br>**Example:**<br>`FiaB(config-lisp-srv-eth)# map-resolver` | Enables the LISP map resolver functionality. |
| **Step 34** | **exit-service-ethernet**<br>**Example:**<br>`FiaB(config-lisp-srv-eth)# exit-service-ethernet` | Exits LISP service-ethernet configuration mode. |
| **Step 35** | **instance-id** *instance*<br>**Example:**<br>`FiaB(config-router-lisp)# instance-id 101` | Creates a LISP EID instance to group multiple services. |
| **Step 36** | **remote-rloc-probe on-route-change**<br>**Example:**<br>`FiaB(config-lisp-inst)# remote-rloc-probe on-route-change` | Configures the parameters for probing of remote routing locators (RLOCs). |
| **Step 37** | **dynamic-eid** *dynamic-eid-name*<br>**Example:**<br>`FiaB(config-lisp-inst)# dynamic-eid 40_40_0_0-INFRA_VN-IPV4` | Configures a dynamic EID and enters dynamic EID configuration mode. |
| **Step 38** | **database-mapping** *eid* **locator-set rloc_loopback**<br>**Example:**<br>`FiaB(config-router-lisp-dynamic-eid)# database-mapping 40.40.0.0/16 locator-set rloc_loopback` | Configures EID prefix and locator-set for dynamic EID. |
| **Step 39** | **exit-dynamic-id**<br>**Example:**<br>`FiaB(config-router-lisp-dynamic-eid)# exit-dynamic-eid` | Exits LISP dynamic-eid configuration mode. |
| **Step 40** | **exit-instance-id**<br>**Example:**<br>`FiaB(config-router-lisp-instance)# exit-instance-id` | Exits LISP instance-id configuration mode. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 41** | **instance-id** *instance*<br>**Example:**<br>`FiaB(config-router-lisp)# instance-id 101` | Creates a LISP EID instance to group multiple services. |
| **Step 42** | **remote-rloc-probe on-route-change**<br>**Example:**<br>`FiaB(config-lisp-inst)# remote-rloc-probe on-route-change` | Configures parameters for probing remote RLOCs. |
| **Step 43** | **service ethernet**<br>**Example:**<br>`FiaB(config-lisp-inst)# service ethernet` | Enables Layer 2 network services and enters service submode. |
| **Step 44** | **eid-table vlan** *vlan-number*<br>**Example:**<br>`FiaB(config-lisp-inst-srv-eth)# eid-table vlan 101` | Binds an EID table to VLAN. |
| **Step 45** | **database-mapping mac locator-set rloc_loopbac**<br>**Example:**<br>`FiaB(config-lisp-inst-srv-eth)# database-mapping mac locator-set rloc_loopbac` | Configures an address family-specific local EID prefixes database. |
| **Step 46** | **exit-service-ethernet**<br>**Example:**<br>`FiaB(config-lisp-inst-srv-eth)# exit-service-ethernet` | Exits LISP service-ethernet configuration mode. |
| **Step 47** | **exit-instance-id**<br>**Example:**<br>`FiaB(config-lisp-inst)# exit-instance-id` | Exits LISP instance-id configuration mode. |
| **Step 48** | **map-server session passive-open** *server*<br>**Example:**<br>`FiaB(config-router-lisp)# map-server session passive-open WLC` | Configures a map server with open passive TCP sockets to listen for incoming connections. |
| **Step 49** | **site** *site-name*<br>**Example:**<br>`FiaB(config-router-lisp)# site site_uci` | Configures a LISP site on a map server. |
| **Step 50** | **description** *map-server-description*<br>**Example:** | Specifies a description text for the LISP site. |

| | Command or Action | Purpose |
|---|---|---|
| | `FiaB(config-router-lisp-site)# description map-server configured from Cisco DNA-Center` | |
| **Step 51** | **authentication-key** *key*<br>**Example:**<br>`FiaB(config-router-lisp-site)# authentication-key 7 ########` | Configures the authentication key used by the LISP site. |
| **Step 52** | **eid-record instance-id** *instance-id address* **accept-more-specifics**<br>**Example:**<br>`FiaB(config-router-lisp-site)# eid-record instance-id 4097 0.0.0.0/0 accept-more-specifics` | Specifies that any EID prefix that is more specific than the EID prefix configured is accepted and tracked. |
| **Step 53** | **eid-record instance-id** *instance-id* **any-mac**<br>**Example:**<br>`FiaB(config-router-lisp-site)# eid-record instance-id 8188 any-mac` | Accepts registrations, if any, for Layer 2 EID records. |
| **Step 54** | **exit-site**<br>**Example:**<br>`FiaB(config-router-lisp-site)# exit-site` | Exits LISP site configuration mode. |
| **Step 55** | **ipv4 locator reachability exclude-default**<br>**Example:**<br>`FiaB(config-router-lisp)# ipv4 locator reachability exclude-default` | Configures the IPv4 locator address of the LISP. |
| **Step 56** | **ipv4 source-locator** *interface-name*<br>**Example:**<br>`FiaB(config-router-lisp)# ipv4 source-locator Loopback0` | Configures the IPv4 source locator address of the interface. |
| **Step 57** | **exit-router-lisp**<br>**Example:**<br>`FiaB(config-router-lisp)# exit-router-lisp` | Exits LISP router-lisp configuration mode. |

# Configuring a Fabric Edge Node

**Note** You can perform the following configuration tasks only from Fabric Edge Node, and not from your controller.

### Procedure

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **configure terminal**<br>**Example:**<br>`FabricEdge# configure terminal` | Enters global configuration mode. |
| **Step 2** | **router lisp**<br>**Example:**<br>`FabricEdge(config)# router lisp` | Enters LISP configuration mode. |
| **Step 3** | **locator-table default**<br>**Example:**<br>`FabricEdge(config-router-lisp)# locator-table default` | Associates a default VRF table through which the routing locator address space is reachable to a router LISP instantiation. |
| **Step 4** | **locator-set rloc_loopback**<br>**Example:**<br>`FabricEdge(config-router-lisp)# locator-set rloc_loopback` | Specifies a named locator set and enters LISP locator-set configuration mode. |
| **Step 5** | **ipv4-interface** *interface-num* **priority** *priority* **weight** *weight*<br>**Example:**<br>`FabricEdge(config-router-lisp-locator-set)# IPv4-interface Loopback 0 priority 10 weight 10` | Configures the IPv4 address of the interface as locator. |
| **Step 6** | **exit-locator-set**<br>**Example:**<br>`FabricEdge(config-router-lisp-locator-set)# exit-locator-set` | Exits LISP locator-set configuration mode. |
| **Step 7** | **exit-router-lisp**<br>**Example:**<br>`FabricEdge(config-router-lisp-)# exit-router-lisp` | Exits LISP router-lisp configuration mode. |
| **Step 8** | **interface vlan** *interface-num*<br>**Example:**<br>`FabricEdge(config)# interface Vlan 2045` | Configures an interface. |
| **Step 9** | **description** *description*<br>**Example:**<br>`FabricEdge(config-if)# description Configured from Cisco DNA-Center` | Specifies a description text for the interface. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 10** | **mac-address** *mac-address*<br>**Example:**<br>`FabricEdge(config-if)# mac-address 0000.0c9f.f85c` | Sets an interface MAC address manually. |
| **Step 11** | **ip address** *ip-address mask*<br>**Example:**<br>`FabricEdge(config-if)# ip address 192.168.1.1 255.255.255.252` | Configures an IP address for the interface. |
| **Step 12** | **ip helper-address** *ip-address*<br>**Example:**<br>`FabricEdge(config-if)# ip helper-address 9.9.9.9` | Specifies a destination address for UDP broadcasts. |
| **Step 13** | **no ip redirects**<br>**Example:**<br>`FabricEdge(config-if)# no ip redirects` | Disables sending of ICMP redirect messages. |
| **Step 14** | **ip route-cache same-interface**<br>**Example:**<br>`FabricEdge(config-if)# ip route-cache same-interface` | Enables fast-switching cache for outgoing packets on the same interface. |
| **Step 15** | **no lisp mobility liveness test**<br>**Example:**<br>`FabricEdge(config-if)# no lisp mobility liveness test` | Removes liveness test on dynamic EID discovered on this interface. |
| **Step 16** | **lisp mobility** *dynamic-eid-name*<br>**Example:**<br>`FabricEdge(config-if)# lisp mobility 40_40_0_0-INFRA_VN-IPV4` | Allows EID mobility on the interface. |
| **Step 17** | **exit**<br>**Example:**<br>`FabricEdge(config-if)# exit` | Exits from interface configuration mode. |
| **Step 18** | **router lisp**<br>**Example:**<br>`FabricEdge(config)# router lisp` | Enters LISP configuration mode. |
| **Step 19** | **locator-set** *locator-set-name*<br>**Example:**<br>`FabricEdge(config-router-lisp)# locator-set rloc_824ecb7` | Specifies a locator set and enters LISP locator-set configuration mode. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 20** | **exit-locator-set**<br>**Example:**<br>`FabricEdge(config-router-lisp-locator-set)# exit-locator-set` | Exits LISP locator-set configuration mode. |
| **Step 21** | **service ipv4**<br>**Example:**<br>`FabricEdge(config-router-lisp)# service ipv4` | Enables Layer 3 network services for the IPv4 address family and enters service submode. |
| **Step 22** | **use-petr** *ip-address*<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# use-petr 5.5.5.5` | Configures the loopback IP address of the Proxy Egress Tunnel Router (PETR). |
| **Step 23** | **encapsulation vxlan**<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# encapsulation vxlan` | Selects the encapsulation type as VXLAN for data packets. |
| **Step 24** | **itr map-resolver** *map-resolver-address*<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# itr map-resolver 5.5.5.5` | Configures the map resolver address for sending map requests. |
| **Step 25** | **etr map-server** *map-server-address* **key** *key-type authentication-key*<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# etr map-server 5.5.5.5 key 7 #########` | Configures the map server for ETR registration. |
| **Step 26** | **etr map-server** *map-server-address* **proxy-reply** *authentication-key*<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# etr map-server 5.5.5.5 proxy-reply` | Configures the locator address of the LISP map server and the authentication key that this router, acting as a LISP ETR, will use to register with the LISP mapping system. |
| **Step 27** | **etr**<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# etr` | Configures a LISP Egress Tunnel Router (ETR). |
| **Step 28** | **sgt**<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# sgt` | Enable security group tag propagation in LISP encapsulated traffic. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 29** | **no map-cache away-eids send-map-request**<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# no map-cache away-eids send-map-request` | Removes the address family-specific map cache configuration. |
| **Step 30** | **proxy-itr** *ip-address*<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# proxy-itr 5.5.5.5` | Enables the Proxy Ingress Tunnel Router (PITR) functionality and specifies the address to use when LISP encapsulating packets to LISP sites. |
| **Step 31** | **exit-service-ipv4**<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# exit-service-ipv4` | Exits LISP service-ipv4 configuration mode. |
| **Step 32** | **service ethernet**<br>**Example:**<br>`FabricEdge(config-router-lisp)# service ethernet` | Selects the service type as Ethernet. |
| **Step 33** | **itr map-resolver** *map-resolver-address*<br>**Example:**<br>`FabricEdge(config-lisp-srv-eth)# itr map-resolver 5.5.5.5` | Configures the map-resolver address for sending map requests. |
| **Step 34** | **itr**<br>**Example:**<br>`FabricEdge(config-lisp-srv-eth)# itr` | Enables the LISP ITR functionality. |
| **Step 35** | **etr map-server** *map-server-address* **key** *key-type authentication-key*<br>**Example:**<br>`FabricEdge(config-lisp-srv-eth)# etr map-server 5.5.5.5 key 7 1234` | Configures the map server for ETR registration. |
| **Step 36** | **etr**<br>**Example:**<br>`FabricEdge(config-lisp-srv-eth)# etr` | Enables the LISP ETR functionality. |
| **Step 37** | **exit-service-ethernet**<br>**Example:**<br>`FabricEdge(config-lisp-srv-eth)# exit-service-ethernet` | Exits LISP service-ethernet configuration mode. |
| **Step 38** | **instance-id** *instance*<br>**Example:** | Creates a LISP EID instance to group multiple services. |

| | Command or Action | Purpose |
|---|---|---|
| | `FabricEdge(config-router-lisp)# instance-id 101` | |
| **Step 39** | **remote-rloc-probe on-route-change**<br>**Example:**<br>`FabricEdge(config-lisp-inst)# remote-rloc-probe on-route-change` | Configures the parameters for probing remote Routing locators (RLOCs). |
| **Step 40** | **dynamic-eid** *dynamic-eid-name*<br>**Example:**<br>`FabricEdge(config-lisp-inst)# dynamic-eid 40_40_0_0-INFRA_VN-IPV4` | Configures a dynamic EID and enters dynamic EID configuration mode. |
| **Step 41** | **database-mapping** *eid* **locator-set rloc_loopback**<br>**Example:**<br>`FabricEdge(config-router-lisp-dynamic-eid)# database-mapping 40.40.0.0/16 locator-set rloc_loopback` | Configures the EID prefix and locator set for the dynamic EID. |
| **Step 42** | **exit-dynamic-id**<br>**Example:**<br>`FabricEdge(config-router-lisp-dynamic-eid)# exit-instance-id` | Exits dynamic instance submode. |
| **Step 43** | **service ipv4**<br>**Example:**<br>`FabricEdge(config-lisp-inst)# service ipv4` | Selects service type as IPv4. |
| **Step 44** | **eid-table default**<br>**Example:**<br>`FabricEdge(config-lisp-inst-srv-ipv4)# eid-table default` | Binds an EID table. |
| **Step 45** | **exit-service-ipv4**<br>**Example:**<br>`FabricEdge(config-lisp-inst-srv-ipv4)# exit-service-ipv4` | Exits LISP service-ipv4 configuration mode. |
| **Step 46** | **exit-instance-id**<br>**Example:**<br>`FabricEdge(config-lisp-inst)# exit-instance-id` | Exits LISP instance-id configuration mode. |
| **Step 47** | **service ipv4**<br>**Example:** | Selects service type as IPv4. |

| | Command or Action | Purpose |
|---|---|---|
| | `FabricEdge(config-router-lisp)# service ipv4` | |
| **Step 48** | **map-cache away-eids map-request**<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# map-cache 40.40.0.0/16 map-request` | Exports away table entries into the map cache, with the action set to send-map-request. |
| **Step 49** | **exit-service-ipv4**<br>**Example:**<br>`FabricEdge(config-lisp-srv-ipv4)# exit-service-ipv4` | Exits LISP service-ipv4 configuration mode. |
| **Step 50** | **instance-id** *instance*<br>**Example:**<br>`FabricEdge(config-router-lisp)# instance-id 8188` | Creates a LISP EID instance to group multiple services. |
| **Step 51** | **remote-rloc-probe on-route-change**<br>**Example:**<br>`FabricEdge(config-lisp-inst)# remote-rloc-probe on-route-change` | Configures parameters for probing remote RLOCs. |
| **Step 52** | **service ethernet**<br>**Example:**<br>`FabricEdge(config-lisp-inst)# service ethernet` | Enables Layer 2 network services and enters service submode. |
| **Step 53** | **eid-table vlan** *vlan-number*<br>**Example:**<br>`FabricEdge(config-lisp-inst-srv-eth)# eid-table vlan 101` | Binds an EID table to VLAN. |
| **Step 54** | **database-mapping maclocator-set rloc_loopbac**<br>**Example:**<br>`FabricEdge(config-lisp-inst-srv-eth)# database-mapping mac locator-set rloc_loopbac` | Configures address family-specific local EID prefixes database. |
| **Step 55** | **exit-service-ethernet**<br>**Example:**<br>`FabricEdge(config-lisp-inst-srv-eth)# exit-service-ethernet` | Exits LISP service-ethernet configuration mode. |
| **Step 56** | **exit-instance-id**<br>**Example:** | Exits from LISP instance-id configuration mode. |

| | Command or Action | Purpose |
|---|---|---|
| | `FabricEdge(config-lisp-inst)# exit-instance-id` | |
| **Step 57** | **ipv4 locator reachability minimum-mask-length** *length*<br>**Example:**<br>`FabricEdge(config-router-lisp)# ipv4 locator reachability minimum-mask-length 32` | Configures the IPv4 locator address of the LISP. |
| **Step 58** | **ipv4 source-locator** *interface-name*<br>**Example:**<br>`FabricEdge(config-router-lisp)# ipv4 source-locator Loopback0` | Configures the IPv4 source locator address of the interface. |
| **Step 59** | **exit-router-lisp**<br>**Example:**<br>`FabricEdge(config-router-lisp)# exit-router-lisp` | Exits LISP router-lisp configuration mode. |

# Verifying Fabric Configuration

Use the following commands to verify the fabric configuration.

To verify the LISP configuration on a device, use the following command:

```
FabricEdge# show running-config | section router lisp

router lisp
 locator-table default
 locator-set default
  exit-locator-set
 !
 locator-set rloc_loopback
  IPv4-interface Loopback0 priority 10 weight 10
  exit-locator-set
 !
 locator default-set rloc_loopback
 service ipv4
  encapsulation vxlan
  itr map-resolver 21.21.21.21
  itr
  etr map-server 21.21.21.21 key tasman
  etr map-server 21.21.21.21 proxy-reply
  etr
  use-petr 21.21.21.21 priority 1 weight 100
  exit-service-ipv4
 !
 service ethernet
  itr map-resolver 5.5.5.5
  itr map-resolver 21.21.21.21
  itr
  etr map-server 21.21.21.21 key tasman
  etr map-server 21.21.21.21 proxy-reply
```

```
 etr
 exit-service-ethernet
!
instance-id 0
 loc-reach-algorithm lsb-reports ignore
 dynamic-eid eid_10_56_25
  database-mapping 10.56.25.0/24 locator-set rloc_loopback
  exit-dynamic-eid
 !
 service ipv4
  eid-table default
  database-mapping 26.26.26.26/32 locator-set rloc_loopback
  exit-service-ipv4
 !
 exit-instance-id
!
instance-id 1
 service ethernet
  eid-table vlan 25
  flood arp-nd
  database-mapping mac locator-set rloc_loopback
  exit-service-ethernet
 !
 exit-instance-id
!
instance-id 101
 service ipv4
  exit-service-ipv4
 !
 exit-instance-id
!
instance-id 8188
 exit-instance-id
!
loc-reach-algorithm lsb-reports ignore
exit-router-lisp
```

To verify the operational status of LISP as configured on a device, use the following command:

```
FabricEdge# show ip lisp

Information applicable to all EID instances:
  Router-lisp ID:                         0
  Locator table:                          default
  Ingress Tunnel Router (ITR):            enabled
  Egress Tunnel Router (ETR):             enabled
  Proxy-ITR Router (PITR):                disabled
  Proxy-ETR Router (PETR):                disabled
  NAT-traversal Router (NAT-RTR):         disabled
  Mobility First-Hop Router:              disabled
  Map Server (MS):                        disabled
  Map Resolver (MR):                      disabled
  Mr-use-petr:                            disabled
  Delegated Database Tree (DDT):          disabled
  Publication-Subscription:               enabled
    Publisher(s):                         *** NOT FOUND ***
  ITR Map-Resolver(s):                    21.21.21.21
  ETR Map-Server(s):                      21.21.21.21
  xTR-ID:                                 0xD89893A6-0x98749B2C-0x89810431-0x92F33C9C
  site-ID:                                unspecified
  ITR local RLOC (last resort):           *** NOT FOUND ***
  ITR use proxy ETR RLOC(Encap IID):      21.21.21.21
  ITR Solicit Map Request (SMR):          accept and process
    Max SMRs per map-cache entry:         8 more specifics
```

```
    Multiple SMR suppression time:          20 secs
  ETR accept mapping data:                  disabled, verify disabled
  ETR map-cache TTL:                        1d00h
  Locator Status Algorithms:
    RLOC-probe algorithm:                   disabled
    RLOC-probe on route change:             N/A (periodic probing disabled)
    RLOC-probe on member change:            disabled
    LSB reports:                            ignore
    IPv4 RLOC minimum mask length:          /0
    IPv6 RLOC minimum mask length:          /0
  Map-cache:
    Map-cache limit:                        32768
    Map-cache activity check period:        60 secs
    Persistent map-cache:                   disabled
  Source locator configuration:
    GigabitEthernet1/0/1: 24.24.24.24 (Loopback0)
    Vlan25: 24.24.24.24 (Loopback0)
  Database:
    Dynamic database mapping limit:         25000
```

To verify the operational status of the map cache on a device configured as an ITR or PITR, use the following command:

```
FabricEdge# show lisp instance-id iid ipv4 map-cache

LISP IPv4 Mapping Cache for EID-table default (IID 0), 5 entries

0.0.0.0/0, uptime: 2w5d, expires: never, via static-send-map-request
  Encapsulating to proxy ETR

10.56.25.0/24, uptime: 2w0d, expires: never, via dynamic-EID, send-map-request
  Encapsulating to proxy ETR

10.56.25.25/32, uptime: 2w5d, expires: 23:10:06, via map-reply, complete
  Locator      Uptime    State  Pri/Wgt     Encap-IID
  21.21.21.21  2w5d      up       0/0         -

22.0.0.0/8, uptime: 2w5d, expires: 00:04:54, via map-reply, forward-native
  Encapsulating to proxy ETR

26.26.26.26/32, uptime: 09:48:33, expires: 14:11:26, via map-reply, self, complete
  Locator      Uptime    State     Pri/Wgt     Encap-IID
  24.24.24.24  09:48:33  up, self   50/50        -
```

To verify the operational status of the database mapping on a device configured as an ETR, use the following command:

```
FabricEdge# show lisp instance-id iid ipv4 database

LISP ETR IPv4 Mapping Database for EID-table default (IID 0), LSBs: 0x1
Entries total 3, no-route 0, inactive 0

10.56.25.27/32, dynamic-eid eid_10_56_25, skip reg, inherited from default locator-set
rloc_loopback
  Uptime: 00:25:11, Last-change: 00:25:11
  Domain-ID: unset
  Locator      Pri/Wgt  Source     State
  24.24.24.24   10/10   cfg-intf   site-self, reachable

10.56.25.67/32, dynamic-eid eid_10_56_25, inherited from default locator-set rloc_loopback
  Uptime: 00:24:47, Last-change: 00:24:47
  Domain-ID: unset
  Locator      Pri/Wgt  Source     State
```

```
  24.24.24.24   10/10   cfg-intf   site-self, reachable

26.26.26.26/32, locator-set rloc_loopback
  Uptime: 2w5d, Last-change: 00:50:36
  Domain-ID: unset
  Locator      Pri/Wgt  Source     State
  24.24.24.24   10/10   cfg-intf   site-self, reachable
```

To verify the configured LISP sites on a LISP map server, use the following command:

```
FabricEdge# show lisp instance-id iid ipv4 server

LISP Site Registration Information
* = Some locators are down or unreachable
# = Some registrations are sourced by reliable transport

Site Name      Last      Up     Who Last             Inst     EID Prefix
               Register         Registered           ID
eca            never     no     --                   0        10.56.25.0/24
               04:52:53  yes#   21.21.21.21:40875    0        10.56.25.25/32
               04:07:09  yes#   27.27.27.27:24949    0        10.56.25.64/32
               03:21:16  yes#   24.24.24.24:23672    0        10.56.25.67/32
               04:52:53  yes#   21.21.21.21:40875    0        23.23.23.23/32
               03:47:04  yes#   24.24.24.24:23672    0        26.26.26.26/32
               2w0d      yes#   27.27.27.27:24949    0        29.29.29.29/32
site_uci       never     no     --                   4097     0.0.0.0/0
```

To verify the operational status of LISP sites, use the following command in FiaB node:

```
FabricEdge# show lisp instance-id 1 ethernet server

================================================
Output for router lisp 0 instance-id 1
================================================
LISP Site Registration Information


================================================
Output for router lisp 0 instance-id 1
================================================
LISP Site Registration Information
* = Some locators are down or unreachable
# = Some registrations are sourced by reliable transport

Site Name      Last      Up     Who Last             Inst     EID Prefix
               Register         Registered           ID
eca            never     no     --                   1        any-mac
               04:10:37  yes#   27.27.27.27:24949    1        00b0.e19c.2578/48
               04:09:20  yes#   22.22.22.22:64083    1        00b0.e19c.fc40/48
               03:24:52  yes#   24.24.24.24:23672    1        dcce.c130.0b70/48
               03:23:39  yes#   22.22.22.22:64083    1        dcce.c130.9820/48
```

To verify the operational status of LISP sites, use the following command in FiaB node:

```
FabricEdge# show lisp instance-id 0 ipv4 server

LISP Site Registration Information
* = Some locators are down or unreachable
# = Some registrations are sourced by reliable transport

Site Name      Last      Up     Who Last             Inst     EID Prefix
               Register         Registered           ID
```

```
eca             never     no     --                   0        10.56.25.0/24
                6d18h     yes#   21.21.21.21:40875    0        10.56.25.25/32
                01:23:56  yes#   27.27.27.27:24949    0        10.56.25.64/32
                00:24:40  yes#   24.24.24.24:23672    0        10.56.25.72/32
                6d18h     yes#   21.21.21.21:40875    0        23.23.23.23/32
                6d17h     yes#   24.24.24.24:23672    0        26.26.26.26/32
                3w0d      yes#   27.27.27.27:24949    0        29.29.29.29/32
```

To verify the operational status of LISP sites on IPv4 database, use the following command in fabric edge node:

```
FabricEdge# show lisp instance-id 0 ipv4 database

LISP ETR IPv4 Mapping Database for EID-table default (IID 0), LSBs: 0x1
Entries total 3, no-route 0, inactive 0

10.56.25.27/32, dynamic-eid eid_10_56_25, skip reg, inherited from default locator-set
rloc_loopback
  Uptime: 00:25:54, Last-change: 00:25:54
  Domain-ID: unset
  Locator      Pri/Wgt  Source     State
  24.24.24.24   10/10   cfg-intf   site-self, reachable
10.56.25.72/32, dynamic-eid eid_10_56_25, inherited from default locator-set rloc_loopback
 Uptime: 00:25:25, Last-change: 00:25:25
  Domain-ID: unset
  Locator      Pri/Wgt  Source     State
  24.24.24.24   10/10   cfg-intf   site-self, reachable
26.26.26.26/32, locator-set rloc_loopback
  Uptime: 3w5d, Last-change: 6d17h
  Domain-ID: unset
  Locator      Pri/Wgt  Source     State
  24.24.24.24   10/10   cfg-intf   site-self, reachable
```

To verify the operational status of LISP sites on mac mapping database, use the following command on the FE node:

```
FabricEdge# show lisp instance-id 1 ethernet database

LISP ETR MAC Mapping Database for EID-table Vlan 25 (IID 1), LSBs: 0x1
Entries total 2, no-route 0, inactive 0

cc98.911b.73f1/48, dynamic-eid Auto-L2-group-1, skip reg, inherited from default locator-set
 rloc_loopback
  Uptime: 00:00:49, Last-change: 00:00:49
  Domain-ID: unset
  Locator      Pri/Wgt  Source     State
  24.24.24.24   10/10   cfg-intf   site-self, reachable
dcce.c130.0b70/48, dynamic-eid Auto-L2-group-1, inherited from default locator-set
rloc_loopback
  Uptime: 00:00:50, Last-change: 00:00:50
  Domain-ID: unset
  Locator      Pri/Wgt  Source     State
  24.24.24.24   10/10   cfg-intf   site-self, reachable
```