

在CO-CPE設定中配置背靠背的G.SHDSL連線

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簡介

本檔案介紹在兩個EHWIC-4SHDSL-EA模組之間實作背對背多速率對稱高速數位使用者線路(G.SHDSL)連線所需的設定步驟。

您必須將連線的一端配置為中央辦公室(CO)模式，另一端配置為客戶端裝置(CPE)模式，才能建立SHDSL連線。這種背對背的SHDSL連線設定通常在園區網路中實現，以便在兩個建築物之間提供連線，而不需要在兩個DSL路由器之間設定數字使用者線接入複用器(DSLAM)。

必要條件

需求

思科建議您瞭解以下主題：

- EHWIC-4SHDSL-EA模組
- 固定整合式服務路由器(ISR)G2路由器 (如C888EA-K9) 在CO和CPE模式下與Cisco IOS®軟體15.2(2)T2和更新版本配合使用

採用元件

本文件所述內容不限於特定軟體和硬體版本。

但是，使用以下裝置構建設定：

- 兩台裝有Cisco IOS® 15.4.3M2的ISR第2代路由器(CISCO2901/K9)
- 兩台ISR G2路由器上都安裝了兩個EHWIC-4SHDSL-EA模組
- ANSI/TIA/EIA-568-B電纜，兩端均帶有RJ-45聯結器

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除(預設)的組態來啟動。如果您的網路正在作用，請確保您已瞭解任何指令可能造成的影響。

設定

在此設定中，您將使用安裝有EHWIC-4SHDSL-EA模組的相同路由器。名為**CO_Router**的裝置配置了SHDSL控制器，以便在CO模式下運行；而名為**CPE_Router**的裝置配置了SHDSL控制器，以便在CPE模式下運行。

EHWIC-4SHDSL-EA模組可設定為在第一哩(EFM)和非同步傳輸模式(ATM)下的乙太網路。本文說明如何在EFM和ATM模式下建立背對背SHDSL連線。

此處的示例說明如何在ATM模式下建立背靠背SHDSL連線。

ATM模式

設定背對背SHDSL連線時，您可以實作IP over ATM(IPoA)或PPP over ATM(PPPoA)解決方案。

1. IPoA解決方案

- CO路由器：

```
CO_Router#show running-config
Building configuration...

Current configuration : 1624 bytes
!
!
version 15.4
service config
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname CO_Router
!
boot-start-marker
boot system flash:c2900-universalk9-mz.SPA.154-3.M2.bin
boot-end-marker
!
!
!
no aaa new-model
!
!
!
ip cef
no ipv6 cef
!
multilink bundle-name authenticated
!
!
!
cts logging verbose
!
!
license udi pid CISCO2901/K9 sn FGL1622241N
license boot module c2900 technology-package securityk9
```

```

license 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 server
no ip http secure-server
!

control-plane
!
!
line con 0
line aux 0
line vty 0 4
  login
  transport input all
!
!
end

```

CO_Router#

- CPE路由器 :

```

CPE_Router#show running-config
Building configuration...

```

Current configuration : 1538 bytes

```
!  
version 15.2  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname CPE_Router  
!  
boot-start-marker  
boot-end-marker  
!  
!  
no aaa new-model  
!  
ip cef  
!  
!  
no ipv6 cef  
!  
multilink bundle-name authenticated  
!  
!  
voice-card 0  
!  
!  
license udi pid CISCO2901/K9 sn FGL151625KN  
license boot module c2900 technology-package securityk9  
license boot module c2900 technology-package uck9  
license 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 server  
no ip http secure-server  
!  
!  
control-plane  
!  
!  
gatekeeper  
  shutdown  
!  
!  
!  
line con 0  
line aux 0  
line vty 0 4  
  login  
  transport input all  
  
!  
end
```

CPE_Router#

2. PPPoA解決方案

- CO路由器：

CO_Router#show running-config

Building configuration...

Current configuration : 1779 bytes

```
!  
!  
version 15.4  
service config  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname CO_Router  
!  
boot-start-marker  
boot system flash:c2900-universalk9-mz.SPA.154-3.M2.bin  
boot-end-marker  
!  
!  
!  
no aaa new-model  
!  
!  
ip cef
```

```
no ipv6 cef
!
multilink bundle-name authenticated
!
!
!
cts logging verbose
!
!
license udi pid CISCO2901/K9 sn FGL1622241N
license boot module c2900 technology-package securityk9
license 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 server
no ip http secure-server
!

!
!
control-plane
!
!
```

```
!  
line con 0  
line aux 0  
line vty 0 4  
  login  
  transport input all
```

```
!  
end
```

CO_Router#

• CPE路由器 :

CPE_Router#show running-config

Building configuration...

Current configuration : 1693 bytes

```
!  
  
version 15.2  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname CPE_Router  
!  
boot-start-marker  
boot-end-marker  
!  
!  
no aaa new-model  
!  
ip cef  
!  
  
!  
no ipv6 cef  
!  
multilink bundle-name authenticated  
!  
  
!  
!  
license udi pid CISCO2901/K9 sn FGL151625KN  
license boot module c2900 technology-package securityk9  
license boot module c2900 technology-package uck9  
license 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 server
no ip http secure-server
!
control-plane
!
gatekeeper
shutdown
!
line con 0
line aux 0
line vty 0 4
login
transport input all

!
end

```

CPE_Router#

3.使用ATM的PPPoE解决方案

- CO路由器 :

```

CO_Router#show running-configuration
Building configuration...

```

```

Current configuration : 2299 bytes
!

```

```

version 15.4
service timestamps debug datetime msec

```



```
service timestamps log datetime msec
no service password-encryption
!
hostname CO_Router
!
boot-start-marker
boot-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 0  
line aux 0  
line vty 0 4  
  login  
  transport input all  
  
end
```

CO_Router#

Verification:

CO_Router#show caller ip

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

CO_Router#

- CPE路由器 :

CPE_Router#show running-config

Building configuration...

Current configuration : 2554 bytes

```
!  
!  
version 15.4  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname CPE_Router  
!  
boot-start-marker  
boot-end-marker  
!  
!  
no aaa new-model  
!  
  
ip cef  
no ipv6 cef  
!  
multilink bundle-name authenticated  
!  
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  
  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 0
line aux 0
line vty 0 4
  login
  transport input all
!
!
end

```

CPE_Router#

Verification:

CPE_Router#show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
Embedded-Service-Engine0/0	unassigned	YES	NVRAM	administratively down	down
ATM0/1/0	unassigned	YES	unset	up	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

配置背對背的SHDSL連線時，可以實施IPoE或PPPoE解決方案。

1. IPoE解決方案

• 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 15.4  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname CO_Router  
!  
boot-start-marker  
boot system flash:c2900-universalk9-mz.SPA.154-3.M2.bin  
boot-end-marker  
!  
  
!  
ip cef  
no ipv6 cef  
multilink 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 server  
no ip http secure-server  
!  
  
!  
control-plane  
!  
  
gatekeeper  
  shutdown  
!  
  
line con 0  
line aux 0  
line vty 0 4  
  login  
  transport input all  
!  
scheduler allocate 20000 1000  
!  
end
```

CO_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 15.4  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname CPE_Router  
!  
boot-start-marker  
boot system flash:c2900-universalk9-mz.SPA.154-3.M2.bin  
boot-end-marker  
!  
!  
no aaa new-model  
!  
  
ip cef  
no 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 server
no ip http secure-server
!

control-plane
!

line con 0
line aux 0
line vty 0 4
  login
  transport input all
!
scheduler allocate 20000 1000
!
end

```

CPE_Router#

2. PPPoE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 15.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption

```
!  
hostname CO_Router  
!  
boot-start-marker  
boot system flash:c2900-universalk9-mz.SPA.154-3.M2.bin  
boot-end-marker  
!  
  
ip cef  
no 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 server  
no ip http secure-server  
!  
  
control-plane  
!  
  
line con 0  
line aux 0  
line vty 0 4  
login
```

```
transport input all
!  
scheduler allocate 20000 1000  
!  
end
```

CO_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 15.4  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname CPE_Router  
!  
boot-start-marker  
boot system flash:c2900-universalk9-mz.SPA.154-3.M2.bin  
boot-end-marker  
!  
!  
ip cef  
no ipv6 cef  
multilink 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 server
no ip http secure-server
!

!
!
!
!
control-plane
!
!
!
!
gatekeeper
shutdown
!
!
!
line con 0
line aux 0
line vty 0 4
login
transport input all
!
scheduler allocate 20000 1000
!
end

```

CPE_Router#

驗證

使用本節內容，確認您的組態是否正常運作。

1.若要確認路由器是否處於CO模式，請執行**show**命令。輸出中的CO終端行（示例中為粗體）表示

路由器處於CO模式。預設模式為CPE。為簡潔起見，此處未顯示部分輸出。

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

```
Controller SHDSL 0/1/0 is UP Hardware is EHWIC-4SHDSL-EA, rev 0 on slot 0, hwic slot 1  
Capabilities: EFM: 2-wire, EFM-Bond, Annex A, B, F & G ATM: 2-wire, Mpair, IMA, Annex A, B, F &  
G
```

- CO終止：

```
cdb=0x3CF085F0, plugin=0x21C33C1C, ds=0x21C33C68 base=0x10200000
```

```
FPGA Version is A14
```

```
NPU Source: System
```

```
NPU Firmware version: SHDSL_EA_FW_20130116053038
```

```
Vendor: Infineon, Chipset: SOCRATES-4e
```

```
PHY Source: System
```

```
IDC Firmware version: 1.7.5.0
```

```
DFE Firmware version: 1.1-1.7.5__002
```

```
Firmware reload mode: Auto
```

<Output abbreviated due to space constraints>

2.在EFM模式下，運行**show controllers ethernet**命令進行驗證。

3.在ATM模式中，執行**show controllers atm**命令以進行驗證。

疑難排解

目前尚無適用於此組態的具體疑難排解資訊。

相關資訊

- 有關排除SHDSL連線故障的詳細資訊，請參閱[在Cisco路由器中配置Cisco G.SHDSL EFM/ATM EHWIC](#)
- 有關PPP相關的故障排除，請參閱[PPP故障排除流程圖](#)
- [技術支援與文件 - Cisco Systems](#)