CFM on EVPN

This chapter describes CFM on EVPN.

CFM on EVPN

Table 1: Feature History Table

Feature Name	Release Information	Feature Description
CFM on EVPN	Release 24.2.11	You can now proactively monitor connectivity and verify faults and isolate them for EVPN services. This is because Ethernet Connectivity Fault Management (CFM) is now available for EVPN and provides end-to-end service level OAM (Operations, Administration, and Maintenance) for EVPN services. This feature is supported only on routers with Q200 and P100 based line cards..

Ethernet Connectivity Fault Management (CFM) is an end-to-end per-service-instance Ethernet layer operation, administration, and management (OAM) protocol. It includes proactive connectivity monitoring, fault verification, and fault isolation for large networks.

For more information about Ethernet CFM, refer to the *Configuring Ethernet OAM* chapter in the *Interface and Hardware Component Configuration Guide for Cisco 8000 Series Routers*.

The CFM is now available for EVPN and provides end-to-end service level OAM (Operations, Administration, and Maintenance) for EVPN services. You can monitor the connections between the nodes using CFM in an EVPN network.

CFM is supported on EVPN network running with the following services.

- CFM on EVPN E-LAN Single-Homing: CFM on EVPN E-LAN is critical for service providers and enterprises to ensure high availability and reliability of their distributed Ethernet services.

- CFM on EVPN E-Line Single-Homing: CFM on EVPN E-Line ensures that service providers can monitor and maintain the health of point-to-point Ethernet services over a packet-switched network.

Restrictions for CFM on EVPN

- There is a possibility of unusual or unexpected results (also known as artifacts) appearing in the loopback or linktrace results. Either a loopback or linktrace may report multiple results for the same instance, or consecutive instances of a loopback and linktrace between the same two endpoints may produce different results.

Supported Offload Types and Timer Values

Continuity Check Messages (CCMs) are heartbeat messages exchanged periodically between all the Maintenance End Points (MEPs) in a service. Each MEP sends out multicast CCMs, and receives CCMs from all the other MEPs in the service. This allows each MEP to discover its peer MEPs, and to verify that there is connectivity between them. The offload type depends on where the CCMs are processed.

Only Non-offload is supported, where the CCMs are generated and processed by the CPU. The CCM timers for a CFM session on a or Bundle Interfaces are 1 second or greater.

CCM timers are the intervals in which CCMs are sent and received. If the CCMs are not received within the configured interval, the CFM MEP goes down. The following are the supported CCM timers for the Non-offload type:

- 1 sec

- 10 sec

- 1 min

- 10 min

CFM on EVPN E-LAN Single-Homing

You can configure CFM on a network running with EVPN Emulated Local Area Network (E-LAN) services on single-homed devices to monitor the E-LAN services, thereby providing high-speed Layer 2 services with high resiliency.

Restrictions for CFM on EVPN E-LAN

- CFM on EVPN E-LAN is supported only on single-homed devices.

Configure CFM on EVPN E-LAN Single-Homing

Figure 1: CFM on EVPN E-LAN: Full Mesh Topology
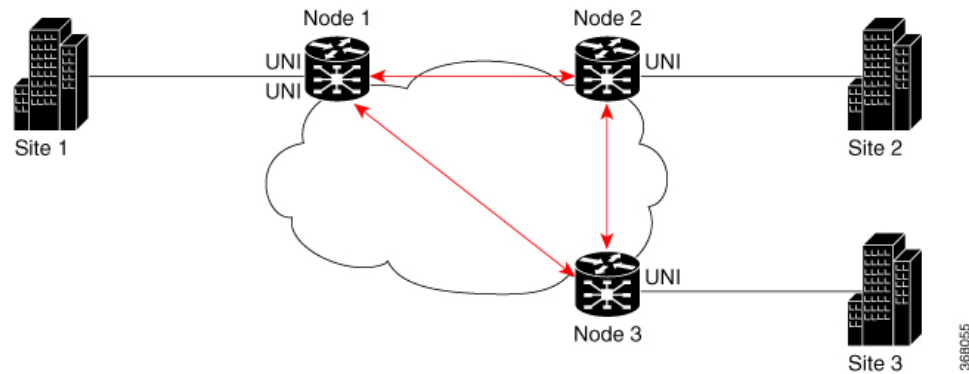
Nodes 1, 2 and 3 in this topology are Cisco routers and are connected to each other.

Configuring CFM on EVPN E-LAN involves the following tasks:

- Enabling CFM service continuity check.
- Configuring Maintenance End Point (MEP) cross-check to validate the liveliness and consistency of remote MEPs in the network.
- Enabling CFM for the interface.

Configuration Example for CFM on EVPN E-LAN: Full Mesh Topology

```
/* Enable CFM continuity check */
Router# ethernet cfm
Router(config-cfm# domain bd-domain level 1 id null
Router(config-cfm-dmn)# service bd-domain bridge group bg-elan bridge-domain bd-elan id
icc-based MC MCMC
Router(config-cfm-dmn-svc)# continuity-check interval 10s

/* Configure MEP cross-check */
Router(config-cfm-dmn-svc)# mep crosscheck
Router(config-cfm-dmn-svc)# mep-id 1112
Router(config-cfm-dmn-svc)# mep-id 1113
Router(config-cfm-dmn-svc)# commit
```

Repeat the above configurations for node 2 and node 3, with the respective mep-id values. For node 2, configure MEP cross-check with respective mep-id values of node 1 and node 3 (1111 and 1113 respectively, in this example). For node 3, configure MEP cross-check with respective mep-id values of node 1 and node 2 (1111 and 1112 respectively, in this example).

```
/* Enable CFM on the interface */
Router(config)# interface TenGigE 0/0/0/2.100 l2transport
Router(config-subif)# description bg-elan
Router(config-subif)# encapsulation dot1q 100
Router(config-subif)# rewrite ingress tag pop 1 symmetric
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain bd-domain service bd-service mep-id 1111
Router(config-if-cfm-mep)# commit
```

You must repeat the above configurations for node 2 and node 3, with the respective *mep-id* values (that is, 1112 for node 2 and 1113 for node 3, in this example).

Running Configuration for CFM on EVPN E-LAN: Full Mesh Topology

This sections shows the running configuration on node 1.

```
ethernet cfm
 domain bd-domain level 1 id null
  service bd-domain bridge group bg-elan bridge-domain bd-elan id icc-based MC MCMC
   continuity-check interval 10s
   mep crosscheck
    mep-id 1112
    mep-id 1113
   !
  !
 !
!

interface TenGigE 0/0/0/2.100 l2transport
 description bg-elan
 encapsulation dot1q 100
 rewrite ingress tag pop 1 symmetric
 ethernet cfm
  mep domain bd-domain service bd-service mep-id 1111
  !
```

Verification

The following outputs show the CFM configuration.

```
Router# show run ethernet cfm

ethernet cfm
  domain bd-domain level 1 id null
  service bd-domain bridge group bg-elan bridge-domain bd-elan id icc-based MC MCMC
   continuity-check interval 10s
   mep crosscheck
    mep-id 1112
    mep-id 1113
```
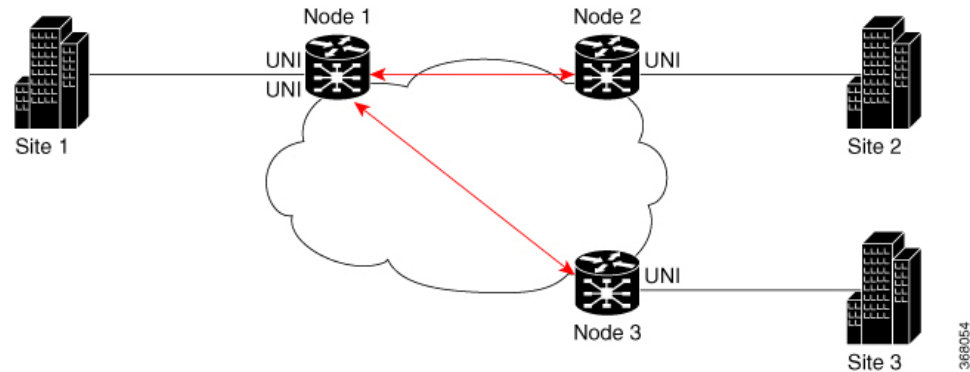
```
Router# show run interface TenGigE 0/0/0/2.100

interface TenGigE 0/0/0/2.100 l2transport
 description bg-elan
 encapsulation dot1q 100
 rewrite ingress tag pop 1 symmetric
 ethernet cfm
  mep domain bd-domain service bd-service mep-id 1111
```

Figure 2: CFM on EVPN E-LAN: Hub and Spoke Topology

Nodes 1, 2 and 3 in this topology are Cisco routers. Node 1 acts as the hub, whereas Node 2 and Node 3 are connected to the hub, Node1.

Configuration Example for CFM on EVPN E-LAN: Hub and Spoke Topology

The CFM configuration for the hub and spoke topology remains the same as that of full mesh topology mentioned above, except for these additional steps for SLA profile configuration to be done under the interface. You need to configure the SLA profile between the hub and the spokes to ensure continuous network services.

```
/* 1112 and 1113 in this example, are the mep-id values of node 2 and node 3 */
Router(config)#interface TenGigE 0/0/0/2.100 l2transport
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain bd-domain service bd-service mep-id 1111
Router(config-if-cfm-mep)# sla operation profile test-profile1 target mep-id 1112
Router(config-if-cfm-mep)# sla operation profile test-profile2 target mep-id 1112
Router(config-if-cfm-mep)# sla operation profile test-profile1 target mep-id 1113
Router(config-if-cfm-mep)# sla operation profile test-profile2 target mep-id 1113
Router(config-if-cfm-mep)# commit
```

Running Configuration for CFM on EVPN E-LAN: Hub and Spoke Topology

This sections shows the running configuration on node 1.

```
interface TenGigE 0/0/0/2.100 l2transport
 description bg-elan
 encapsulation dot1q 100
 rewrite ingress tag pop 1 symmetric
 ethernet cfm
  mep domain bd-domain service bd-service mep-id 1111
   sla operation profile test-profile1 target mep-id 1112
   sla operation profile test-profile2 target mep-id 1112
   sla operation profile test-profile1 target mep-id 1113
   sla operation profile test-profile2 target mep-id 1113
 !
```

Configuration Examples for Different Types of Domains

Example 1: Configuration of Up MEPs with same domain and level on the following:

- Multiple AC per bridge domain on local

- Single AC per bridge domain on remote

```
/* Enable Ethernet CFM continuity check*/
Router(config)# ethernet cfm
Router(config-cfm)# domain BD-DOMAIN level 4 id null
Router(config-cfm-dmn)# service BD-SERVICE bridge group ELAN_FUNC_3 $
Router(config-cfm-dmn-svc)# continuity-check interval 10s

/* Configure MEP cross-check */
Router(config-cfm-dmn-svc)# mep crosscheck
Router(config-cfm-xcheck)# mep-id 5
Router(config-cfm-xcheck)# mep-id 1101
Router(config-cfm-xcheck)# mep-id 1103

/* Configure bridge domain and assign interfaces to the bridge domain */
Router(config)# l2vpn
Router(config-l2vpn)# bridge group ELAN_FUNC_3
Router(config-l2vpn-bg)# bridge-domain FUNC_3
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/0.1
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/1.2
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# evi 101

/* Enable CFM on the interfaces */
Router(config)# interface TenGigE0/0/0/0.1 l2transport
Router(config-subif)# encapsulation dot1q 2
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain BD-DOMAIN service BD-SERVICE mep-id 1103


Router(config)# interface TenGigE0/0/0/1.2 l2transport
Router(config-subif)# encapsulation dot1q 2
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain BD-DOMAIN service BD-SERVICE mep-id 5
```

Running Configuration

```
ethernet cfm
 domain BD-DOMAIN level 4 id null
  service BD-SERVICE bridge group ELAN_FUNC_3 bridge-domain FUNC_3 id number 100
   continuity-check interval 10s
   mep crosscheck
    mep-id 5
    mep-id 1101
    mep-id 1103

l2vpn
 bridge group ELAN_FUNC_3
  bridge-domain FUNC_3
   interface TenGigE0/0/0/0.1
   !
   interface TenGigE0/0/0/1.2
   !
   evi 101

interface TenGigE0/0/0/0.1 l2transport
 encapsulation dot1q 1
 ethernet cfm
  mep domain BD-DOMAIN service BD-SERVICE mep-id 1103
```

```
interface TenGigE0/0/0/1.2 l2transport
 encapsulation dot1q 2
 ethernet cfm
  mep domain BD-DOMAIN service BD-SERVICE mep-id 5
```

Example 2: Configuration of multiple Up MEPs on AC interfaces that are part of the same bridge domain:

```
/* Enable Ethernet CFM continuity check */
Router(config)# ethernet cfm
Router(config-cfm)# domain BD-DOMAIN level 4 id null
Router(config-cfm-dmn)# service BD-SERVICE bridge group ELAN_FUNC_3 bridge-domain FUNC_3 $
Router(config-cfm-dmn-svc)# continuity-check interval 10s

/* Configure MEP cross-check */
Router(config-cfm-dmn-svc)# mep crosscheck
Router(config-cfm-xcheck)# mep-id 1
Router(config-cfm-xcheck)# mep-id 2
Router(config-cfm-xcheck)# mep-id 21
Router(config-cfm-xcheck)# mep-id 22

/* Enable Ethernet CFM continuity check for another domain level */
Router(config)# ethernet cfm
Router(config-cfm)# domain BD-DOMAIN1 level 3 id null
Router(config-cfm-dmn)# service BD-SERVICE1 bridge group ELAN_FUNC_3 bridge-domain FUNC_3
$
Router(config-cfm-dmn-svc)# continuity-check interval 10s

/* Configure MEP cross-check */
Router(config-cfm-dmn-svc)# mep crosscheck
Router(config-cfm-xcheck)# mep-id 1001
Router(config-cfm-xcheck)# mep-id 1021
Router(config-cfm-xcheck)# mep-id 2001
Router(config-cfm-xcheck)# mep-id 2021

/* Configure bridge domain and assign interfaces to the bridge domain */
Router(config)# l2vpn
Router(config-l2vpn)# bridge group ELAN_FUNC_3
Router(config-l2vpn-bg)# bridge-domain FUNC_3
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/0
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/1
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# evi 101

/* Enable CFM on the interfaces with multiple MEPs */
Router(config)# interface TenGigE0/0/0/0.1 l2transport
Router(config-subif)# encapsulation dot1q 1
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain BD-DOMAIN service BD-SERVICE mep-id 21
Router(config-if-cfm-mep)# exit
Router(config-if-cfm)# mep domain BD-DOMAIN1 service BD-SERVICE1 mep-id 1021

Router(config)# interface TenGigE0/0/0/1.2 l2transport
Router(config-subif)# encapsulation dot1q 2
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain BD-DOMAIN service BD-SERVICE mep-id 22
Router(config-if-cfm-mep)# exit
Router(config-if-cfm)# mep domain BD-DOMAIN1 service BD-SERVICE1 mep-id 2021
```

Running Configuration

```
ethernet cfm
 domain BD-DOMAIN level 4 id null
    service BD-SERVICE bridge group ELAN_FUNC_3 bridge-domain FUNC_3 id number 100
   continuity-check interval 10s
   mep crosscheck
    mep-id 1
    mep-id 2
    mep-id 21
    mep-id 22

 domain BD-DOMAIN1 level 3 id null
  service BD-SERVICE1 bridge group ELAN_FUNC_3 bridge-domain FUNC_3
   continuity-check interval 10s
   mep crosscheck
    mep-id 1001
    mep-id 1021
    mep-id 2001
    mep-id 2021


l2vpn
 bridge group ELAN_FUNC_3
  bridge-domain FUNC_3
   interface TenGigE0/0/0/0
   interface TenGigE0/0/0/1
   Interface TenGigE0/0/0/2
   evi 101

 interface TenGigE0/0/0/0.1 l2transport
 encapsulation dot1q 1
 ethernet cfm
  mep domain BD-DOMAIN service BD-SERVICE mep-id 21
  mep domain BD-DOMAIN1 service BD-SERVICE1 mep-id 1021


interface TenGigE0/0/0/1.2 l2transport
 encapsulation dot1q 2
 ethernet cfm
  mep domain BD-DOMAIN service BD-SERVICE mep-id 22
  mep domain BD-DOMAIN1 service BD-SERVICE1 mep-id 2021
```

Example 3: Configuration of multiple services for different EVPN bridge domains:

```
/* Enable Ethernet CFM continuity check */
Router(config)# ethernet cfm
Router(config-cfm)#  domain evpn-bd level 4 id null
Router(config-cfm-dmn)# service evpn-bd1 bridge group BG1 bridge-domain BD1 $
Router(config-cfm-dmn-svc)# continuity-check interval 10s

/* Configure MEP cross-check */
Router(config-cfm-dmn-svc)# mep crosscheck
Router(config-cfm-xcheck)# mep-id 5
Router(config-cfm-xcheck)# mep-id 6
Router(config-cfm-xcheck)# mep-id 1101
Router(config-cfm-xcheck)# mep-id 1103

/* Enable Ethernet CFM continuity check for another service */
Router(config)# ethernet cfm
Router(config-cfm)#  domain evpn-bd level 4 id null
```

```
Router(config-cfm-dmn)# service evpn-bd2 bridge group BG2 bridge-domain BD2 $
Router(config-cfm-dmn-svc)# continuity-check interval 10s

/* Configure MEP cross-check */
Router(config-cfm-dmn-svc)# mep crosscheck
Router(config-cfm-xcheck)# mep-id 11
Router(config-cfm-xcheck)# mep-id 21
Router(config-cfm-xcheck)# mep-id 101

/* Configure bridge domain and assign interfaces to the bridge domain */
Router(config)# l2vpn
Router(config-l2vpn)# bridge group BG1
Router(config-l2vpn-bg)# bridge-domain BD1
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/0.1
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/1.2
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# evi 101

/* Configure another bridge domain and assign interfaces to the bridge domain */
Router(config)# l2vpn
Router(config-l2vpn)# bridge group BG2
Router(config-l2vpn-bg)# bridge-domain BD2
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/2.1
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/5.2
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# evi 201

/* Enable CFM on the interfaces with different services*/
Router(config)# interface TenGigE0/0/0/0.1 l2transport
Router(config-subif)# encapsulation dot1q 1
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain evpn-bd service evpn-bd1 mep-id 1103

Router(config)# interface TenGigE0/0/0/1.2 l2transport
Router(config-subif)# encapsulation dot1q 2
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain evpn-bd service evpn-bd1 mep-id 5

Router(config)# interface TenGigE0/0/0/2.1 l2transport
Router(config-subif)# encapsulation dot1q 1
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain evpn-bd service evpn-bd2 mep-id 101

Router(config)# interface TenGigE0/0/0/5.2 l2transport
Router(config-subif)# encapsulation dot1q 2
Router(config-subif)# ethernet cfm
Router(config-if-cfm)#   mep domain evpn-bd service evpn-bd2 mep-id 11
```

Running Configuration

```
ethernet cfm
 domain evpn-bd level 4 id null
  service evpn-bd1 bridge group BG1 bridge-domain BD1
   continuity-check interval 10s
  mep crosscheck
   mep-id 5
   mep-id 6
   mep-id 1101
   mep-id 1103
  service evpn-bd2 bridge group BG2 bridge-domain BD2
```

```
      continuity-check interval 10s
      mep crosscheck
       mep-id 11
       mep-id 21
       mep-id 101

  l2vpn
   bridge group BG1
    bridge-domain BD1
      interface TenGigE0/0/0/0.1
      interface TenGigE0/0/0/1.2
      evi 101
  bridge group BG2
    bridge-domain BD2
      interface TenGigE0/0/0/2.1
      interface TenGigE0/0/0/5.2
      evi 201

  interface TenGigE0/0/0/0.1 l2transport
   encapsulation dot1q 1
   ethernet cfm
    mep domain evpn-bd service evpn-bd1 mep-id 1103

  interface TenGigE0/0/0/1.2 l2transport
   encapsulation dot1q 2
   ethernet cfm
    mep domain evpn-bd service evpn-bd1 mep-id 5

  interface TenGigE0/0/0/2.1 l2transport
   encapsulation dot1q 1
   ethernet cfm
    mep domain evpn-bd service evpn-bd2 mep-id 101

  interface TenGigE0/0/0/5.2 l2transport
   encapsulation dot1q 2
   ethernet cfm
    mep domain evpn-bd service evpn-bd2 mep-id 11
```

Example 4: Configuration of different EVPN bridge domains on different domain levels:

```
/* Enable Ethernet CFM continuity check */
Router(config)# ethernet cfm
Router(config-cfm)# domain evpn-bd level 4 id null
Router(config-cfm-dmn)# service evpn-bd1 bridge group BG1 bridge-domain BD1 $
Router(config-cfm-dmn-svc)# continuity-check interval 10s

/* Configure MEP cross-check */
Router(config-cfm-dmn-svc)# mep crosscheck
Router(config-cfm-xcheck)# mep-id 5
Router(config-cfm-xcheck)# mep-id 6
Router(config-cfm-xcheck)# mep-id 1101
Router(config-cfm-xcheck)# mep-id 1103

/* Enable Ethernet CFM continuity check for another domain and service */
Router(config)# ethernet cfm
Router(config-cfm)# domain evpn-bd2 level 3 id null
Router(config-cfm-dmn)# service evpn-bd2 bridge group BG2 bridge-domain BD2 $
Router(config-cfm-dmn-svc)# continuity-check interval 10s

/* Configure MEP cross-check */
Router(config-cfm-dmn-svc)# mep crosscheck
Router(config-cfm-xcheck)# mep-id 11
Router(config-cfm-xcheck)# mep-id 21
```

```
Router(config-cfm-xcheck)# mep-id 101
Router(config-cfm-xcheck)# mep-id 201

/* Configure bridge domain and assign interfaces to the bridge domain */
Router(config)# l2vpn
Router(config-l2vpn)# bridge group BG1
Router(config-l2vpn-bg)# bridge-domain BD1
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/0.1
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/1.2
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# evi 101

/* Configure another bridge domain and assign interfaces to the bridge domain */
Router(config)# l2vpn
Router(config-l2vpn)# bridge group BG2
Router(config-l2vpn-bg)# bridge-domain BD2
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/2.1
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# interface TenGigE0/0/0/5.2
Router(config-l2vpn-bg-bd-ac)# exit
Router(config-l2vpn-bg-bd)# evi 201

/* Enable CFM on the interfaces with different domains and services*/
Router(config)# interface TenGigE0/0/0/0.1 l2transport
Router(config-subif)# encapsulation dot1q 1
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain evpn-bd service evpn-bd1 mep-id 1103

Router(config)# interface TenGigE0/0/0/1.2 l2transport
Router(config-subif)# encapsulation dot1q 2
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain evpn-bd service evpn-bd1 mep-id 5

Router(config)# interface TenGigE0/0/0/2.1 l2transport
Router(config-subif)# encapsulation dot1q 1
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain evpn-bd2 service evpn-bd2 mep-id 101

Router(config)# interface TenGigE0/0/0/5.2 l2transport
Router(config-subif)# encapsulation dot1q 2
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain evpn-bd2 service evpn-bd2 mep-id 11
```

Running Configuration

```
ethernet cfm
 domain evpn-bd level 4 id null
  service evpn-bd1 bridge group BG1 bridge-domain BD1
   continuity-check interval 10s
   mep crosscheck
    mep-id 5
    mep-id 6
    mep-id 1101
    mep-id 1103
   !
  !
 !
 domain evpn-bd2 level 3 id null
  service evpn-bd2 bridge group BG2 bridge-domain BD2
   continuity-check interval 10s
```

```
    mep crosscheck
     mep-id 11
     mep-id 21
     mep-id 101
     mep-id 201
     !
    !
   !
  !
 l2vpn
  bridge group BG1
   bridge-domain BD1
     interface TenGigE0/0/0/0.1
     !
     interface TenGigE0/0/0/1.2
     !
     evi 101
     !
    !
   !
  bridge group BG2
   bridge-domain BD2
     interface TenGigE0/0/0/2.1
     !
     interface TenGigE0/0/0/5.2
     !
     evi 201
     !
    !
   !
  !
 interface TenGigE0/0/0/0.1 l2transport
  encapsulation dot1q 1
  ethernet cfm
   mep domain evpn-bd service evpn-bd1 mep-id 1103
   !
  !
 !

 interface TenGigE0/0/0/1.2 l2transport
  encapsulation dot1q 2
  ethernet cfm
   mep domain evpn-bd service evpn-bd1 mep-id 5
   !
  !
 !

 interface TenGigE0/0/0/2.1 l2transport
  encapsulation dot1q 1
  ethernet cfm
   mep domain evpn-bd2 service evpn-bd2 mep-id 101
   !
  !
 !

 interface TenGigE0/0/0/5.2 l2transport
  encapsulation dot1q 2
  ethernet cfm
   mep domain evpn-bd2 service evpn-bd2 mep-id 11
   !
  !
 !
```

CFM on EVPN E-Line Single-Homing

You can configure CFM on a network running with EVPN E-Line single-homed devices to monitor the E-Line services, that provides high-speed Layer 2 services with high resiliency.

Restrictions for CFM on EVPN E-Line

• CFM up MEP is supported only on single-homing Layer 2 main and subinterfaces.

Configure CFM on EVPN E-Line Single-Homing

Figure 3: CFM on EVPN E-Line: Full Mesh
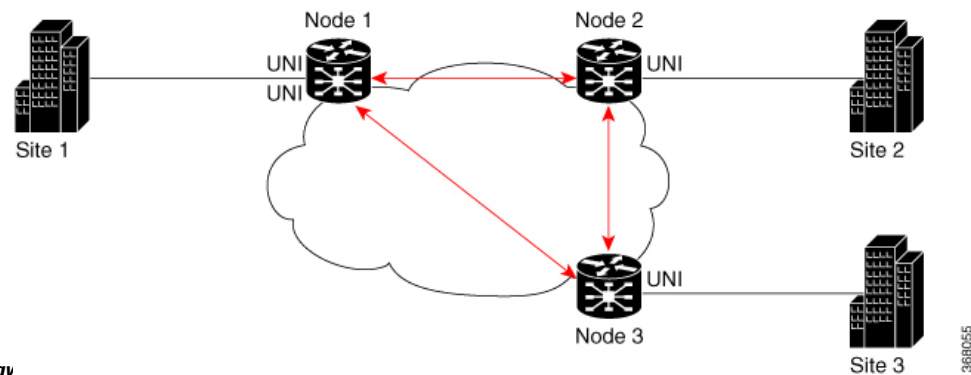
Topology

Nodes 1, 2 and 3 in this topology are Cisco routers and are connected to each other.

Configuring CFM on EVPN E-Line involves the following tasks:

• Enabling CFM service continuity check.

• Configuring Maintenance End Point (MEP) cross-check to validate the liveliness and consistency of remote MEPs in the network.

• Enabling CFM for the interface.

Configuration Example

```
/* Enable CFM continuity check */
Router# ethernet cfm
Router(config-cfm# domain xcup1 level 7 id null
Router(config-cfm-dmn)# service xcup1 xconnect group evpn_vpws_Bundle_ether203 p2p
evpn_vpws-100 id number 4001
Router(config-cfm-dmn-svc)# continuity-check interval 1s

/* Configure MEP cross-check */
Router(config-cfm-dmn-svc)# mep crosscheck
Router(config-cfm-dmn-svc)# mep-id 4001
Router(config-cfm-dmn-svc)# commit
```

Repeat the above configurations for node 2 and node 3, with the respective mep-id values. For node 2, configure MEP cross-check with respective mep-id values of node 1 and node 3 (2001 and 3001 respectively, in this

example). For node 3, configure MEP cross-check with respective mep-id values of node 1 and node 2 (4001 and 2001 respectively, in this example).

```
/* Enable CFM on the interface */
Router# configure
Router(config)# interface Bundle-Ether203.2001 l2transport
Router(config-subif)# encapsulation dot1q 2001
Router(config-subif)# ethernet cfm
Router(config-if-cfm)# mep domain xcup1 service xcup1 mep-id 2001
Router(config-if-cfm-mep)# commit
```

You must repeat the above configurations for node 2 and node 3, with the respective *mep-id* values.

Running Configuration

This sections shows the running configuration on node 1.

```
ethernet cfm
 domain xcup1 level 7 id null
  service xcup1 xconnect group evpn_vpws_Bundle_ether203 p2p evpn_vpws-100 id number 4001
   continuity-check interval 1s
   mep crosscheck
    mep-id 4001
    !
   !
 !
!
interface Bundle-Ether203.2001 l2transport
 encapsulation dot1q 2001
 ethernet cfm
  mep domain xcup1 service xcup1 mep-id 2001
 !
```

Verification

The following example shows CFM configuration.

```
Router# show ethernet cfm services

   Summary for Domain xcup1 (level 7), Service xcup1
================================================================================
Domain MIB index: 1, Service MIB index: 1
Domain ID: NULL, Service ID: UINT: 4001
Service configured on P2P cross-connect evpn_vpws-100 in group evpn_vpws_Bundle_ether
CCM interval: 1s
Local MEPs: 1 total
Peer MEPs: 2 total
MIPs: 0, MIP creation rule: always
```