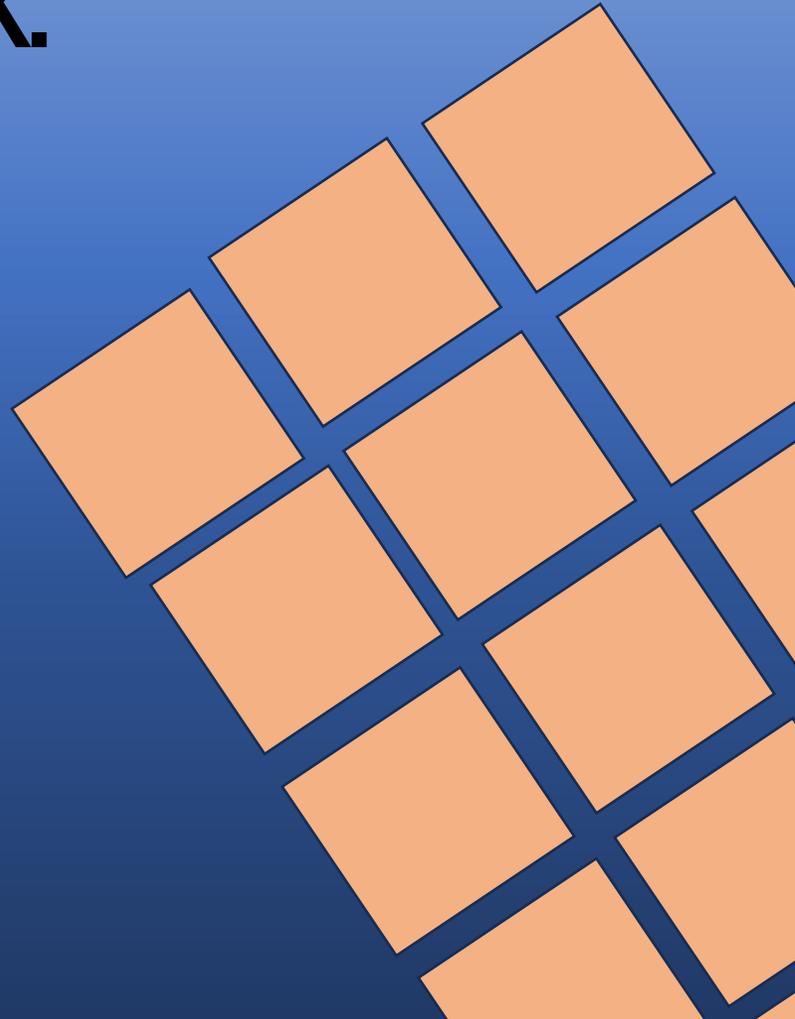


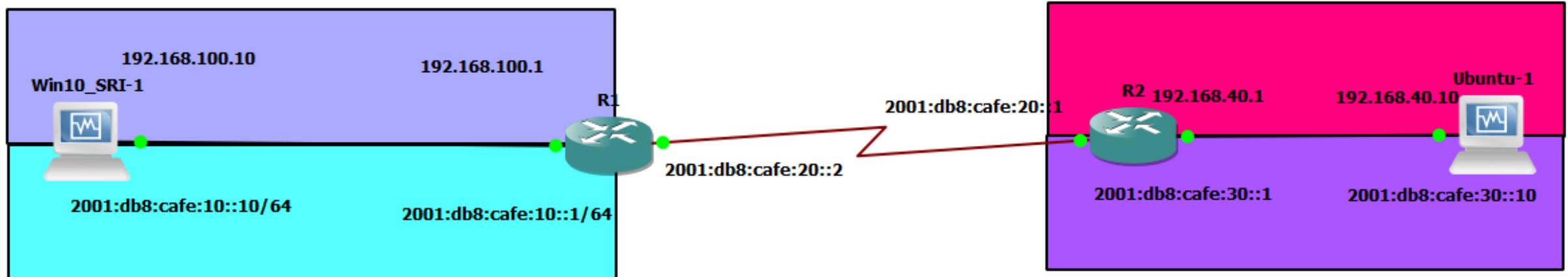
Tema 1 Practica 15 SRI: Implementación de Dual Stack: Un enfoque práctico para la transición IPv4 a IPv6

Miguel Lillo Romero 2º ASIR



Implementación de Dual Stack: Un enfoque práctico para la transición IPv4 a IPv6

Escenario



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Implementación de Dual Stack: Un enfoque práctico para la transición IPv4 a IPv6

Configuración del Router 1

```
R1
R2
R1(config)#interface FastEthernet0/0
R1(config-if)#ip address 192.168.100.1 255.255.255.0
R1(config-if)#ipv6 address 2001:db8:cafe:10::1/64
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#interface Se1/0
R1(config-if)#ipv6 address 2001:db8:cafe:20::2/64
R1(config-if)#ip address 192.168.30.2 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#ipv6 unicast-routing
R1(config)#ip route 192.168.40.0 255.255.255.0 Se1/0
R1(config)#ipv6 route 2001:db8:cafe:30::/64 Se1/0
R1(config)#
*Oct  2 20:04:52.867: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Oct  2 20:04:53.235: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
*Oct  2 20:04:53.867: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config)#
*Oct  2 20:04:54.247: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
R1(config)#
```

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Configuración del Router 2

```
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface FastEthernet0/0
R2(config-if)#ip address 192.168.40.1 255.255.255.0
R2(config-if)#ipv6 address 2001:db8:cafe:30::1/64
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#interface Se1/0
R2(config-if)#ipv6 address 2001:db8:cafe:20::1/64
R2(config-if)#ip address 192.168.30.1 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#ipv6 unicast-routing
R2(config)#ip route 192.168.100.0 255.255.255.0 Se1/0
R2(config)#ipv6 route 2001:db8:cafe:10::/64 Se1/0
R2(config)#do wr
```

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Configuración R1

```

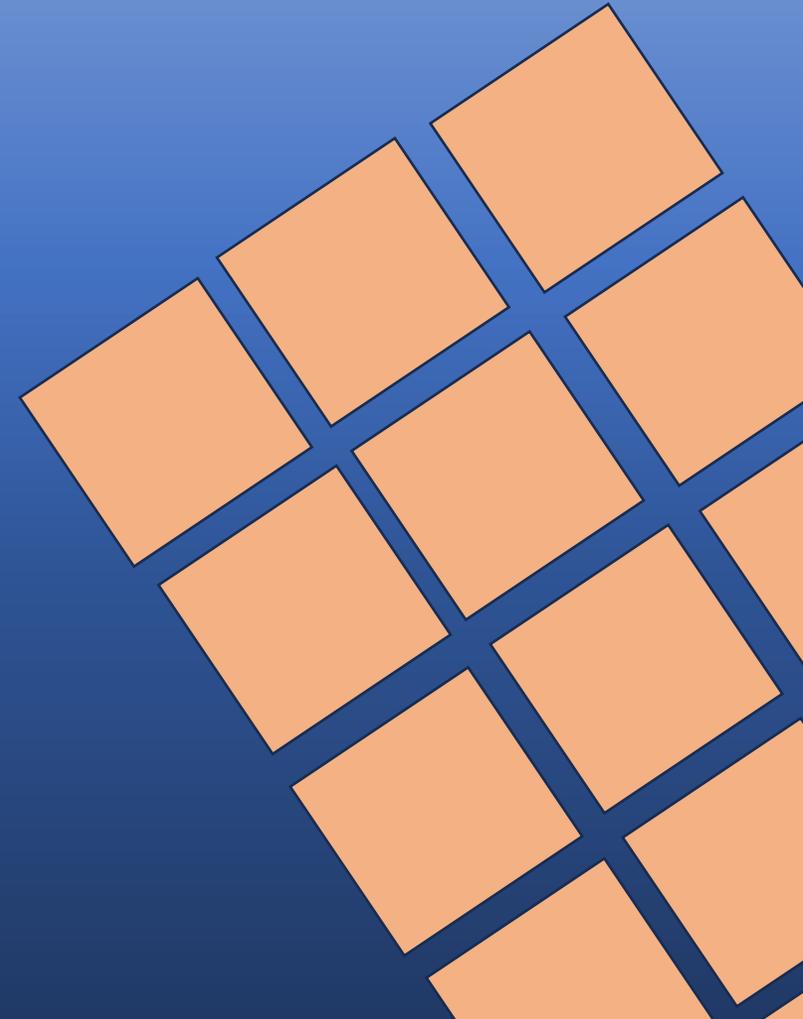
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

192.168.30.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.30.0/24 is directly connected, Serial1/0
L    192.168.30.2/32 is directly connected, Serial1/0
S    192.168.40.0/24 is directly connected, Serial1/0
192.168.100.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.100.0/24 is directly connected, FastEthernet0/0
L    192.168.100.1/32 is directly connected, FastEthernet0/0

R1#show ipv6 route
IPv6 Routing Table - default - 6 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
        B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP
        H - NHRP, I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea
        IS - ISIS summary, D - EIGRP, EX - EIGRP external, NM - NEMO
        ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
        O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
        ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, l - LISP
C 2001:DB8:CAFE:10::/64 [0/0]
   via FastEthernet0/0, directly connected
L 2001:DB8:CAFE:10::1/128 [0/0]
   via FastEthernet0/0, receive
C 2001:DB8:CAFE:20::/64 [0/0]
   via Serial1/0, directly connected
L 2001:DB8:CAFE:20::2/128 [0/0]
   via Serial1/0, receive
S 2001:DB8:CAFE:30::/64 [1/0]
   via Serial1/0, directly connected
L FF00::/8 [0/0]
   via Null0, receive

```



Implementación de Dual Stack: Un enfoque práctico para la transición IPv4 a IPv6

Configuración R2

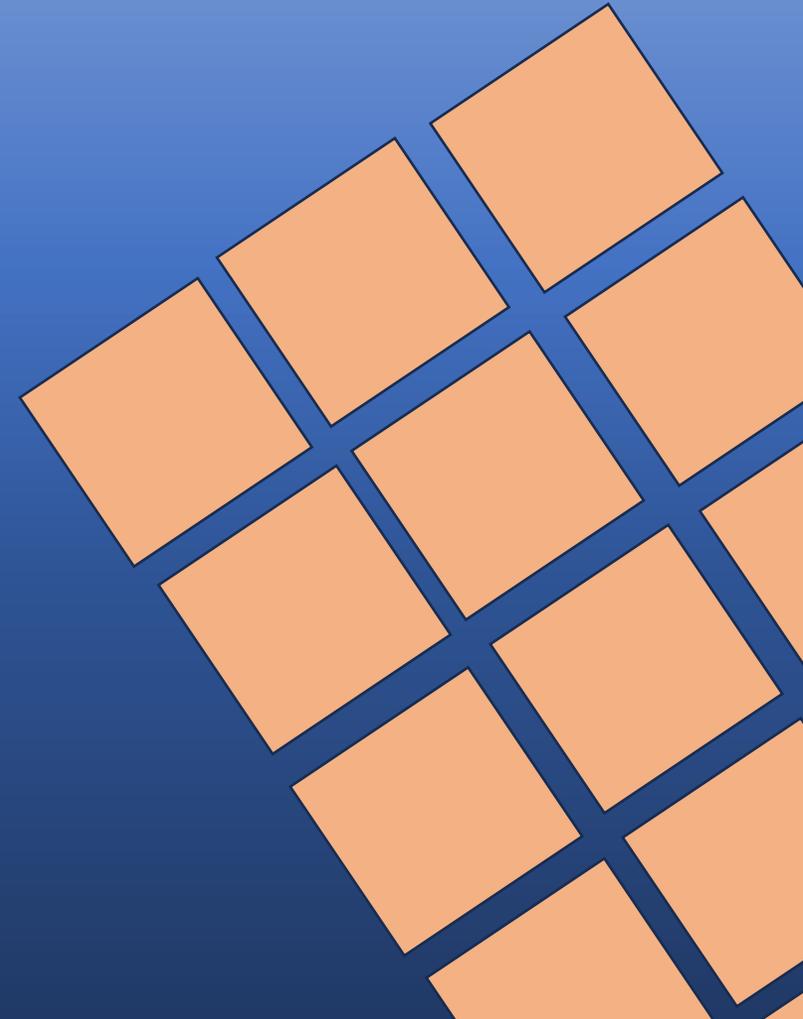
```

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

 192.168.30.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.30.0/24 is directly connected, Serial1/0
L    192.168.30.1/32 is directly connected, Serial1/0
 192.168.40.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.40.0/24 is directly connected, FastEthernet0/0
L    192.168.40.1/32 is directly connected, FastEthernet0/0
S    192.168.100.0/24 is directly connected, Serial1/0
R2#show ipv6 route
IPv6 Routing Table - default - 6 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP
H - NHRP, I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea
IS - ISIS summary, D - EIGRP, EX - EIGRP external, NM - NEMO
ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, l - LISP
S 2001:DB8:CAFE:10::/64 [1/0]
   via Serial1/0, directly connected
C 2001:DB8:CAFE:20::/64 [0/0]
   via Serial1/0, directly connected
L 2001:DB8:CAFE:20::1/128 [0/0]
   via Serial1/0, receive
C 2001:DB8:CAFE:30::/64 [0/0]
   via FastEthernet0/0, directly connected
L 2001:DB8:CAFE:30::1/128 [0/0]
   via FastEthernet0/0, receive
L FF00::/8 [0/0]
   via Null0, receive

```



Implementación de Dual Stack: Un enfoque práctico para la transición IPv4 a IPv6

Configuración R1

```

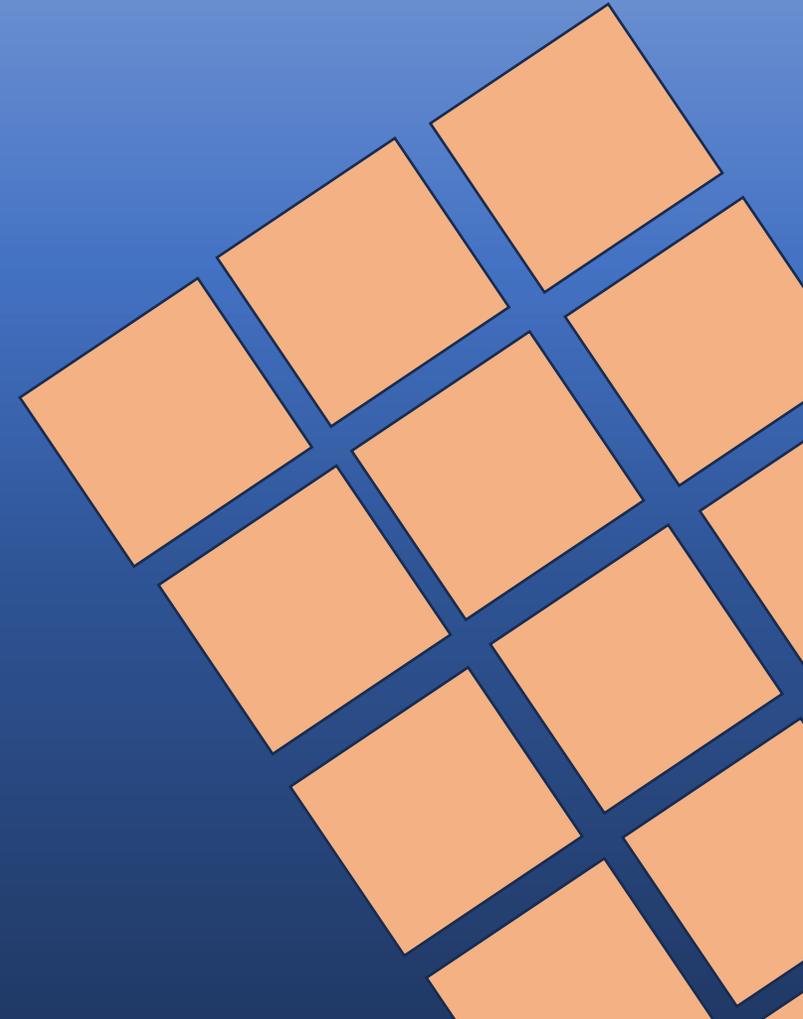
R1
interface FastEthernet0/0
 ip address 192.168.40.1 255.255.255.0
 duplex half
 ipv6 address 2001:DB8:CAFE:30::1/64
!
interface Serial1/0
 ip address 192.168.30.1 255.255.255.0
 ipv6 address 2001:DB8:CAFE:20::1/64
 serial restart-delay 0
!
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```

```

R2
ip route 192.168.100.0 255.255.255.0 Serial1/0
!
no cdp log mismatch duplex
ipv6 route 2001:DB8:CAFE:10::/64 Serial1/0
!
!
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```



Implementación de Dual Stack: Un enfoque práctico para la transición IPv4 a IPv6

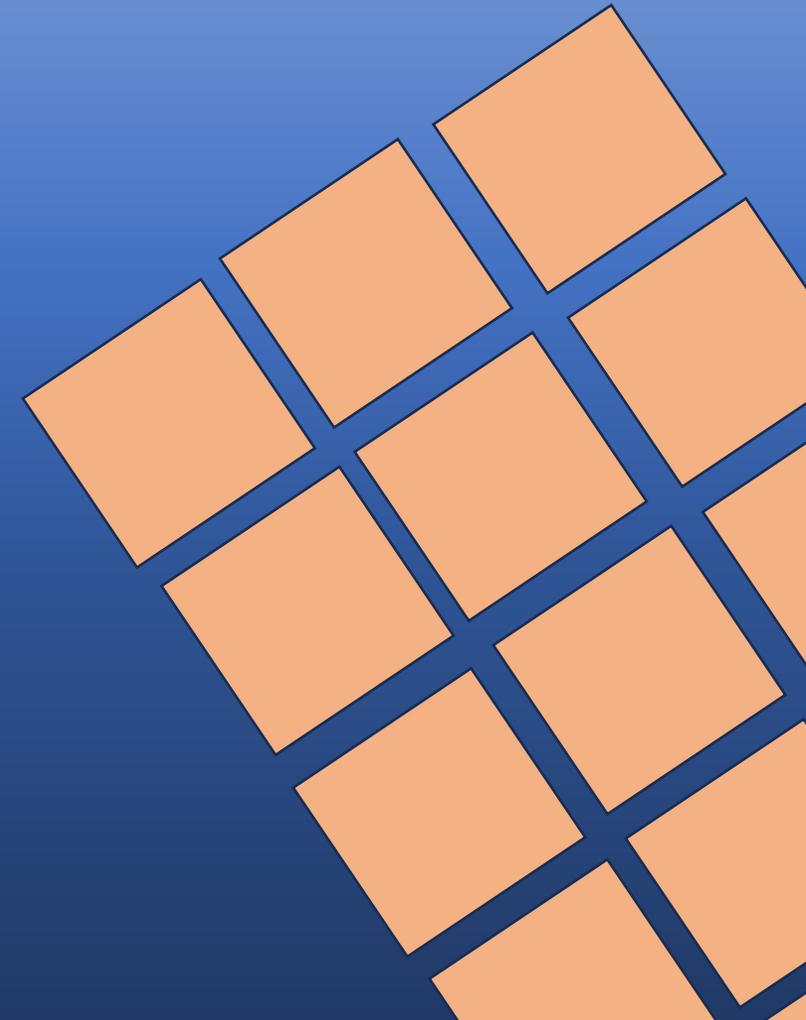
Configuración R1

```
⋮ R1 x R2 +
interface FastEthernet0/0
ip address 192.168.100.1 255.255.255.0
duplex half
ipv6 address 2001:DB8:CAFE:10::1/64
!
interface Serial1/0
ip address 192.168.30.2 255.255.255.0
ipv6 address 2001:DB8:CAFE:20::2/64
serial restart-delay 0
!
```

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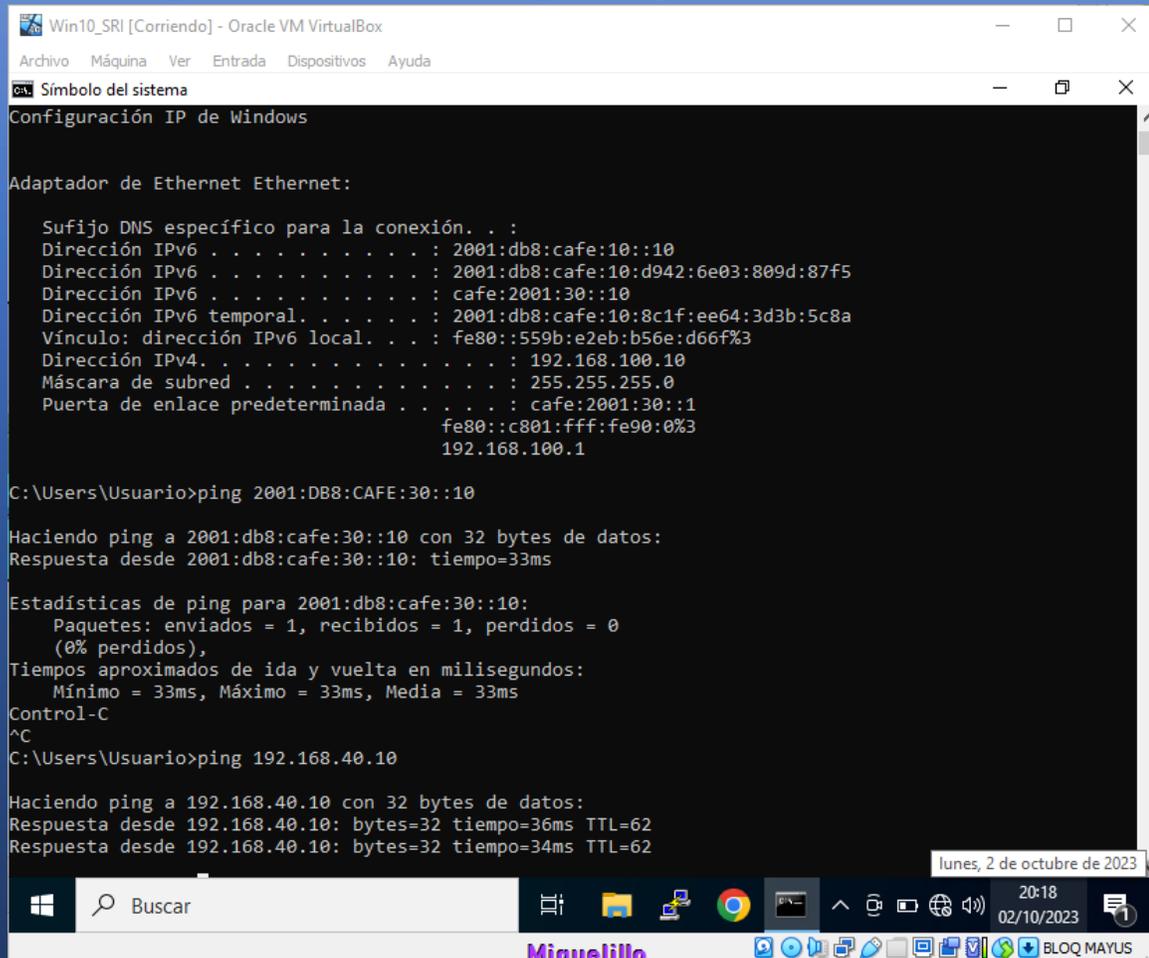
```
⋮ R1 x R2 +
!
ip route 192.168.40.0 255.255.255.0 Serial1/0
!
no cdp log mismatch duplex
ipv6 route 2001:DB8:CAFE:30::/64 Serial1/0
!
```

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Implementación de Dual Stack: Un enfoque práctico para la transición IPv4 a IPv6

Comprobación ping Windows



```
Win10_SRI [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
Símbolo del sistema
Configuración IP de Windows

Adaptador de Ethernet Ethernet:

Sufijo DNS específico para la conexión. . . :
Dirección IPv6 . . . . . : 2001:db8:cafe:10::10
Dirección IPv6 . . . . . : 2001:db8:cafe:10:d942:6e03:809d:87f5
Dirección IPv6 . . . . . : cafe:2001:30::10
Dirección IPv6 temporal. . . . . : 2001:db8:cafe:10:8c1f:ee64:3d3b:5c8a
Vínculo: dirección IPv6 local. . . . : fe80::559b:e2eb:b56e:d66f%3
Dirección IPv4. . . . . : 192.168.100.10
Máscara de subred . . . . . : 255.255.255.0
Puerta de enlace predeterminada . . . . : cafe:2001:30::1
                                           fe80::c801:fff:fe90:0%3
                                           192.168.100.1

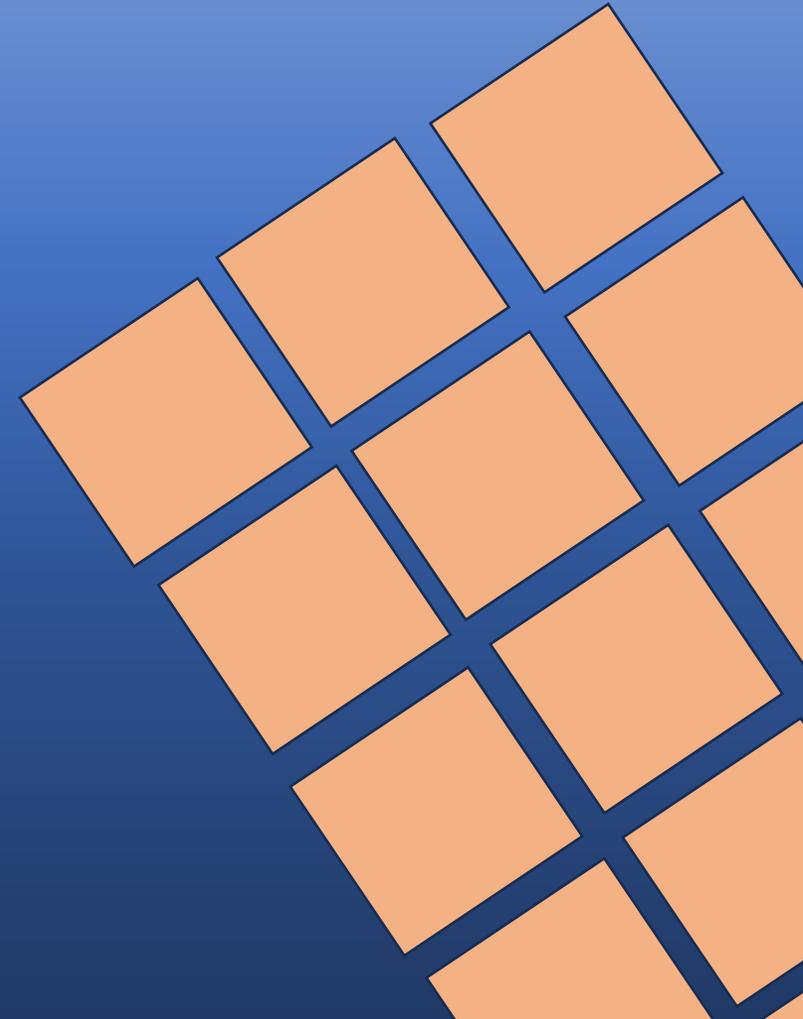
C:\Users\Usuario>ping 2001:DB8:CAFE:30::10

Haciendo ping a 2001:db8:cafe:30::10 con 32 bytes de datos:
Respuesta desde 2001:db8:cafe:30::10: tiempo=33ms

Estadísticas de ping para 2001:db8:cafe:30::10:
    Paquetes: enviados = 1, recibidos = 1, perdidos = 0
    (0% perdidos),
    Tiempos aproximados de ida y vuelta en milisegundos:
        Mínimo = 33ms, Máximo = 33ms, Media = 33ms
Control-C
^C
C:\Users\Usuario>ping 192.168.40.10

Haciendo ping a 192.168.40.10 con 32 bytes de datos:
Respuesta desde 192.168.40.10: bytes=32 tiempo=36ms TTL=62
Respuesta desde 192.168.40.10: bytes=32 tiempo=34ms TTL=62

lunes, 2 de octubre de 2023
20:18
02/10/2023
Miguelillo
BLOQ MAYUS
```



Implementación de Dual Stack: Un enfoque práctico para la transición IPv4 a IPv6

Comprobación ping Ubuntu

```
Ubuntu [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
Actividades Terminal 2 de oct 20:19 37%
usuario@usuario-miguel-SRI: ~
inet 127.0.0.1/8 scope host lo
  valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
  valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
  link/ether 08:00:27:6d:84:a8 brd ff:ff:ff:ff:ff:ff
  inet 192.168.40.10/24 brd 192.168.40.255 scope global noprefixroute enp0s3
    valid_lft forever preferred_lft forever
  inet6 2001:db8:cafe:30::10/64 scope global noprefixroute
    valid_lft forever preferred_lft forever
  inet6 fe80::9664:4e6c:fb04:98fb/64 scope link noprefixroute
    valid_lft forever preferred_lft forever
3: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
  link/ether 52:54:00:bb:f7:2c brd ff:ff:ff:ff:ff:ff
  inet 192.168.122.1/24 brd 192.168.122.255 scope global virbr0
    valid_lft forever preferred_lft forever
usuario@usuario-miguel-SRI:~$ ping 192.168.100.10
PING 192.168.100.10 (192.168.100.10) 56(84) bytes of data.
 64 bytes from 192.168.100.10: icmp_seq=1 ttl=126 time=40.4 ms
 64 bytes from 192.168.100.10: icmp_seq=2 ttl=126 time=38.0 ms
^C
--- 192.168.100.10 ping statistics ---
 2 packets transmitted, 2 received, 0% packet loss, time 1001ms
 rtt min/avg/max/mdev = 38.044/39.222/40.401/1.178 ms
usuario@usuario-miguel-SRI:~$ ping 2001:db8:cafe:10::10
PING 2001:db8:cafe:10::10(2001:db8:cafe:10::10) 56 data bytes
 64 bytes from 2001:db8:cafe:10::10: icmp_seq=1 ttl=62 time=53.6 ms
 64 bytes from 2001:db8:cafe:10::10: icmp_seq=2 ttl=62 time=36.5 ms
^C
--- 2001:db8:cafe:10::10 ping statistics ---
 2 packets transmitted, 2 received, 0% packet loss, time 1002ms
 rtt min/avg/max/mdev = 36.495/45.026/53.558/8.531 ms
usuario@usuario-miguel-SRI:~$
```

