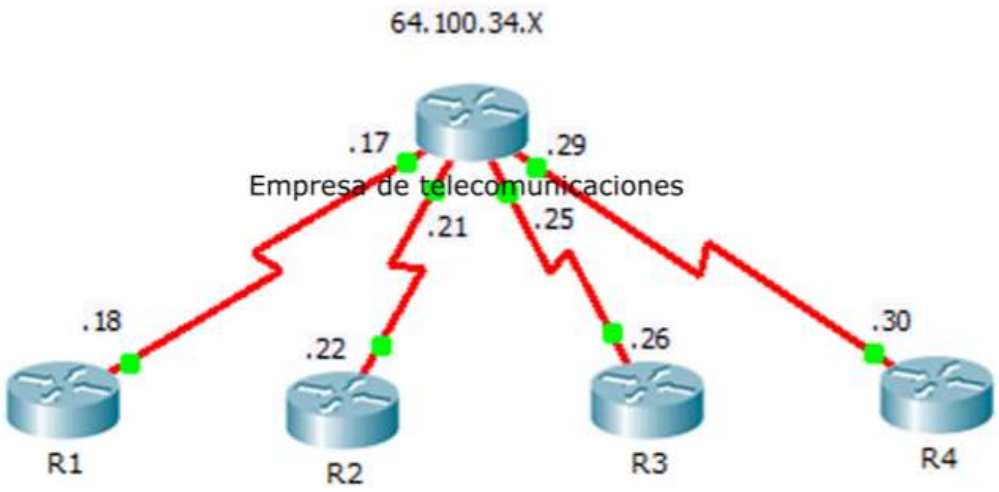
# Packet Tracer: Solución de problemas de interfaces seriales

## Topología




## Tabla de direccionamiento

| Dispositivo | Interfaz | Dirección IP | Máscara de subred | Ruta predeterminada |
|---|---|---|---|---|
| Empresa de telecomuni-caciones | S0/0/0 (DCE) | 64.100.34.17 | 255.255.255.252 | N/D |
| | S0/0/1 (DCE) | 64.100.34.21 | 255.255.255.252 | N/D |
| | S0/1/0 (DCE) | 64.100.34.25 | 255.255.255.252 | N/D |
| | S0/1/1 (DCE) | 64.100.34.29 | 255.255.255.252 | N/D |
| R1 | S0/0/0 | 64.100.34.18 | 255.255.255.252 | 64.100.34.17 |
| R2 | S0/0/1 | 64.100.34.22 | 255.255.255.252 | 64.100.34.21 |
| R3 | S0/0/0 | 64.100.34.26 | 255.255.255.252 | 64.100.34.25 |
| R4 | S0/0/1 | 64.100.34.30 | 255.255.255.252 | 64.100.34.29 |

## Objetivos

**Parte 1: Diagnosticar y reparar la capa física**

**Parte 2: Diagnosticar y reparar la capa de enlace de datos**

**Parte 3: Diagnosticar y reparar la capa de red**

## Situación

Se le ha solicitado solucionar los problemas de las conexiones WAN para una compañía telefónica local (**Telco**). El router de Telco se debe comunicar con cuatro sitios remotos, pero ninguno de estos funciona. Use sus conocimientos del modelo OSI y algunas reglas generales para identificar y reparar los errores en la red.

# Parte 1: Diagnosticar y reparar la capa física

## Paso 1: Diagnosticar y reparar el cableado.

a. Examine la tabla de direccionamiento para determinar la ubicación de las conexiones del DCE.

b. Cada conexión serial tiene un DCE y una conexión DTE. Para determinar si cada interfaz de **Telco** utiliza el extremo correcto del cable, mire la tercera línea de salida que sigue el comando **show controllers**.

```
Telco# show controllers [tipo_interfaz núm_interfaz]
```

c. Invierta los cables conectados de manera incorrecta.

**Nota**: En configuraciones de red real, el DCE (que establece la frecuencia de reloj) normalmente es un CSU/DSU.

```
Telco>enable
Telco#show controllers s0/0/0
Interface Serial0/0/0
Hardware is PowerQUICC MPC860
DCE V.35, clock rate 2000000
idb at 0x81081AC4, driver data structure at 0x81084AC0
SCC Registers:
General [GSMR]=0x2:0x00000000, Protocol-specific [PSMR]=0x8
Events [SCCE]=0x0000, Mask [SCCM]=0x0000, Status [SCCS]=0x00
Transmit on Demand [TODR]=0x0, Data Sync [DSR]=0x7E7E
Interrupt Registers:
Config [CICR]=0x00367F80, Pending [CIPR]=0x0000C000
Mask   [CIMR]=0x00200000, In-srv  [CISR]=0x00000000
Command register [CR]=0x580
Port A [PADIR]=0x1030, [PAPAR]=0xFFFF
       [PAODR]=0x0010, [PADAT]=0xCBFF
Port B [PBDIR]=0x09C0F, [PBPAR]=0x0800E
       [PBODR]=0x00000, [PBDAT]=0x3FFFD
Port C [PCDIR]=0x00C, [PCPAR]=0x200
       [PCSO]=0xC20,  [PCDAT]=0xDF2, [PCINT]=0x00F
Receive Ring
        rmd(68012830): status 9000 length 60C address 3B6DAC4
        rmd(68012838): status B000 length 60C address 3B6D444
Transmit Ring
```

```
Telco#show controllers s0/0/1
Interface Serial0/0/1
Hardware is PowerQUICC MPC860
DCE V.35, clock rate 4000000
idb at 0x81081AC4, driver data structure at 0x81084AC0
SCC Registers:
General [GSMR]=0x2:0x00000000, Protocol-specific [PSMR]=0x8
Events [SCCE]=0x0000, Mask [SCCM]=0x0000, Status [SCCS]=0x00
Transmit on Demand [TODR]=0x0, Data Sync [DSR]=0x7E7E
Interrupt Registers:
Config [CICR]=0x00367F80, Pending [CIPR]=0x0000C000
Mask   [CIMR]=0x00200000, In-srv  [CISR]=0x00000000
Command register [CR]=0x580
Port A [PADIR]=0x1030, [PAPAR]=0xFFFF
       [PAODR]=0x0010, [PADAT]=0xCBFF
Port B [PBDIR]=0x09C0F, [PBPAR]=0x0800E
       [PBODR]=0x00000, [PBDAT]=0x3FFFD
Port C [PCDIR]=0x00C, [PCPAR]=0x200
       [PCSO]=0xC20,  [PCDAT]=0xDF2, [PCINT]=0x00F
Receive Ring
        rmd(68012830): status 9000 length 60C address 3B6DAC4
        rmd(68012838): status B000 length 60C address 3B6D444
Transmit Ring
```

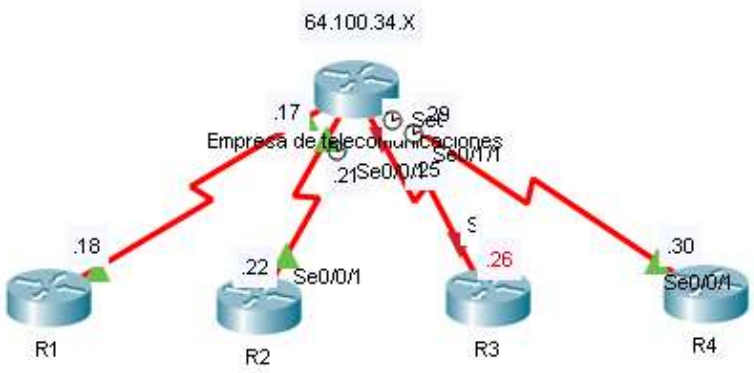
```
Telco#show controllers s0/1/0
Interface Serial0/1/0
Hardware is PowerQUICC MPC860
DCE V.35, clock rate 4000000
idb at 0x81081AC4, driver data structure at 0x81084AC0
SCC Registers:
General [GSMR]=0x2:0x00000000, Protocol-specific [PSMR]=0x8
Events [SCCE]=0x0000, Mask [SCCM]=0x0000, Status [SCCS]=0x00
Transmit on Demand [TODR]=0x0, Data Sync [DSR]=0x7E7E
Interrupt Registers:
Config [CICR]=0x00367F80, Pending [CIPR]=0x0000C000
Mask   [CIMR]=0x00200000, In-srv  [CISR]=0x00000000
Command register [CR]=0x580
Port A [PADIR]=0x1030, [PAPAR]=0xFFFF
       [PAODR]=0x0010, [PADAT]=0xCBFF
Port B [PBDIR]=0x09C0F, [PBPAR]=0x0800E
       [PBODR]=0x00000, [PBDAT]=0x3FFFD
Port C [PCDIR]=0x00C, [PCPAR]=0x200
       [PCSO]=0xC20,  [PCDAT]=0xDF2, [PCINT]=0x00F
Receive Ring
        rmd(68012830): status 9000 length 60C address 3B6DAC4
        rmd(68012838): status B000 length 60C address 3B6D444
Transmit Ring
```

```
Telco#show controllers s0/1/1
Interface Serial0/1/1
Hardware is PowerQUICC MPC860
DTE V.35 TX and RX clocks detected
idb at 0x81081AC4, driver data structure at 0x81084AC0
SCC Registers:
General [GSMR]=0x2:0x00000000, Protocol-specific [PSMR]=0x8
Events [SCCE]=0x0000, Mask [SCCM]=0x0000, Status [SCCS]=0x00
Transmit on Demand [TODR]=0x0, Data Sync [DSR]=0x7E7E
Interrupt Registers:
Config [CICR]=0x00367F80, Pending [CIPR]=0x0000C000
Mask   [CIMR]=0x00200000, In-srv  [CISR]=0x00000000
Command register [CR]=0x580
Port A [PADIR]=0x1030, [PAPAR]=0xFFFF
       [PAODR]=0x0010, [PADAT]=0xCBFF
Port B [PBDIR]=0x09C0F, [PBPAR]=0x0800E
       [PBODR]=0x00000, [PBDAT]=0x3FFFD
Port C [PCDIR]=0x00C, [PCPAR]=0x200
       [PCSO]=0xC20,  [PCDAT]=0xDF2, [PCINT]=0x00F
Receive Ring
        rmd(68012830): status 9000 length 60C address 3B6DAC4
        rmd(68012838): status B000 length 60C address 3B6D444
Transmit Ring
```

**Paso 2: Diagnosticar y reparar las conexiones de puerto incorrectas.**

a. Examine la tabla de direccionamiento para unir cada puerto de router con el puerto de **Telco** correcto.

b. Coloque el cursor sobre cada cable para asegurarse de que los cables estén conectados como se especifica. De lo contrario, corrija las conexiones.

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b. Coloque el cursor sobre cada cable para asegurarse de que los cables estén conectados como se especifica. De lo contrario, corrija las conexiones.

```
Telco>enable
Telco#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Serial0/0/0            64.100.34.17    YES manual up                    up
Serial0/0/1            64.100.34.21    YES manual up                    up
Serial0/1/0            64.100.34.25    YES manual down                  down
Serial0/1/1            64.100.34.29    YES manual up                    down
Vlan1                  unassigned      YES unset  administratively down down
Telco#
```

```
Telco#show interface s0/1/0
Serial0/1/0 is down, line protocol is down (disabled)
  Hardware is HD64570
  Internet address is 64.100.34.25/30
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 1158 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 output buffer failures, 0 output buffers swapped out
```

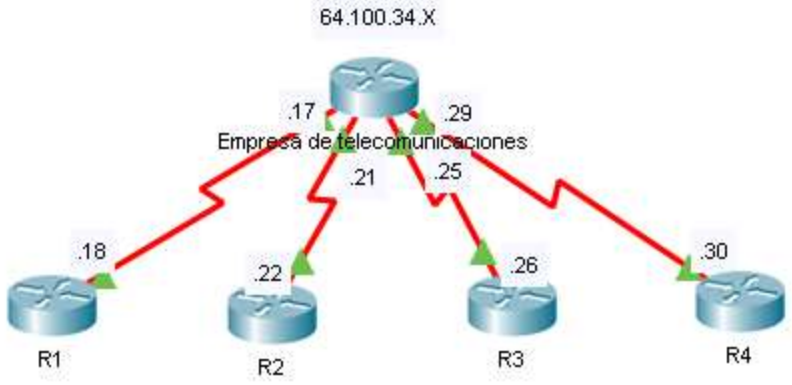
```
interface Serial0/1/0
 ip address 64.100.34.25 255.255.255.252
 clock rate 4000000
!
```

Aquí se muestra que la interface seria s0/1/0 ya se encuentra activa

```
R3#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#int s0/0/0
R3(config-if)#no shutdown

R3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
```




```
Telco#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Serial0/0/0            64.100.34.17    YES manual up                    up
Serial0/0/1            64.100.34.21    YES manual up                    up
Serial0/1/0            64.100.34.25    YES manual up                    up
Serial0/1/1            64.100.34.29    YES manual up                    down
Vlan1                  unassigned      YES unset  administratively down down
```

Aquí se muestra que las interfaces seriales ya están activas

## Parte 2: Diagnosticar y reparar la capa de enlace de datos

### Paso 1: Examinar y establecer las frecuencias de reloj en el equipo DCE.

a. Todos los cables del DCE deben estar conectados a **Telco**. Muestre la configuración en ejecución de **Telco** para verificar que se haya configurado una frecuencia de reloj en cada interfaz.

b. Establezca la frecuencia de reloj de cualquier interfaz serial que la requiera:

```
interface Serial0/0/0
 ip address 64.100.34.17 255.255.255.252
 clock rate 2000000
!
interface Serial0/0/1
 ip address 64.100.34.21 255.255.255.252
 clock rate 4000000
!
interface Serial0/1/0
 ip address 64.100.34.25 255.255.255.252
 clock rate 4000000
!
interface Serial0/1/1
 ip address 64.100.34.29 255.255.255.252
 clock rate 2000000
!
```

```
interface Serial0/0/0
 ip address 64.100.34.17 255.255.255.252
 clock rate 2000000
!
interface Serial0/0/1
 ip address 64.100.34.21 255.255.255.252
 clock rate 4000000
!
interface Serial0/1/0
 ip address 64.100.34.25 255.255.255.252
 clock rate 4000000
!
interface Serial0/1/1
 ip address 64.100.34.29 255.255.255.252
 clock rate 2000000
!
```

```
interface Serial0/0/0
 ip address 64.100.34.17 255.255.255.252
 clock rate 4000000
!
interface Serial0/0/1
 ip address 64.100.34.21 255.255.255.252
 clock rate 4000000
!
interface Serial0/1/0
 ip address 64.100.34.25 255.255.255.252
 clock rate 4000000
!
interface Serial0/1/1
 ip address 64.100.34.29 255.255.255.252
 clock rate 4000000
!
```

### Paso 2: Examinar la encapsulación en el equipo DCE.

a. Todas las interfaces seriales deben utilizar HDLC como el tipo de encapsulación. Examine la configuración del protocolo de las interfaces seriales.

```
Telco# show interface [tipo_interfaz núm_interfaz]
```

b. Cambie el tipo de encapsulación a HDLC para cualquier interfaz que se establezca de otra manera:

```
Telco#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Serial0/0/0            64.100.34.17    YES manual up                    up
Serial0/0/1            64.100.34.21    YES manual up                    up
Serial0/1/0            64.100.34.25    YES manual up                    up
Serial0/1/1            64.100.34.29    YES manual up                    down
Vlan1                  unassigned      YES unset  administratively down down

Telco#show interface s0/1/1
Serial0/1/1 is up, line protocol is down (disabled)
  Hardware is HD64570
  Internet address is 64.100.34.29/30
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
```

Cambiar la encapsulación de punto a punto por HDLC con el comando ***encapsulation hdlc***

```
R4>enable
R4#show interface s0/0/1
Serial0/0/1 is up, line protocol is down (disabled)
  Hardware is HD64570
  Internet address is 64.100.34.30/30
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation PPP, loopback not set, keepalive set (10 sec)

R4#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
R4(config)#int s0/0/1
R4(config-if)#encapsulation hdlc
R4(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

Telco#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Serial0/0/0            64.100.34.17    YES manual up                    up
Serial0/0/1            64.100.34.21    YES manual up                    up
Serial0/1/0            64.100.34.25    YES manual up                    up
Serial0/1/1            64.100.34.29    YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
```

## Parte 3: Diagnosticar y reparar la capa de red

### Paso 1: Verifique el direccionamiento IP.

a. Muestre un resumen breve de la interfaz de cada router. Verifique las direcciones IP según la tabla de asignación de direcciones y asegúrese de que estén en la subred correcta con su interfaz de conexión.

b. Corrija las direcciones IP que se superpongan, o que estén configuradas en el host o la dirección de difusión:

```
R1>enable
R1#show ip int brief
Interface              IP-Address      OK? Method Status                Protoco
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Serial0/0/0            64.100.34.17    YES manual up                    up
Serial0/0/1            unassigned      YES unset  down                  down
Vlan1                  unassigned      YES unset  administratively down down
```

## Packet Tracer: Solución de problemas de interfaces seriales

```
R1#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int s0/0/0
R1(config-if)#ip address 64.100.34.18 255.255.255.252
```

Se corrigen errores

### Paso 2: Verificar la conectividad entre todos los routers.

```
R2>enable
R2#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Serial0/0/0            unassigned      YES unset  administratively down down
Serial0/0/1            64.100.34.22    YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down

R3>enable
R3#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Serial0/0/0            64.100.34.26    YES manual up                    up
Serial0/0/1            unassigned      YES unset  down                  down
Vlan1                  unassigned      YES unset  administratively down down

R4>enable
R4#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Serial0/0/0            unassigned      YES unset  administratively down down
Serial0/0/1            64.100.34.30    YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
```