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## 简介

本文描述要求的配置步骤实现两个EHWIC-4SHDSL-EA模块之间的一背对背多速率对称高速的数字用户线(G.SHDSL)连接。

您必须配置连接和另一端的一端在中心局模式的在客户端前置设备(CPE)模式启动SHDSL connection。这种背对背SHDSL连接设定在园区网络内通常实现提供在两楼宇之间的 connectivity，不用需要对于在两DSL路由器之间的一个DSLAM。

## 先决条件

### 要求

Cisco 建议您了解以下主题：

- EHWIC-4SHDSL-EA模块
- 已修复ISR G2路由器类似C888EA-K9在CO和CPE模式的工作用Cisco IOS软件15.2(2)T2及以后版本。

### 使用的组件

本文档不限于特定的软件和硬件版本。

然而，使用以下设备，此设置被建立

- 两ISR Generation-2路由器(CISCO2901/K9)装载与IOS 15.4.3M2。
- 在两ISR G2路由器安装的两个EHWIC-4SHDSL-EA模块。
- ANSI/TIA/EIA-568-B电缆用在任一个末端的RJ-45连接器。

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

## 配置

### 配置

在此设置，我们以在他们安装的EHWIC-4SHDSL-EA模块使用相同的路由器。而名为**CPE\_Router**的设备在CPE模式，有配置的SHDSL控制器运行名为**CO\_Router**的设备在CO模式有配置的SHDSL控制器运行。

EHWIC-4SHDSL-EA模块可以为Ethernet in the First Mile (EFM)和异步传输模式(ATM)配置。本文解释如何设置在EFM和ATM模式的背对背SHDSL连接。

下面的示例显示如何设置在ATM模式的背对背SHDSL连接，

## ATM模式

我们能实现IP over ATM (IPoA)或PPP over ATM (PPPoA)解决方案，当配置背对背SHDSL连接时。

### 1. IP over ATM解决方案

CO路由器：

```
CO_Router#show running-config Building configuration...Current configuration : 1624
bytes!!version 15.4service configservice timestamps debug datetime msecservice timestamps log
datetime msecno service password-encryption!hostname CO_Router!boot-start-markerboot system
flash:c2900-universalk9-mz.SPA.154-3.M2.binboot-end-marker!!!no aaa new-model!!!ip cefno ipv6
cef!multilink bundle-name authenticated!!!cts logging verbose!!license udi pid
CISCO2901/K9 sn FGL1622241Nlicense boot module c2900 technology-package securityk9license boot
module c2900 technology-package datak9!redundancy!!!controller SHDSL 0/1/0 termination co dsl-
group 0 pairs 0, 1, 2, 3 m-pair!!!interface Embedded-Service-Engine0/0 no ip address
shutdown!interface GigabitEthernet0/0 ip address dhcp duplex auto speed auto!interface
GigabitEthernet0/1 no ip address shutdown duplex auto speed auto!interface ATM0/1/0 ip address
1.1.1.1 255.255.255.0 no atm ilmi-keepalive pvc 1/10 !!!ip forward-protocol nd!no ip http
serverno ip http secure-server!control-plane!!line con 0line aux 0line vty 0 4 login transport
input all!!endCO_Router#
```

CPE路由器：

```
CPE_Router#show running-config Building configuration...Current configuration : 1538
bytes!version 15.2service timestamps debug datetime msecservice timestamps log datetime msecno
service password-encryption!hostname CPE_Router!boot-start-markerboot-end-marker!!!no aaa new-
model!ip cef!!!no ipv6 cef!multilink bundle-name authenticated!!!voice-card 0!!!
!license udi pid CISCO2901/K9 sn FGL151625KNlicense boot module c2900 technology-package
securityk9license boot module c2900 technology-package uck9license boot module c2900 technology-
package datak9!!!redundancy!controller SHDSL 0/1/0 dsl-group 0 pairs 0, 1, 2, 3 m-pair
!!interface Embedded-Service-Engine0/0 no ip address shutdown!interface GigabitEthernet0/0 no ip
address shutdown duplex auto speed auto!interface GigabitEthernet0/1 ip address dhcp duplex auto
speed auto!interface ATM0/1/0 ip address 1.1.1.2 255.255.255.0 no atm ilmi-keepalive pvc 1/10
!!!ip forward-protocol nd!no ip http serverno ip http secure-server!!control-plane!!gatekeeper
shutdown!!!line con 0line aux 0line vty 0 4 login transport input all!endCPE_Router#
```

### 2. PPP over ATM解决方案

CO路由器：

```
CO_Router#show running-config Building configuration...Current configuration : 1779
bytes!!version 15.4service configservice timestamps debug datetime msecservice timestamps log
datetime msecno service password-encryption!hostname CO_Router!boot-start-markerboot system
flash:c2900-universalk9-mz.SPA.154-3.M2.binboot-end-marker!!!no aaa new-model!!ip cefno ipv6
cef!multilink bundle-name authenticated!!!cts logging verbose!!license udi pid
CISCO2901/K9 sn FGL1622241Nlicense boot module c2900 technology-package securityk9license boot
module c2900 technology-package datak9!redundancy!!!controller SHDSL 0/1/0 termination co dsl-
group 0 pairs 0, 1, 2, 3 m-pair!interface Embedded-Service-Engine0/0 no ip address
shutdown!interface GigabitEthernet0/0 ip address dhcp duplex auto speed auto!interface
```

```
GigabitEthernet0/1 no ip address shutdown duplex auto speed auto!interface ATM0/1/0 no ip address no atm ilmi-keepalive pvc 1/10 encapsulation aal5snap protocol ppp dialer dialer pool-member 1 !!interface Dialer1 ip address 1.1.1.1 255.255.255.0 encapsulation ppp dialer pool 1 dialer-group 1!!ip forward-protocol nd!no ip http serverno ip http secure-server!!!control-plane!!!line con 0line aux 0line vty 0 4 login transport input all!endCO_Router#
```

CPE路由器：

```
CPE_Router#show running-config Building configuration...Current configuration : 1693 bytes!version 15.2service timestamps debug datetime msecservice timestamps log datetime msecno service password-encryption!hostname CPE_Router!boot-start-markerboot-end-marker!!!no aaa new-model!ip cef!!no ipv6 cef!multilink bundle-name authenticated!! license udi pid CISCO2901/K9 sn FGL151625KNlicense boot module c2900 technology-package securityk9license boot module c2900 technology-package uck9license boot module c2900 technology-package datak9!!!redundancy!!controller SHDSL 0/1/0 dsl-group 0 pairs 0, 1, 2, 3 m-pair !interface Embedded-Service-Engine0/0 no ip address shutdown!interface GigabitEthernet0/0 no ip address shutdown duplex auto speed auto!interface GigabitEthernet0/1 ip address dhcp duplex auto speed auto!interface ATM0/1/0 no ip address no atm ilmi-keepalive pvc 1/10 encapsulation aal5snap protocol ppp dialer dialer pool-member 1 !!interface Dialer1 ip address 1.1.1.2 255.255.255.0 encapsulation ppp dialer pool 1 dialer-group 1!!ip forward-protocol nd!no ip http serverno ip http secure-server!control-plane!gatekeeper shutdown!line con 0line aux 0line vty 0 4 login transport input all!endCPE_Router#
```

### 3. 在ATM解决方案的PPPOE

CO路由器：

```
CO_Router#show running-configuration Building configuration...Current configuration : 2299 bytes!version 15.4service timestamps debug datetime msecservice timestamps log datetime msecno service password-encryption!hostname CO_Router!boot-start-markerboot-end-marker!no aaa new-model!username cisco password 0 cisco!redundancy!!controller SHDSL 0/1/0 termination co dsl-group 0 pairs 0, 1, 2, 3 m-pair !!bba-group pppoe global virtual-template 1!!interface Loopback0 ip address 10.1.1.1 255.255.255.255!interface Embedded-Service-Engine0/0 no ip address shutdown!interface GigabitEthernet0/0 no ip address shutdown duplex auto speed auto!interface GigabitEthernet0/1 no ip address shutdown duplex auto speed auto!!interface ATM0/1/0 no ip address no atm ilmi-keepalive!interface ATM0/1/0.1 point-to-point pvc 1/100 protocol pppoe group global !!interface Virtual-Template1 ip unnumbered Loopback0 ip mtu 1492 peer default ip address pool PPPOE!!ip local pool PPPOE 10.1.1.2 10.1.1.254!line con 0line aux 0line vty 0 4 login transport input allendCO_Router#
```

Verification:

```
CO_Router#show caller ip
```

Line Number	User	IP Address	Local Number	Remote in
<-> V1.1	-	10.1.1.2	-	-

```
CO_Router#
```

CPE路由器：

```
CPE_Router#show running-config Building configuration...Current configuration : 2554 bytes!!version 15.4service timestamps debug datetime msecservice timestamps log datetime msecno service password-encryption!hostname CPE_Router!boot-start-markerboot-end-marker!!!no aaa new-model!ip cefno ipv6 cef!multilink bundle-name authenticated!controller SHDSL 0/1/0dsl-group 0 pairs 0, 1, 2, 3 m-pair !!!interface Embedded-Service-Engine0/0 no ip address shutdown!interface GigabitEthernet0/0 ip address dhcp duplex auto speed auto!interface GigabitEthernet0/1 no ip address duplex auto speed auto!interface GigabitEthernet0/2 ip address dhcp duplex auto speed auto!interface ATM0/1/0 no ip address no atm ilmi-keepalive!interface ATM0/1/0.1 point-to-point pvc 1/100 pppoe-client dial-pool-number 1 !!interface Dialer1 ip address negotiated encapsulation ppp dialer pool 1 ppp chap hostname cisco ppp chap password 0 cisco!!!control-plane! ! line con 0line aux 0line vty 0 4 login transport input all!!endCPE_Router#
```

Verification:

```

CPE_Router#show ip interface brief
Interface                               IP-Address      OK? Method Status
ProtocolEmbedded-Service-Engine0/0 unassigned      YES NVRAM   administratively down down
ATM0/1/0                                unassigned      YES unset   up          ATM0/1/0.1
unassigned      YES unset   up          up          Dialer1      10.1.1.2
YES IPCP      up          up          Virtual-Access1 unassigned    YES unset
up          up          CPE_Router#

```

## EFM模式

我们能实现在以太网(IPoE)或PPP over Ethernet (PPPoE)解决方案的IP，当配置背对背SHDSL连接时。

### 1. 在以太网解决方案的IP

CO路由器：

```

CO_Router#show running-config Building configuration...Current configuration : 2194 bytes!! Last
configuration change at 14:56:53 UTC Thu Mar 10 2016!version 15.4service timestamps debug
datetime msecservice timestamps log datetime msecno service password-encryption!hostname
CO_Router!boot-start-markerboot system flash:c2900-universalk9-mz.SPA.154-3.M2.binboot-end-
marker!!ip cefno ipv6 cefmultilink bundle-name authenticated!!cts logging verbose!
!redundancy!!controller SHDSL 0/3/0 termination co mode efm dsl-group 0 pairs 0, 1, 2, 3 efm-
bond !!interface Embedded-Service-Engine0/0 no ip address shutdown!interface GigabitEthernet0/0
no ip address duplex auto speed auto!interface GigabitEthernet0/1 no ip address duplex auto
speed auto!!interface Ethernet0/3/0 ip address 1.1.1.1 255.255.255.252!! ip forward-
protocol nd!no ip http serverno ip http secure-server!!control-plane!gatekeeper shutdown!line
con 0line aux 0line vty 0 4 login transport input all!scheduler allocate 20000
1000!endCO_Router#

```

CPE路由器：

```

CPE_Router#show running-config Building configuration...Current configuration : 1646 bytes!!
Last configuration change at 14:50:55 UTC Thu Mar 10 2016!version 15.4service timestamps debug
datetime msecservice timestamps log datetime msecno service password-encryption!hostname
CPE_Router!boot-start-markerboot system flash:c2900-universalk9-mz.SPA.154-3.M2.binboot-end-
marker!!no aaa new-model!ip cefno ipv6 cef!multilink bundle-name authenticated! cts
logging verbose!redundancy!controller SHDSL 0/3/0 mode efm dsl-group 0 pairs 0, 1, 2, 3 efm-
bond !!interface Embedded-Service-Engine0/0 no ip address shutdown!interface GigabitEthernet0/0
ip address dhcp duplex auto speed auto!interface GigabitEthernet0/1 no ip address duplex auto
speed auto!interface Ethernet0/3/0 ip address 1.1.1.2 255.255.255.252!!ip forward-protocol nd!no
ip http serverno ip http secure-server!control-plane!line con 0line aux 0line vty 0 4 login
transport input all!scheduler allocate 20000 1000!endCPE_Router#

```

### 2. PPP over Ethernet解决方案

CO路由器：

```

CO_Router#show running-config Building configuration...Current configuration : 1851 bytes!! Last
configuration change at 15:00:06 UTC Thu Mar 10 2016!version 15.4service timestamps debug
datetime msecservice timestamps log datetime msecno service password-encryption!hostname
CO_Router!boot-start-markerboot system flash:c2900-universalk9-mz.SPA.154-3.M2.binboot-end-
marker!ip cefno ipv6 cef!multilink bundle-name authenticated! cts logging
verbose!controller SHDSL 0/3/0 mode efm dsl-group 0 pairs 0, 1, 2, 3 efm-bond !bba-group pppoe
global virtual-template 1!!interface Embedded-Service-Engine0/0 no ip address shutdown!interface
GigabitEthernet0/0 ip address dhcp duplex auto speed auto!interface GigabitEthernet0/1 no ip
address duplex auto speed auto!interface Ethernet0/3/0 ip address 1.1.1.2 255.255.255.252 pppoe
enable group global!interface Virtual-Template1 mtu 1492 ip unnumbered Ethernet0/3/0 peer
default ip address pool PPPOE!!ip local pool PPPOE 1.1.1.1!no ip http serverno ip http secure-
server!control-plane!line con 0line aux 0line vty 0 4 login transport input all!scheduler
allocate 20000 1000!endCO_Router#

```

## CPE路由器：

```
CPE_Router#show running-config Building configuration...Current configuration : 2310 bytes!!
Last configuration change at 15:10:04 UTC Thu Mar 10 2016!version 15.4service timestamps debug
datetime msecservice timestamps log datetime msecno service password-encryption!hostname
CPE_Router!boot-start-markerboot system flash:c2900-universalk9-mz.SPA.154-3.M2.binboot-end-
marker!!ip cefno ipv6 cefmultilink bundle-name authenticated!!!cts logging
verbose!!voice-card 0!!!!           !redundancy!controller SHDSL 0/3/0 termination co mode efm
dsl-group 0 pairs 0, 1, 2, 3 efm-bond !!!!!interface Embedded-Service-Engine0/0 no ip address
shutdown!interface GigabitEthernet0/0 no ip address duplex auto speed auto!interface
GigabitEthernet0/1 no ip address duplex auto speed auto!!interface Ethernet0/3/0 no ip address
pppoe enable group global pppoe-client dial-pool-number 1!interface Dialer1 ip address
negotiated encapsulation ppp dialer pool 1!ip forward-protocol nd!no ip http serverno ip http
secure-server!!!!control-plane! !gatekeeper shutdown!!!line con 0line aux 0line vty 0 4
login transport input all!scheduler allocate 20000 1000!endCPE_Router#
```

## [验证](#)

1.To验证路由器在中心局模式，使用以下**show**命令。“CO终端”线路在输出(在下面的示例的**粗体中**)表明路由器在CO模式。默认模式是CPE。某些输出没出现此处，为简要起见。

```
CO# show controllers shdSL 0/1/0
```

控制器SHDSL 0/1/0是UP

硬件是EHWIC-4SHDSL-EA，加快转速0在slot0， hwic slot 1

## CO终端

DFE固件版本：1.1-1.7.5\_\_002

<Output缩写的由于空间constraints>

2. 对于EFM模式，请使用**show controllers ethernet**命令验证。
3. 对于ATM模式，请使用**show controllers atm**命令验证。

4. 关于故障排除SHDSL连接的详细信息，参考[配置思科G.SHDSL在Cisco路由器的EFM/ATM EHWICs](#)。

5. PPP涉及的故障排除，参考的[Ppp故障排除流程图](#)。