

Configuración de la conexión G.SHDSL trasera en la configuración CO-CPE

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Introducción

Este documento describe los pasos de configuración necesarios para implementar una conexión de línea de suscriptor digital multimétrica (G.SHDSL) adosada entre dos módulos EHWIC-4SHDSL-EA.

Debe configurar un extremo de la conexión en el modo de oficina central (CO) y el otro extremo en el modo de equipo de las instalaciones del cliente (CPE) para activar la conexión SHDSL. Este tipo de conexión SHDSL adosada se implementa comúnmente dentro de una red de campus para proporcionar la conectividad entre dos edificios sin la necesidad de un Multiplexor de acceso de línea de suscriptor digital (DSLAM) entre los dos routers DSL.

Prerequisites

Requirements

Cisco recomienda que tenga conocimiento sobre estos temas:

- módulo EHWIC-4SHDSL-EA
- Los routers G2 con router de servicio integrado fijo (ISR), como C888EA-K9, funcionan tanto en los modos CO como CPE con el software Cisco IOS® 15.2(2)T2 y versiones posteriores

Componentes Utilizados

Este documento no tiene restricciones específicas en cuanto a versiones de software y de hardware.

Sin embargo, la configuración se ha creado con estos dispositivos:

- Dos routers ISR Generation-2 (CISCO2901/K9) cargados con Cisco IOS® 15.4.3M2
- Dos módulos EHWIC-4SHDSL-EA instalados en ambos routers ISR G2
- Cable ANSI/TIA/EIA-568-B con conectores RJ-45 en ambos extremos

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.

Configurar

En esta configuración, utilizará routers idénticos con módulos EHWIC-4SHDSL-EA instalados en ellos. El dispositivo denominado **CO_Router** tiene el controlador SHDSL configurado para funcionar en modo CO, mientras que el dispositivo denominado **CPE_Router** tiene el controlador SHDSL configurado para funcionar en modo CPE.

El módulo EHWIC-4SHDSL-EA se puede configurar tanto para Ethernet en la primera milla (EFM) como para el modo de transferencia asíncrona (ATM). Este documento explica cómo configurar la conexión SHDSL adosada en los modos EFM y ATM.

El ejemplo aquí muestra cómo configurar la conexión SHDSL adosada en el modo ATM.

Modo ATM

Puede implementar la solución IP sobre ATM (IPoA) o PPP sobre ATM (PPPoA) cuando configure la conexión SHDSL adosada.

1. Solución IPoA

- Router CO:

```
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#

- Router CPE:

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. Solución PPPoA

- Router CO:

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#

- Router CPE:

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. Solución PPPoE sobre ATM

- Router CO:

```
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#

- Router CPE:

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#

Modo EFM

Puede implementar la solución IPoE o PPPoE cuando configure la conexión SHDSL adosada.

1. Solución IPoE

- Router CO:

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#

- Router CPE:

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. Solución PPPoE

- Router CO:

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#

- Router CPE:

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
!
```

```
CPE_Router#
```

Verificación

Utilice esta sección para confirmar que su configuración funcione correctamente.

1. Para verificar que el router está en el modo CO, ejecute el comando **show**. La línea de terminación CO en el resultado (negrita en el ejemplo) indica que el router está en modo CO. El modo predeterminado sería CPE. Parte del resultado no aparece aquí, para ser breves.

```
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
```

- terminación CO:

```
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. Para el modo EFM, ejecute el comando **show controllers ethernet** para la verificación.

3. Para el modo ATM, ejecute el comando **show controllers atm** para la verificación.

Troubleshoot

Actualmente, no hay información específica de troubleshooting disponible para esta configuración.

Información Relacionada

- Para obtener información detallada sobre la resolución de problemas de conexiones SHDSL, consulte [Configuración de EHWICs EFM/ATM G.SHDSL de Cisco en Routers Cisco](#)

- Para la resolución de problemas relacionados con PPP, consulte el [diagrama de flujo de solución de problemas PPP](#)
- [Soporte Técnico y Documentación - Cisco Systems](#)