Criteria for Naming Multilink PPP Bundles

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Introduction

This document explains Multilink PPP (MP), and how to select the criteria for naming MP bundles.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on this software version:

  • Cisco IOS® Software Release 11.3(4)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Background Information

Multilink PPP allows devices to send data over multiple point−to−point data links to the same destination by implementing a named virtual link. The MP connection has a maximum bandwidth equal to the sum of the component links bandwidth. MP can be configured for all interfaces that support PPP. Refer to RFC 1990 ↗

for more information on MP.

Cisco IOS software builds a multilink bundle name based on the PPP authenticated name first, then based on the endpoint discriminator. With Cisco IOS in its default state, all client links that use the same username are bundled together into the same MP virtual connection. For a client using MP, each connection is authenticated by the access server using the same username and added to the same MP bundle. This setup works well when every client uses a unique username to connect to the access server. However, if multiple clients use the same username with MP, some of them are incorrectly added to a bundle initiated by a different client. Another problem occurs when interoperating with non–Cisco routers in a bi–directional dial environment. If the non–Cisco router does not use the authenticated name as a name for the bundle, but the Cisco router does, two different bundles are created.

In situations in which many clients use the same username to initiate an MP connection, or when interoperating with non–Cisco routers, you need to control the order in which the bundle name is created. It is necessary to configure the access server to create a bundle name based on the endpoint discriminator first, the username second, or both. The endpoint discriminator identifies the system transmitting the packet and advises the network access server (NAS) that the peer on this link could be the same as the peer on another existing link. Because every client has a unique endpoint discriminator, only multiple links from the same client are bundled into a single unique MP connection. For example, consider when two PC clients initiate a multilink connection to an access server using the same username. If the multilink bundle name is established based on the endpoint discriminator first, then on the username or on both, the NAS can accurately bundle the links from each client using the endpoint discriminator as a bundle name. This bundle name is unique to the peer system transmitting the packet.

Note: When the authentication on a link is done in one direction only, without the authentication of the peer but with the requirement that the local host authenticate itself with use of the Challenge Handshake Authentication Protocol (CHAP), the username supplied by the peer in its CHAP challenge is treated as the peer authenticated name in order to determine the bundle name.

multilink bundle–name Command

You can change the criteria that is selected for naming a multilink bundle if you issue the **multilink bundle–name {authenticated | endpoint | both}** global configuration command. With the use of different required keywords, you can select the criteria used to create the multilink bundles. The keywords are:

- **authenticated** Use the peer authenticated name as the bundle name.
- **endpoint** Use the peer endpoint discriminator as the bundle name. This identifier is expected to refer to the mechanical equipment associated with the transmitting system and can be presented in many different formats. Refer to RFC 1990 ⤴ for more information.
- **both** Use the peer authenticated name and endpoint discriminator as the bundle name.

Note: If you change the criteria for assigning multilink bundle names, only calls subsequent to the change are affected.

Use of the authenticated Keyword

Use the **authenticated** keyword to name the bundle using the authenticated name. This option cannot support multiple clients using the same authentication username.

```
bobslake-nas-01(config)#multilink bundle-name authenticated
```

Note: This option is the default and does not appear in the running configuration.

The MP bundle name is created with the use of one of these options:

- The authenticated name of the clients.
- The endpoint discriminator if the link is not authenticated.
- The caller ID if neither the authenticated name nor the endpoint discriminator is supplied.

Use of the endpoint Keyword

Use the **endpoint** keyword to name the bundle as defined by the endpoint discriminator. This option can support multiple clients using the same authentication username since the bundle name is assigned independently of the client username. This endpoint keyword is often used when interoperating with non–Cisco routers in a bi–directional dial environment. Naming the MP bundle using the endpoint discriminator is useful in situations in which the clients are not authenticated by username.

```
bobslake-nas-01(config)#multilink bundle-name endpoint
```

The **endpoint** keyword reverses the naming order from the default **authenticated** keyword naming order.

The Multilink PPP bundle name is created with use of one of these options:

- The endpoint discriminator of the clients.
- The authenticated name if no endpoint discriminator is supplied.
- The caller ID if neither the authenticated name nor the endpoint is supplied.

Use of the both Keyword

Use the **both** keyword to name the bundle with both the authenticated username and the endpoint discriminator. This option can support multiple clients that use the same authentication username since the bundle name includes both the client username and endpoint discriminator. Since this option displays the username and endpoint discriminator of the client, it provides a quick reference to the username that the multilink clients use to connect to the NAS.

```
bobslake-nas-01(config)#multilink bundle-name both
```

The MP bundle name is created with use of one of these options:

- The authenticated name and the endpoint discriminator (for example, fred/myrouter).
- The authenticated name if no endpoint discriminator is supplied.
- The endpoint discriminator if the link is not authenticated.
- The caller ID if neither the authenticated name nor the endpoint discriminator is supplied.

show Output

Issue the **show ppp multilink** command to display information on multilink bundles that are active and to verify the multilink connection. Output examples of the **show ppp multilink** command for each of the keywords described above are displayed in this section.

Use of the multilink bundle–name authenticated Command

```
bobslake-nas-01#show ppp multilink

Virtual-Access3, bundle name is clearlake-lan-01

!--- Bundle name is the authenticated name of the user
```

```
!--- on the peer device.

  0 lost fragments, 0 reordered, 0 unassigned, sequence 0x2A/0x20 rcvd/sent
  0 discarded, 0 lost received, 1/255 load
  Member links: 2 (max not set, min not set)
    Async6
    Async8
```

Use of the multilink bundle–name endpoint Command

```
bobslake-nas-01#show ppp multilink

Virtual-Access1, bundle name is
d04120c1c653f603144321c191370000

!--- Bundle name is the endpoint discriminator
!--- as determined by the peer device.

  0 lost fragments, 0 reordered, 0 unassigned, sequence 0x7/0x0 rcvd/sent
  0 discarded, 0 lost received, 1/255 load
  Member links: 1 (max not set, min not set)
    Async36
Virtual-Access2, bundle name is clearlake-lan-01

!--- Bundle name is the endpoint discriminator
!--- (which in this case is the same as the username).

  0 lost fragments, 0 reordered, 0 unassigned, sequence 0x0/0x0 rcvd/sent
  0 discarded, 0 lost received, 1/255 load
  Member links: 1 (max not set, min not set)
    Async30
```

Use of the multilink bundle–name both Command

```
bobslake-nas-01#show ppp multilink
Virtual-Access1, bundle name is
clearlake-lan-01/d04120c1faa0fb0364f01fc191370000

!--- Bundle name is both the authenticated username
!--- and the endpoint discriminator.

  0 lost fragments, 0 reordered, 0 unassigned, sequence 0x26/0x3B rcvd/sent
  0 discarded, 0 lost received, 1/255 load
  Member links: 2 (max not set, min not set)
    Async37
    Async39
Virtual-Access3, bundle name is clearlake-lan-01/clearlake-lan-01

!--- Bundle name is both the authenticated username
!--- and the endpoint discriminator.

  0 lost fragments, 0 reordered, 0 unassigned, sequence 0x0/0x0 rcvd/sent
  0 discarded, 0 lost received, 1/255 load
  Member links: 1 (max not set, min not set)
    Async33
```

Related Information

- **Multiple Multilink Bundles Between Routers**
- **PPP Technical Support**
- **Multilink PPP for DDR – Basic Configuration and Verification**
- **Router–to–Router Async Multilink PPP**

- **Async Multilink PPP Dialup from Microsoft Windows Clients**
- **Technical Support – Cisco Systems**

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