在CO-CPE设置中配置背对背G.SHDSL连接

目录

简介

本文档介绍在两个EHWIC-4SHDSL-EA模块之间实施背对背多速率对称高速数字用户线路(G.SHDSL)连接所需的配置步骤。

您必须在中心办公室(CO)模式下配置连接的一端，在客户端设备(CPE)模式下配置连接的另一端，以启用SHDSL连接。这种背对背SHDSL连接设置通常在园区网络中实现，以便在两栋建筑之间提供连接，而无需在两个DSL路由器之间设置数字用户线路接入复用器(DSLAM)。

先决条件

要求

Cisco 建议您了解以下主题：

- EHWIC-4SHDSL-EA模块
- 固定集成多业务路由器(ISR)G2路由器（如C888EA-K9）在Cisco IOS®软件15.2(2)T2及更高版本的CO和CPE模式下均可工作

使用的组件

本文档不限于特定的软件和硬件版本。

但是，设置是使用以下设备构建的：

- 加载了Cisco IOS® 15.4.3M2的两台ISR第2代路由器(CISCO2901/K9)
- 两台ISR G2路由器上都安装了两个EHWIC-4SHDSL-EA模块
- ANSI/TIA/EIA-568-B电缆，两端均带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

在此设置中，您将使用安装了EHWIC-4SHDSL-EA模块的相同路由器。名为**CO_Router的**设备配置了SHDSL控制器以在CO模式下运行，而名为**CPE_Router的**设备配置了SHDSL控制器以在CPE模式下运行。

EHWIC-4SHDSL-EA模块可以配置为第一英里(EFM)以太网和异步传输模式(ATM)以太网。 本文档说明如何在EFM和ATM模式下设置背对背SHDSL连接。

此处的示例显示如何在ATM模式下设置背对背SHDSL连接。

ATM模式

在配置背对背SHDSL连接时，可以实施IP over ATM(IPoA)或PPP over ATM(PPPoA)解决方案。

1. IPoA解决方案

- 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解决方案

- 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.基于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   <->
  Vi1.1           -           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

在配置背对背SHDSL连接时，可以实施IPoE或PPPoE解决方案。

1. IPoE解决方案

- 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#
```

验证

使用本部分可确认配置能否正常运行。

1.要验证路由器是否处于CO模式,请运行**show**命令。输出中的CO终止行(示例中粗体)表示路由

器处于CO模式。默认模式为CPE。为简单起见，有些输出不显示在此处。

```
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终止：

```
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.对于EFM模式，请运行**show controllers ethernet**命令进行验证。

3.对于ATM模式，请运行**show controllers atm**命令进行验证。

故障排除

目前没有针对此配置的故障排除信息。

相关信息

- 有关排除SHDSL连接故障的详细信息，请**参阅在Cisco路由器中配置Cisco G.SHDSL EFM/ATM EHWIC**
- 有关PPP相关故障排除，请参阅PPP故**障排除流程图**
- **技术支持和文档 - Cisco Systems**