CFM Configuration

Contents

Chapter 1 CFM Configuration

1.1 Brief Introduction to CFM

CFM (Connectivity Fault Management, the connectivity fault management protocol), defined by the IEEE 802.1ag standard is a Layer 2 link on the VLAN-based end to end OAM mechanism used to Carrier Ethernet fault management.

1.1.1 CFM Concepts

Table 1-1 CFM concepts

Concept	Remark
MD	Maintenance field indicates that even the fault detection is covered through a network of its boundary is configured on a port range defined by the MEPs. Maintenance of the domain of "maintaining the domain name" to identify, according to network planning can be divided into eight levels. Between different domains can be maintained adjacent to or nested, but can't cross, and the nested domain can only be maintained by the high-level domain to the low level maintenance nested, that is, low-level maintenance of the domain must be included in the domain of high-level maintenance department.
Maintenance set	Within the maintenance domain can be configured as needed to maintain multiple sets, each set is maintained within some maintenance to maintain the set point. Maintenance set to "maintain the domain name + maintenance set name" to identify. Maintain set service on a VLAN, to maintain focus on the maintenance point of sending packets of the band are the VLAN tag, at the same time maintaining focus on the maintenance point can receive by maintaining focus on its maintenance point sent the message.
Maintenance point	Maintenance points configured on a port, part of a maintenance set, can be divided into MEPs and MIPs two. (1) MEP ID in order to maintain endpoint identity, which defines the scope and maintenance of the domain boundary. MEP has a directional, sub-UP MEP and DOWN MEP for the two. MEP direction that the maintenance of domain relative to the location of the port. DOWN MEP is the port where to send its message, UP MEP port where it is not sent to the message, but it is the port to the device send its message. (2) Maintenance in the maintenance of the domain between points within the department, not the main action issued CFM protocol packets, but can handle and respond to CFM protocol packets.

1.1.2 CFM Main Function

Connectivity fault detection based on a reasonable and effective application deployment and configuration over the network, its function is maintained in the configuration between points, as long as the following functions:

Table 1-2 CFM main function

Function	Remark
Continuity detection	It is a proactive OAM functionality is used to detect the state to maintain connectivity between endpoints. Connectivity failure may be caused by equipment failure or configuration error.
Loopback	It is a kind of on-demand OAM functions for the local device and remote authentication between end devices connected state.
Link tracking	It is a kind of on-demand OAM functions for the local device to determine the path between the remote devices, in order to achieve the positioning of link failure.

1.2 Configuring CFM

CFM function in the configuration before the network should carry the following plan:
● For the maintenance of the entire network to carry out sub-domain level, determine the level of maintenance of the domain boundary.
● Determine the maintenance of the domain name, the same domain on a different device to maintain the same name.
● Required monitoring of VLAN, determine the set of maintenance within the maintenance domain.
● Determine the maintenance set name, the same maintenance domain within the same set on different devices to maintain the same name.
● That the same maintenance domain within the same set of maintenance to maintain a list of endpoints in the different devices should remain the same.
● In the maintenance field and set the boundaries of the maintenance port on the endpoint should be planned maintenance, non-border or port equipment maintenance can be planned on a mid-point.
After the completion of network planning, come line the following configuration.

1.2.1 CFM Configuration Task List

Table 1-3 CFM Configuration Task List

Configuration Tasks		Remark	Detailed configuration
CFM basic configuration	Configured to maintain field	Required	1.2.2
	Configuration and maintenance level domain name	Required	1.2.3
	Configuration to maintain set	Required	1.2.4
	Configuration name and the associated VLAN to maintain set	Required	1.2.5

	Configuration MEPs	Required	1.2.6
	Configure Remote Maintenance endpoint	Required	1.2.7
	Configuring MIPs	Optional	1.2.8
Configuring CFM various functions	Configuration continuity detection	Required	1.2.9
	Configure loopback	Optional	1.2.10
	Configure the link tracking	Optional	1.2.11
Display and maintenance of the CFM		Optional	1.2.12

1.2.2 Maintain Field Configuration

Table 1-4 maintain field configuration

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	-
Create a maintenance domain, and domain configuration into maintenance mode	**cfm md** *md-index*	Required

1.2.3 Configuration and Maintenance Level Domain Name

In order to distinguish between the various maintenance domain, you can specify a different domain for each maintenance of domain names, the name by the name of the format and content of two parts, the whole network a unique domain name is best; to show nested relationship between the maintenance domain, must also designated to maintain the domain level, only the level of maintenance of large domain nested level can only be a small maintenance domain.

Table 1-5 Configuration and maintenance level domain name

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	-
Domain configuration into maintenance mode	**cfm md** *md-index*	-
Configuration without the maintenance of domain names, only the specified field level maintenance	**cfm md format** none **level** *md-level*	Either of the two
Equipped with the maintenance of the domain name, and specify the domain name and	**cfm md format {dns-name | mac-uint |none| string}** **name** *md-name* **level** *md-level*	

| level of maintenance | | |

1.2.4 Maintain Set Configuration

Table 1-6 to maintain set configuration

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	-
To maintain the domain configuration mode to enter	**cfm md** *md-index*	-
Created to maintain set, and enter the configuration mode set to maintain	**cfm ma** *ma-index*	Required

1.2.5 Configuration Name and Associated VLAN to Maintain Set

In order to maintain the distinction between the various domains to maintain set, you can specify a different set for each to maintain the instance name, instance name, the name by the name of the format and content of two parts, the maintenance of set where the maintenance of the domain name plus the instance name must ensure that all network only.

Table 1-7 Configuration name and the associated VLAN to maintain set

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	-
To maintain the domain configuration mode to enter	**cfm md** *md-index*	-
Enter the configuration mode set to maintain	**cfm ma ma-index**	-
The name of the configuration set and maintain the VLAN associated with the main	**cfm ma format {primary-vid | string | uint16 | vpn-id} name** *ma-name* **primary-vlan** *vlan-id*	Required

1.2.6 Configuration MEPs

CFM is mainly reflected in the maintenance of a variety of endpoints operating on, the user can program the network port on the network configuration to maintain the boundary endpoints.

Table 1-8 Configuration MEPs

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	-
To maintain the domain configuration mode to enter	**cfm md** *md-index*	-
Enter the configuration mode set to maintain	**cfm ma** *ma-index*	-
Create a maintenance endpoint, and specify its associated port	**cfm mep** *mep-id* **direction** {up | down} *[primary-vlan vlan-id]* **interface ethernet** *port-id*	Required
Enable the state to maintain endpoint management	**cfm mep** *mep-id* **state** {enable | disable}	Required Default is off
CCM and configure the endpoint to send maintenance to use the priority LTM	**cfm mep** *mep-id* **priority** *priority-id*	Optional Default priority is 0

1.2.7 Configure Remote Maintenance Endpoint

Remote maintenance end point is equivalent to the local maintenance of the end points, and in the maintenance of concentration, in addition to the maintenance of the local endpoint, all other maintenance endpoints should be configured in the local endpoint for the remote maintenance.

Table 1-9 Configure Remote Maintenance endpoint

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	-
To maintain the domain configuration mode to enter	**cfm md** *md-index*	-
Enter the configuration mode set to maintain	**cfm ma** *ma-index*	-
Creating remote maintenance end point, and specify the end of its peer MEPs	**cfm rmep** *rmep-id* **mep** *mep-id*	Required

1.2.8 Configuring MIPs

MIPs used to test the response of CFM message, the user can program the network device or in non-border ports configured to maintain the mid-point.

Table 1-10 Configuring MIPs

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	-
To maintain the domain configuration mode to enter	**cfm md** *md-index*	-
Enter the configuration mode set to maintain	**cfm ma** *ma-index*	-
Create a maintenance intermediate point, and specify its associated port	**cfm mip** *mip-id* **interface ethernet** *port-id*	Optional

1.2.9 Configuration Continuity Detection

Continuity detection through configuration, can be made   to maintain interoperability between endpoint CCM packets to check the connectivity between these endpoints maintain state in order to achieve the link connectivity management.

Table 1-11 Configuration continuity detection

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	-
To maintain the domain configuration mode to enter	**cfm md** *md-index*	-
Enter the configuration mode set to maintain	**cfm ma** *ma-index*	-
Configuration maintenance interval endpoint to send the CCM	**cfm cc interval** {1 | 10 | 60 | 600}	Optional The default value is 1s
Enable sending MEP ccm	**cfm mep** *mep-id* **cc** {enable | disable}	Required Default is off

Caution:
Different devices at the same maintenance domain and maintain a centralized maintenance endpoint, the sending time interval of CCM must be the same.

1.2.10 Configure Loopback

By configuring the loopback function, you can check the source to the target MEPs MEPs or MIPs link between the situations in order to achieve the link connectivity verification.

Table 1-12 Configure loopback

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	-
To maintain the domain configuration mode to enter	**cfm md** *md-index*	-
Enter the configuration mode set to maintain	**cfm ma** *ma-index*	-
Start loopback	**cfm loopback mep** *mep-id {dst-mac mac-address* | *dst-mep rmep-id}* **[priority** *pri-id* | **count** *pkt-num* | **length** *data-len* | *data pkt-data]*	Optional

1.2.11 Configure Link Tracking

By configuring the link tracking, you can find the source to the target MEPs MEPs or maintenance intermediate point between the path in order to achieve the positioning of link failure.

Table 1-13 Configure the link tracking

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	-
To maintain the domain configuration mode to enter	**cfm md** *md-index*	-
Enter the configuration mode set to maintain	**cfm ma** *ma-index*	-
Start Tracking link	**cfm linktrace mep** *mep-id {dst-mac mac-address* | *dst-mep rmep-id}* **[timeout** *pkt-time* | **ttl** *pkt-ttl* | **flag** *{use-mpdb* | *unuse-mpdb}]*	Optional

1.2.12 Display and Maintenance of CFM

After completing the above configuration, you can use the following command to display the CFM configuration.

Table 1-14 Display and maintenance of the CFM

Operation	Command	Remarks
The Maintenance domain information	**show cfm** *md [md-index]*	Perform either of

The Maintenance Set Information	**show cfm ma**	the commands
Display the end point of maintenance information	**show cfm mp local**	
Remote maintenance point information display	**show cfm mp remote**	
Display CCM statistics	**show cfm cc**	
Clear CCM statistics	**clear cfm cc**	
CCM database information display	**show cfm cc database**	
Clear CCM database information	**clear cfm cc database**	
CFM alarm information display	**show cfm errors**	