

CCNA 3: SCALING NETWORKS

CASE STUDY (PACKET TRACER)

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Introducción

Contenido

Escenario

- A continuación de desarrollo un proyecto para poner en práctica todo lo aprendido durante el curso de CCNA 3 de cisco.
- el proyecto que nos fue asignado consiste en llevar a cabo la instalación de una infraestructura de red de una entidad.
- Desde el departamento de arquitectos hemos recibido algunos planos para comenzar las instalaciones.
- Nos han encargado comenzar la instalación y llevar a cabo todas las configuraciones necesarias.
- Hemos de documentar todos los apartados y seguir las necesidades que nos indica el cliente.

Hardware

Los equipos de red son fabricados por CISCO.

Cableado

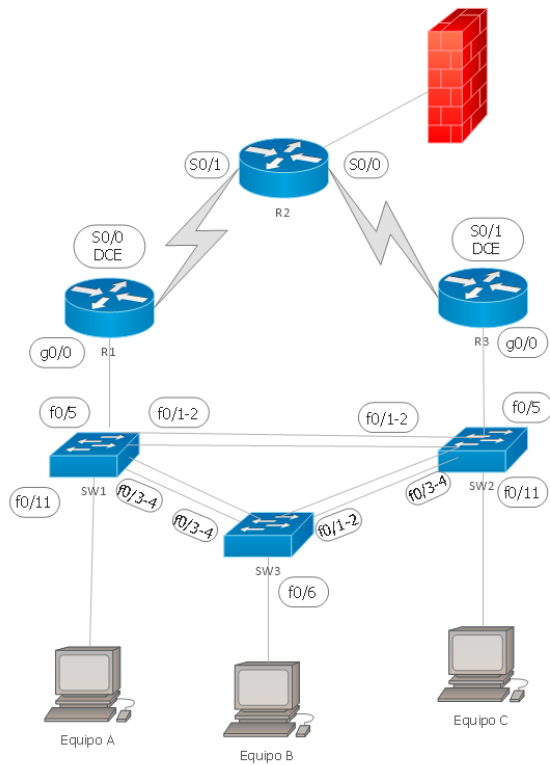
El cableado está a la elección de la empresa.

Equipos

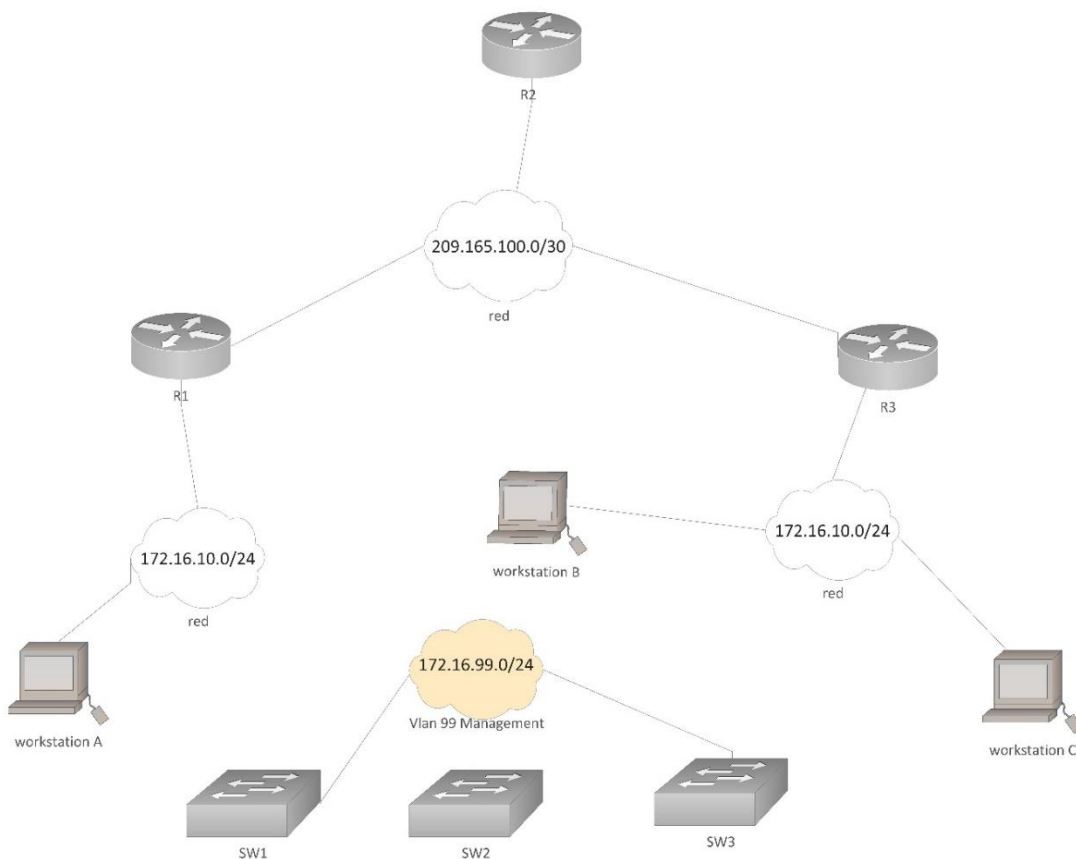
Los dispositivos finales a la elección de la empresa, la red ha de estar accesible por cable o sin cable.

Planificació

Esquema físic



Esquema lògic



Direccionamiento

Tabla correspondiente al direccionamiento

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	172.16.10.1	255.255.255.0	N/A
	S0/0	209.165.100.1	255.255.255.252	N/A
R2	S0/0	209.165.100.5	255.255.255.252	N/A
	S0/1	209.165.100.2	255.255.255.252	N/A
	Lo0	200.200.200.1	255.255.255.0	N/A
R3	G0/0	172.16.10.3	255.255.255.0	N/A
	S0/1	209.165.100.6	255.255.255.252	N/A
SW1	VLAN 99	172.16.99.11	255.255.255.0	N/A
SW2	VLAN 99	172.16.99.12	255.255.255.0	N/A
SW3	VLAN 99	172.16.99.13	255.255.255.0	N/A
PC1	NIC	172.16.10.11	255.255.255.0	172.16.10.2
PC2	NIC	172.16.10.12	255.255.255.0	172.16.10.4
PC3	NIC	172.16.10.13	255.255.255.0	172.16.10.4

Distribución de puertos físicos

Switch	Ports	Assignment	Network
SW1	Rango F0/1 - F0/4	802.1q Trunks (Native VLAN 99)	172.16.99.0/24
	Rango F0/5 - F0/16	VLAN 10 – Sales	172.16.10.0/24
SW2	Rango F0/1 - F0/4	802.1q Trunks (Native VLAN 99)	172.16.99.0/24
	Rango F0/5 - F0/16	VLAN 10 – Sales	172.16.10.0/24
SW3	Rango F0/1- F0/4	802.1q Trunks (Native VLAN 99)	172.16.99.0/24
	Rango F0/5 - F0/16	VLAN 10 – Sales	172.16.10.0/24

Información relativa de Vlan's

VLAN	VLAN Name
VLAN 99 (Native)	Management
VLAN 10	Sales

Configuraciones

Acceso a los dispositivos

Por razones de seguridad se han habilitado todos los controles de acceso a los dispositivos de red, a continuación, se muestran las credenciales de acceso:

Dispositivo	Nivel de acceso	Usuario	Password
Routers	Console	admin01	admin01pass
Switch's	Console	admin01	admin01pass
Routers	Privilegiado	-	ciscoenpa55
Switch's	Console	-	ciscoenpa55
Routers	Acceso remoto	adminSSH	adminSSHpass
Switch's	Acceso remoto	adminSSH	adminSSHpass

Configuraciones de Routers

A continuación se procede a realizar todas las configuraciones necesarias en los routers, desde las asignaciones de IP's, destinitos protocolos, hasta la verificación de la conectividad.

Después de haber acabado las configuraciones verificamos los resultados de cada apartado con las herramientas adecuadas.

Router 1

Especificaciones

R1# show cdp neighbors

```
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID Local Intrfce Holdtme Capability Platform Port ID
SW1 Gig 0/0 126 S 2960 Fas 0/5
R2 Ser 0/3/0 126 R C2900 Ser 0/3/1
```

R1#show ip interface brief

```
Interface IP-Address OK? Method Status Protocol
GigabitEthernet0/0 172.16.10.1 YES manual up up
GigabitEthernet0/1 unassigned YES unset administratively down down
GigabitEthernet0/2 unassigned YES unset administratively down down
Serial0/3/0 209.165.100.1 YES manual up up
Serial0/3/1 unassigned YES unset administratively down down
Vlan1 unassigned YES unset administratively down down
```

R1#show version

```
Cisco IOS Software, C2900 Software (C2900-UNIVERSALK9-M), Version 15.1(4)M4, RELEASE
SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2012 by Cisco Systems, Inc.
Compiled Thurs 5-Jan-12 15:41 by pt_team
...
License UDI:
```

```

Device# PID SN
-----
*0 CISC02911/K9 FTX1524IV7N-

Technology Package License Information for Module:'c2900'
-----
Technology Technology-package Technology-package
Current Type Next reboot
-----
ipbase ipbasek9 Permanent ipbasek9
security disable None None
uc disable None None
data disable None None
Configuration register is 0x2102

```

```

R1#show startup-config
Using 1406 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
security passwords min-length 10
!
hostname R1
enable secret 5 $1$mERr$TfFTxE.mmb505BVC56ndL0
no ip cef
no ipv6 cef
username admin01 password 7 0820484300175546020A1F17
username adminSSH password 7 08204843001736243A1B0D1739
!
license udi pid CISC02911/K9 sn FTX1524IV7N-
no ip domain-lookup
ip domain-name CCNA_CS3.com
spanning-tree mode pvst
interface GigabitEthernet0/0
description LAN 1
ip address 172.16.10.1 255.255.255.0
duplex auto
speed auto
standby version 2
standby 1 ip 172.16.10.2
standby preempt
standby 2 ip 172.16.10.4
!
interface GigabitEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface GigabitEthernet0/2
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/3/0
description link R1 --> R2

```

```

ip address 209.165.100.1 255.255.255.252
!
interface Serial0/3/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
ip classless
ip flow-export version 9
banner motd ^C
*****
This is the R1 CLI.
*****^C
line con 0
login local
!
line aux 0
!
line vty 0 4
login local
transport input ssh
line vty 5 15
login local
transport input ssh
End

```

R1#show standby

```

GigabitEthernet0/0 - Group 1 (version 2)
State is Standby
8 state changes, last state change 00:00:37
Virtual IP address is 172.16.10.2
Active virtual MAC address is 0000.0C9F.F001
Local virtual MAC address is 0000.0C9F.F001 (v2 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.833 secs
Preemption disabled
Active router is 172.16.10.3
Standby router is local
Priority 100 (default 100)
Group name is hsrp-Gig0/0-1 (default)
GigabitEthernet0/0 - Group 2 (version 2)
State is Standby
10 state changes, last state change 00:00:42
Virtual IP address is 172.16.10.4
Active virtual MAC address is 0000.0C9F.F002
Local virtual MAC address is 0000.0C9F.F002 (v2 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.345 secs
Preemption disabled
Active router is 172.16.10.3
Standby router is local
Priority 100 (default 100)
Group name is hsrp-Gig0/0-2 (default)

```

- show standby brief

R1#show standby brief

```

P indicates configured to preempt.
|

```



```

Interface Grp Pri P State Active Standby Virtual IP
Gig0/0 1 100 Standby 172.16.10.3 local 172.16.10.2
Gig0/0 2 100 Standby 172.16.10.3 local 172.16.10.4

```

Protocolo OSPF

R1#show ip route

```

172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 172.16.10.0/24 is directly connected, GigabitEthernet0/0
L 172.16.10.1/32 is directly connected, GigabitEthernet0/0
200.200.200.0/32 is subnetted, 1 subnets
O 200.200.200.1/32 [110/65] via 209.165.100.2, 00:00:15, Serial0/3/0
209.165.100.0/24 is variably subnetted, 3 subnets, 2 masks
C 209.165.100.0/30 is directly connected, Serial0/3/0
L 209.165.100.1/32 is directly connected, Serial0/3/0
O 209.165.100.4/30 [110/128] via 209.165.100.2, 00:00:15, Serial0/3/0

```

R1#show ip protocols

```

Routing Protocol is "ospf 10"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 1.1.1.1
Number of areas in this router is 2. 2 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
172.16.10.0 0.0.0.255 area 1
209.165.100.0 0.0.0.3 area 1
Routing Information Sources:
Gateway Distance Last Update
1.1.1.1 110 00:09:49
2.2.2.2 110 00:09:49
3.3.3.3 110 00:09:49
Distance: (default is 110)

```

R1#show ip ospf

```

Routing Process "ospf 10" with ID 1.1.1.1
Supports only single TOS(TOS0) routes
Supports opaque LSA
It is an area border router
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
Number of external LSA 0. Checksum Sum 0x000000
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 2. 2 normal 0 stub 0 nssa
External flood list length 0
Area 1
Number of interfaces in this area is 2
Area has no authentication
SPF algorithm executed 5 times
Area ranges are
Number of LSA 7. Checksum Sum 0x031364
Number of opaque link LSA 0. Checksum Sum 0x000000
Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0

```

R1#show ip ospf neighbor

```

Neighbor ID Pri State Dead Time Address Interface
3.3.3.3 1 FULL/DR 00:00:38 172.16.10.3 GigabitEthernet0/0
2.2.2.2 0 FULL/ - 00:00:19 209.165.100.2 Serial0/3/0
show ip ospf database

```

R1#show ip ospf database

```

OSPF Router with ID (1.1.1.1) (Process ID 10)
Router Link States (Area 0)
Link ID ADV Router Age Seq# Checksum Link count
1.1.1.1 1.1.1.1 703 0x80000003 0x009e5f 2
3.3.3.3 3.3.3.3 703 0x80000003 0x00a341 2
2.2.2.2 2.2.2.2 703 0x80000007 0x00031c 5

```

Summary Net Link States (Area 0)

```

Link ID ADV Router Age Seq# Checksum
172.16.10.0 1.1.1.1 709 0x80000001 0x00abfc
172.16.10.0 3.3.3.3 693 0x80000001 0x006f31

```

Summary ASB Link States (Area 0)

```

Link ID ADV Router Age Seq# Checksum
2.2.2.2 1.1.1.1 669 0x80000002 0x00818f

```

Router Link States (Area 1)

```

Link ID ADV Router Age Seq# Checksum Link count
1.1.1.1 1.1.1.1 670 0x80000004 0x00f4ae 2
3.3.3.3 3.3.3.3 670 0x80000003 0x0012a9 1

```

Net Link States (Area 1)

```

Link ID ADV Router Age Seq# Checksum
172.16.10.3 3.3.3.3 670 0x80000001 0x0038f7

```

Summary Net Link States (Area 1)

```

Link ID ADV Router Age Seq# Checksum
209.165.100.4 3.3.3.3 694 0x80000002 0x00b97b
200.200.200.1 3.3.3.3 694 0x80000003 0x007143
209.165.100.0 3.3.3.3 694 0x80000004 0x006096

```

Summary ASB Link States (Area 1)

```

Link ID ADV Router Age Seq# Checksum
2.2.2.2 3.3.3.3 694 0x80000001 0x0047c2

```

```

show ip ospf interface <interface>

```

R1#show ip ospf interface s0/3/0

```

Serial0/3/0 is up, line protocol is up
Internet address is 209.165.100.1/30, Area 0
Process ID 10, Router ID 1.1.1.1, Network Type POINT-TO-POINT, Cost: 64
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 5, Dead 20, Wait 20, Retransmit 5
Hello due in 00:00:02
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 2.2.2.2
Suppress hello for 0 neighbor(s)
Message digest authentication enabled
Youngest key id is 1
Serial0/3/0 is up, line protocol is up
Internet address is 209.165.100.1/30, Area 1
Process ID 10, Router ID 1.1.1.1, Network Type POINT-TO-POINT, Cost: 64
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 5, Dead 20, Wait 20, Retransmit 5

```

```

Hello due in 00:00:02
Index 3/3, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Suppress hello for 0 neighbor(s)
Message digest authentication enabled
Youngest key id is 1

```

```
show ip ospf interface brief (no lo suporta packet tracer)
```

Protocolo EIGRP

R1#show ip route

```

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
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, E - EGP
i - IS-IS, 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
Gateway of last resort is not set
172.16.0.0/16 is variably subnetted, 3 subnets, 3 masks
D 172.16.0.0/16 is a summary, 00:00:21, Null0
C 172.16.10.0/24 is directly connected, GigabitEthernet0/0
L 172.16.10.1/32 is directly connected, GigabitEthernet0/0
209.165.100.0/24 is variably subnetted, 3 subnets, 3 masks
D 209.165.100.0/24 is a summary, 00:00:21, Null0
C 209.165.100.0/30 is directly connected, Serial0/3/0
    • L 209.165.100.1/32 is directly connected, Serial0/3/0

```

R1#show ip protocols

```

Routing Protocol is "eigrp 20 "
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Default networks flagged in outgoing updates
Default networks accepted from incoming updates
Redistributing: eigrp 20
EIGRP-IPv4 Protocol for AS(20)
Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
NSF-aware route hold timer is 240
Router-ID: 1.1.1.1
Topology : 0 (base)
Active Timer: 3 min
Distance: internal 90 external 170
Maximum path: 4
Maximum hopcount 100
Maximum metric variance 1

```

```

Automatic Summarization: enabled
Automatic address summarization:
172.16.0.0/16 for Serial0/3/0
Summarizing with metric 5120
209.165.100.0/24 for GigabitEthernet0/0
Summarizing with metric 2169856
Maximum path: 4
Routing for Networks:
172.16.10.0/24
209.165.100.0/30
Routing Information Sources:
Gateway Distance Last Update
209.165.100.2 90 8369
172.16.10.3 90 33055
Distance: internal 90 external 170

```

```
show ip eigrp neighbors
```

```
R1#show ip eigrp neighbors
```

```
IP-EIGRP neighbors for process 20
H Address Interface Hold Uptime SRTT RTO Q Seq
(sec) (ms) Cnt Num
0 209.165.100.2 Se0/3/0 11 00:02:57 40 1000 0 3
1 172.16.10.3 Gig0/0 11 00:02:32 40 1000 0 3
show ip eigrp topology
```

```
R1#show ip eigrp topology
```

```
IP-EIGRP Topology Table for AS 20/ID(1.1.1.1)
```

```
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
r - Reply status
```

```
P 172.16.0.0/16, 1 successors, FD is 5120
via Summary (5120/0), Null0
P 172.16.10.0/24, 1 successors, FD is 5120
via Connected, GigabitEthernet0/0
P 209.165.100.0/24, 1 successors, FD is 2169856
via Summary (2169856/0), Null0
P 209.165.100.0/30, 1 successors, FD is 2169856
via Connected, Serial0/3/0
```

Router 2

Especificaciones

```
R2#show cdp neighbors
```

```
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID Local Intrfce Holdtime Capability Platform Port ID
R3 Ser 0/3/0 158 R C2900 Ser 0/3/1
R1 Ser 0/3/1 159 R C2900 Ser 0/3/0
```

```
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
Serial0/3/0 209.165.100.5 YES manual up up
Serial0/3/1 209.165.100.2 YES manual up up
Loopback0 200.200.200.1 YES manual up up
Vlan1 unassigned YES unset administratively down down
```

```
R2#show version
```

```
Cisco IOS Software, C2900 Software (C2900-UNIVERSALK9-M), Version 15.1(4)M4, RELEASE
SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2012 by Cisco Systems, Inc.
Compiled Thurs 5-Jan-12 15:41 by pt_team
```

```
ROM: System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
cisco2911 uptime is 3 minutes, 23 seconds
System returned to ROM by power-on
System image file is "flash0:c2900-universalk9-mz.SPA.151-1.M4.bin"
Last reload type: Normal Reload
```

```
...
```

```
R2#show startup-config
```

```
Using 1410 bytes
!
version 15.1
```

```
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
security passwords min-length 10
!
hostname R2
!
enable secret 5 $1$mERr$TfFTxE.mmb505BVC56ndL0
!
no ip cef
no ipv6 cef
!
username admin01 password 7 0820484300175546020A1F17
username adminSSH password 7 08204843001736243A1B0D1739
!
!
license udi pid CISC02911/K9 sn FTX15246785-
!
no ip domain-lookup
ip domain-name CCNA_CS3.com
!
!
spanning-tree mode pvst
!
interface Loopback0
ip address 200.200.200.1 255.255.255.0
!
interface GigabitEthernet0/0
no ip address
duplex auto
speed auto
shutdown
!
interface GigabitEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface GigabitEthernet0/2
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/3/0
description Link R2 --> R3
ip address 209.165.100.5 255.255.255.252
clock rate 2000000
!
interface Serial0/3/1
description Link R2 --> R1
ip address 209.165.100.2 255.255.255.252
clock rate 2000000
!
interface Vlan1
no ip address
shutdown
!
ip classless
!
ip flow-export version 9
!
banner motd ^C
```

```
*****
This is the R2 CLI
*****^C
!
line con 0
login local
!
line aux 0
!
line vty 0 4
login local
transport input ssh
line vty 5 15
login local
transport input ssh
!
!
!
end
```

show standby (No tiene ninguna configuración standby)

show standby brief (No tiene ninguna configuración standby)

Protocolo OSPF

R2#show ip route

```
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
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, E - EGP
i - IS-IS, 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
```

Gateway of last resort is not set

```
172.16.0.0/24 is subnetted, 1 subnets
0 IA 172.16.10.0/24 [110/1064] via 209.165.100.6, 00:04:26, Serial0/3/0
[110/1064] via 209.165.100.1, 00:04:26, Serial0/3/1
200.200.200.0/24 is variably subnetted, 2 subnets, 2 masks
C 200.200.200.0/24 is directly connected, Loopback0
L 200.200.200.1/32 is directly connected, Loopback0
209.165.100.0/24 is variably subnetted, 4 subnets, 2 masks
C 209.165.100.0/30 is directly connected, Serial0/3/1
L 209.165.100.2/32 is directly connected, Serial0/3/1
C 209.165.100.4/30 is directly connected, Serial0/3/0
L 209.165.100.5/32 is directly connected, Serial0/3/0
```

R2#show ip protocols

```
Routing Protocol is "ospf 10"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 2.2.2.2
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
200.200.200.0 0.0.0.255 area 0
209.165.100.0 0.0.0.3 area 0
209.165.100.4 0.0.0.3 area 0
Routing Information Sources:
Gateway Distance Last Update
1.1.1.1 110 00:05:00
2.2.2.2 110 00:04:59
```

3.3.3.3 110 00:04:59
Distance: (default is 110)

R2#show ip ospf

Routing Process "ospf 10" with ID 2.2.2.2
Supports only single TOS(TOS0) routes
Supports opaque LSA
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
Number of external LSA 0. Checksum Sum 0x000000
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
External flood list length 0
Area BACKBONE(0)
Number of interfaces in this area is 3
Area has message digest authentication
SPF algorithm executed 3 times
Area ranges are
Number of LSA 6. Checksum Sum 0x02e178
Number of opaque link LSA 0. Checksum Sum 0x000000
Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0

R2#show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
1.1.1.1	0	FULL/	- 00:00:18	209.165.100.1	Serial0/3/1
3.3.3.3	0	FULL/	- 00:00:17	209.165.100.6	Serial0/3/0

R2#show ip ospf database

OSPF Router with ID (2.2.2.2) (Process ID 10)
Router Link States (Area 0)
Link ID ADV Router Age Seq# Checksum Link count
1.1.1.1 1.1.1.1 379 0x80000003 0x009e5f 2
2.2.2.2 2.2.2.2 378 0x80000007 0x00031c 5
3.3.3.3 3.3.3.3 378 0x80000003 0x00a341 2
Summary Net Link States (Area 0)
Link ID ADV Router Age Seq# Checksum
172.16.10.0 3.3.3.3 379 0x80000001 0x006f31
172.16.10.0 1.1.1.1 377 0x80000001 0x00abfc

Summary ASB Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum
2.2.2.2	1.1.1.1	344	0x80000002	0x00818f

R2#show ip ospf interface s0/3/1

Serial0/3/1 is up, line protocol is up
Internet address is 209.165.100.2/30, Area 0
Process ID 10, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 64
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 5, Dead 20, Wait 20, Retransmit 5
Hello due in 00:00:01
Index 3/3, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1

```

Adjacent with neighbor 1.1.1.1
Suppress hello for 0 neighbor(s)
Message digest authentication enabled
Youngest key id is 1

```

```

R2#show ip ospf interface s0/3/0
Serial0/3/0 is up, line protocol is up
Internet address is 209.165.100.5/30, Area 0
Process ID 10, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 64
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 5, Dead 20, Wait 20, Retransmit 5
Hello due in 00:00:01
Index 2/2, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1 , Adjacent neighbor count is 1
Adjacent with neighbor 3.3.3.3
Suppress hello for 0 neighbor(s)
Message digest authentication enabled
Youngest key id is 1

```

```
show ip ospf interface brief (No suportado en Packet Tracer)
```

Protocolo EIGRP

```

R2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
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, E - EGP
i - IS-IS, 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

```

```
Gateway of last resort is not set
```

```

D 172.16.0.0/16 [90/2172416] via 209.165.100.1, 00:07:45, Serial0/3/1
200.200.200.0/24 is variably subnetted, 2 subnets, 2 masks
C 200.200.200.0/24 is directly connected, Loopback0
L 200.200.200.1/32 is directly connected, Loopback0
209.165.100.0/24 is variably subnetted, 4 subnets, 2 masks
C 209.165.100.0/30 is directly connected, Serial0/3/1
L 209.165.100.2/32 is directly connected, Serial0/3/1
C 209.165.100.4/30 is directly connected, Serial0/3/0
L 209.165.100.5/32 is directly connected, Serial0/3/0

```

```

R2#show ip protocols
Routing Protocol is "eigrp 20 "
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Default networks flagged in outgoing updates
Default networks accepted from incoming updates
Redistributing: eigrp 20
EIGRP-IPv4 Protocol for AS(20)
Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
NSF-aware route hold timer is 240
Router-ID: 2.2.2.2
Topology : 0 (base)
Active Timer: 3 min
Distance: internal 90 external 170

```


Maximum path: 4
 Maximum hopcount 100
 Maximum metric variance 1

Automatic Summarization: enabled
 Automatic address summarization:
 Maximum path: 4
 Routing for Networks:
 209.165.100.0/30
 Routing Information Sources:
 Gateway Distance Last Update
 209.165.100.1 90 8369
 Distance: internal 90 external 170

R2#show ip eigrp neighbors
 IP-EIGRP neighbors for process 20
 H Address Interface Hold Uptime SRTT RTO Q Seq
 (sec) (ms) Cnt Num
 0 209.165.100.1 Se0/3/1 13 00:17:46 40 1000 0 1

R2#show ip eigrp topology
 IP-EIGRP Topology Table for AS 20/ID(2.2.2.2)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
 r - Reply status

P 172.16.0.0/16, 1 successors, FD is 2172416
 via 209.165.100.1 (2172416/5120), Serial0/3/1
 P 209.165.100.0/30, 1 successors, FD is 2169856
 via Connected, Serial0/3/1

Router 3

Especificaciones

R3#show cdp neighbors
 Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
 S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
 Device ID Local Intrfce Holdtme Capability Platform Port ID
 SW2 Gig 0/0 143 S 2960 Fas 0/5
 R2 Ser 0/3/1 142 R C2900 Ser 0/3/0

R3#show cdp neighbors
 Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
 S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
 Device ID Local Intrfce Holdtme Capability Platform Port ID
 SW2 Gig 0/0 143 S 2960 Fas 0/5
 R2 Ser 0/3/1 142 R C2900 Ser 0/3/0

R3#show version
 Cisco IOS Software, C2900 Software (C2900-UNIVERSALK9-M), Version 15.1(4)M4, RELEASE
 SOFTWARE (fc2)
 Technical Support: <http://www.cisco.com/techsupport>
 Copyright (c) 1986-2012 by Cisco Systems, Inc.
 Compiled Thurs 5-Jan-12 15:41 by pt_team
 ...

R3#show startup-config
 Using 1364 bytes
 !
 version 15.1
 no service timestamps log datetime msec
 no service timestamps debug datetime msec
 service password-encryption

```

security passwords min-length 10
!
hostname R3
!
enable secret 5 $1$mERr$TfFTxE.mmb505BVC56ndL0
!
no ip cef
no ipv6 cef
!
username admin01 password 7 0820484300175546020A1F17
username adminSSH password 7 08204843001736243A1B0D1739
!
license udi pid CISC02911/K9 sn FTX1524FTY1-
!
ip domain-name CCNA_CS3.com
!
!
spanning-tree mode pvst
!
interface GigabitEthernet0/0
description LAN 3
ip address 172.16.10.3 255.255.255.0
duplex auto
speed auto
standby version 2
standby 2 ip 172.16.10.4
standby 2 priority 101
standby preempt
standby 1 ip 172.16.10.2
!
interface GigabitEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface GigabitEthernet0/2
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/3/0
no ip address
clock rate 2000000
shutdown
!
interface Serial0/3/1
description Link R3 --> R2
ip address 209.165.100.6 255.255.255.252
!
interface Vlan1
no ip address
shutdown
!
ip classless
!
ip flow-export version 9
!
banner motd ^C
*****
This is the R3 CLI.
*****^C
!

```

```

!
line con 0
login local
!
line aux 0
!
line vty 0 4
login local
line vty 5 15
login local
!
end

```

R3#show standby

```

GigabitEthernet0/0 - Group 2 (version 2)
State is Active
7 state changes, last state change 00:00:19
Virtual IP address is 172.16.10.4
Active virtual MAC address is 0000.0C9F.F002
Local virtual MAC address is 0000.0C9F.F002 (v2 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 0.447 secs
Preemption disabled
Active router is local
Standby router is 172.16.10.1
Priority 101 (configured 101)
Group name is hsrp-Gig0/0-2 (default)
GigabitEthernet0/0 - Group 1 (version 2)
State is Active
7 state changes, last state change 00:00:19
Virtual IP address is 172.16.10.2
Active virtual MAC address is 0000.0C9F.F001
Local virtual MAC address is 0000.0C9F.F001 (v2 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 0.634 secs
Preemption disabled
Active router is local
Standby router is 172.16.10.1
Priority 100 (default 100)
Group name is hsrp-Gig0/0-1 (default)

```

R3#show standby brief

```

P indicates configured to preempt.
|
Interface Grp Pri P State Active Standby Virtual IP
Gig0/0 2 101 Active local 172.16.10.1 172.16.10.4
Gig0/0 1 100 Active local 172.16.10.1 172.16.10.2

```

Protocolo OSPF

R3#show ip route

```

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
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, E - EGP
i - IS-IS, 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

```

Gateway of last resort is not set

```

172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 172.16.10.0/24 is directly connected, GigabitEthernet0/0
L 172.16.10.3/32 is directly connected, GigabitEthernet0/0
200.200.200.0/32 is subnetted, 1 subnets

```

```
O 200.200.200.1/32 [110/65] via 209.165.100.5, 00:11:08, Serial0/3/1
209.165.100.0/24 is variably subnetted, 3 subnets, 2 masks
O 209.165.100.0/30 [110/128] via 209.165.100.5, 00:11:08, Serial0/3/1
C 209.165.100.4/30 is directly connected, Serial0/3/1
L 209.165.100.6/32 is directly connected, Serial0/3/1
```

R3#show ip protocols

```
Routing Protocol is "ospf 10"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 3.3.3.3
Number of areas in this router is 2. 2 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
172.16.10.0 0.0.0.255 area 1
209.165.100.0 0.0.0.3 area 0
209.165.100.4 0.0.0.3 area 0
Routing Information Sources:
Gateway Distance Last Update
1.1.1.1 110 00:11:46
2.2.2.2 110 00:11:47
3.3.3.3 110 00:11:47
Distance: (default is 110)
```

R3#show ip ospf

```
Routing Process "ospf 10" with ID 3.3.3.3
Supports only single TOS(TOS0) routes
Supports opaque LSA
It is an area border router
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
Number of external LSA 0. Checksum Sum 0x000000
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 2. 2 normal 0 stub 0 nssa
External flood list length 0
Area 1
Number of interfaces in this area is 1
Area has no authentication
SPF algorithm executed 3 times
Area ranges are
Number of LSA 7. Checksum Sum 0x03b8e7
Number of opaque link LSA 0. Checksum Sum 0x000000
Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0
Area BACKBONE(0)
Number of interfaces in this area is 1
Area has message digest authentication
SPF algorithm executed 4 times
Area ranges are
Number of LSA 6. Checksum Sum 0x02e178
Number of opaque link LSA 0. Checksum Sum 0x000000
Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0
```

R3#show ip ospf neighbor

```
Neighbor ID Pri State Dead Time Address Interface
1.1.1.1 1 FULL/BDR 00:00:32 172.16.10.1 GigabitEthernet0/0
```

2.2.2.2 0 FULL/ - 00:00:18 209.165.100.5 Serial0/3/1

R3#show ip ospf neighbor

```
Neighbor ID Pri State Dead Time Address Interface
1.1.1.1 1 FULL/BDR 00:00:32 172.16.10.1 GigabitEthernet0/0
2.2.2.2 0 FULL/ - 00:00:18 209.165.100.5 Serial0/3/1
```

R3#show ip ospf database

```
OSPF Router with ID (3.3.3.3) (Process ID 10)
Router Link States (Area 0)
Link ID ADV Router Age Seq# Checksum Link count
3.3.3.3 3.3.3.3 802 0x80000003 0x00a341 2
2.2.2.2 2.2.2.2 802 0x80000007 0x00031c 5
1.1.1.1 1.1.1.1 801 0x80000003 0x009e5f 2
Summary Net Link States (Area 0)
Link ID ADV Router Age Seq# Checksum
172.16.10.0 3.3.3.3 803 0x80000001 0x006f31
172.16.10.0 1.1.1.1 801 0x80000001 0x00abfc
Summary ASB Link States (Area 0)
Link ID ADV Router Age Seq# Checksum
2.2.2.2 1.1.1.1 768 0x80000002 0x00818f
```

Router Link States (Area 1)

```
Link ID ADV Router Age Seq# Checksum Link count
3.3.3.3 3.3.3.3 768 0x80000003 0x0012a9 1
1.1.1.1 1.1.1.1 763 0x80000005 0x00f2af 2
```

Net Link States (Area 1)

```
Link ID ADV Router Age Seq# Checksum
172.16.10.3 3.3.3.3 768 0x80000001 0x00e079
```

Summary Net Link States (Area 1)

```
Link ID ADV Router Age Seq# Checksum
209.165.100.4 3.3.3.3 791 0x80000002 0x00b97b
200.200.200.1 3.3.3.3 791 0x80000003 0x007143
209.165.100.0 3.3.3.3 791 0x80000004 0x006096
```

Summary ASB Link States (Area 1)

```
Link ID ADV Router Age Seq# Checksum
2.2.2.2 3.3.3.3 791 0x80000001 0x0047c2
```

R3#show ip ospf interface s0/3/1

```
Serial0/3/1 is up, line protocol is up
Internet address is 209.165.100.6/30, Area 0
Process ID 10, Router ID 3.3.3.3, Network Type POINT-TO-POINT, Cost: 64
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 5, Dead 20, Wait 20, Retransmit 5
Hello due in 00:00:00
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 2.2.2.2
Suppress hello for 0 neighbor(s)
Message digest authentication enabled
Youngest key id is 1
```

R3#show ip ospf interface g0/0

```
GigabitEthernet0/0 is up, line protocol is up
Internet address is 172.16.10.3/24, Area 1
Process ID 10, Router ID 3.3.3.3, Network Type BROADCAST, Cost: 1000
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 3.3.3.3, Interface address 172.16.10.3
Backup Designated Router (ID) 1.1.1.1, Interface address 172.16.10.1
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:07
Index 2/2, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 1.1.1.1 (Backup Designated Router)
  Suppress hello for 0 neighbor(s)
```

show ip ospf interface brief (No suportado por Packet Tracer)

Protocolo EIGRP

R3#show ip route

```
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
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, E - EGP
i - IS-IS, 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
```

Gateway of last resort is not set

```
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 172.16.10.0/24 is directly connected, GigabitEthernet0/0
L 172.16.10.3/32 is directly connected, GigabitEthernet0/0
209.165.100.0/24 is variably subnetted, 3 subnets, 3 masks
D 209.165.100.0/24 [90/2172416] via 172.16.10.1, 00:21:48, GigabitEthernet0/0
C 209.165.100.4/30 is directly connected, Serial0/3/1
L 209.165.100.6/32 is directly connected, Serial0/3/1
```

R3#show ip protocols

```
Routing Protocol is "eigrp 20 "
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Default networks flagged in outgoing updates
Default networks accepted from incoming updates
Redistributing: eigrp 20
EIGRP-IPv4 Protocol for AS(20)
Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
NSF-aware route hold timer is 240
Router-ID: 172.16.10.3
Topology : 0 (base)
Active Timer: 3 min
Distance: internal 90 external 170
Maximum path: 4
Maximum hopcount 100
Maximum metric variance
Automatic Summarization: enabled
Automatic address summarization:
Maximum path: 4
Routing for Networks:
172.16.10.0/24
209.165.100.0/30
```

```

Routing Information Sources:
Gateway Distance Last Update
172.16.10.1 90 33055
Distance: internal 90 external 170

```

```

R3#show ip eigrp neighbors
IP-EIGRP neighbors for process 20
H Address Interface Hold Uptime SRTT RTO Q Seq
(sec) (ms) Cnt Num
0 172.16.10.1 Gig0/0 13 00:23:08 40 1000 0

```

```

R3#show ip eigrp topology
IP-EIGRP Topology Table for AS 20/ID(209.165.100.6)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
r - Reply status
P 172.16.10.0/24, 1 successors, FD is 5120
via Connected, GigabitEthernet0/0
P 209.165.100.0/24, 1 successors, FD is 2172416
via 172.16.10.1 (2172416/2169856), GigabitEthernet0/0

```

Configuraciones de Switch's

Switch 1

```

SW1#show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID Local Intrfce Holdtme Capability Platform Port ID
R1 Fas 0/5 154 R C2900 Gig 0/0
SW3 Por 1 148 S 2960 Fas 0/4
SW3 Por 1 148 S 2960 Por 1
SW3 Por 1 148 S 2960 Fas 0/3
SW2 Por 3 148 S 2960 Fas 0/1
SW2 Por 3 148 S 2960 Fas 0/2
SW2 Por 3 148 S 2960 Por 3

```

```

SW1#show ip interface brief
Interface IP-Address OK? Method Status Protocol
Port-channel1 unassigned YES manual up up
Port-channel3 unassigned YES manual up up
FastEthernet0/1 unassigned YES manual up up
FastEthernet0/2 unassigned YES manual up up
FastEthernet0/3 unassigned YES manual up up
FastEthernet0/4 unassigned YES manual up up
FastEthernet0/5 unassigned YES manual up up
...
FastEthernet0/11 unassigned YES manual up up
Vlan99 172.16.99.11 YES manual up up

```

```

SW1#show interfaces trunk
Port Mode Encapsulation Status Native vlan
Po1 on 802.1q trunking 99
Po3 on 802.1q trunking 99

```

```

Port Vlans allowed on trunk
Po1 10,99
Po3 10,99

```

```

Port Vlans allowed and active in management domain
Po1 10,99
Po3 10,99

```

```

Port Vlans in spanning tree forwarding state and not pruned

```

Po1 10,99

Po3 10,99

SW1#show interface vlan 99

```
Vlan99 is up, line protocol is up
Hardware is CPU Interface, address is 0090.2b4c.6b01 (bia 0090.2b4c.6b01)
Internet address is 172.16.99.11/24
MTU 1500 bytes, BW 100000 Kbit, DLY 1000000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
ARP type: ARPA, ARP Timeout 04:00:00
Last input 21:40:21, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
1682 packets input, 530955 bytes, 0 no buffer
Received 0 broadcasts (0 IP multicast)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
563859 packets output, 0 bytes, 0 underruns
0 output errors, 23 interface resets
0 output buffer failures, 0 output buffers swapped out
```

SW1#show vlan

VLAN Name Status Ports

```
-----
1 default active Fa0/17, Fa0/18, Fa0/19, Fa0/20
Fa0/21, Fa0/22, Fa0/23, Fa0/24
Gig0/1, Gig0/2
10 Sales active Fa0/5, Fa0/6, Fa0/7, Fa0/8
Fa0/9, Fa0/10, Fa0/11, Fa0/12
Fa0/13, Fa0/14, Fa0/15, Fa0/16
99 Management active
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active
```

VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2

```
-----
1 enet 100001 1500 - - - - 0 0
10 enet 100010 1500 - - - - 0 0
99 enet 100099 1500 - - - - 0 0
1002 fddi 101002 1500 - - - - 0 0
1003 tr 101003 1500 - - - - 0 0
1004 fdnet 101004 1500 - - - ieee - 0 0
1005 trnet 101005 1500 - - - ibm - 0 0
```

VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2

Remote SPAN VLANs

Primary Secondary Type Ports

SW1#show spanning-tree

VLAN0010


```
Spanning tree enabled protocol ieee
Root ID Priority 24586
Address 0001.43CA.9115
Cost 9
Port 28(Port-channel3)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Bridge ID Priority 28682 (priority 28672 sys-id-ext 10)
Address 0090.2B4C.6B72
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20
```

```
Interface Role Sts Cost Prio.Nbr Type
-----
```

```
Fa0/5 Desg FWD 19 128.5 P2p
Fa0/11 Desg FWD 19 128.11 P2p
Po1 Desg FWD 9 128.27 Shr
Po3 Root FWD 9 128.28 Shr
```

```
VLAN0099
Spanning tree enabled protocol ieee
Root ID Priority 24675
Address 0090.2B4C.6B72
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Bridge ID Priority 24675 (priority 24576 sys-id-ext 99)
Address 0090.2B4C.6B72
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20
```

```
Interface Role Sts Cost Prio.Nbr Type
-----
```

```
Po1 Desg FWD 9 128.27 Shr
Po3 Desg FWD 9 128.28 Shr
```

```
show port-security (No configurado)
show port-security interface <secured port> (No configurado)
```

Switch 2

```
SW2#show cdp neighbors
```

```
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID Local Intrfce Holdtme Capability Platform Port ID
SW3 Por 2 142 S 2960 Fas 0/1
SW3 Por 2 142 S 2960 Por 2
R3 Fas 0/5 151 R C2900 Gig 0/0
SW1 Por 3 142 S 2960 Fas 0/2
SW1 Por 3 142 S 2960 Fas 0/1
SW1 Por 3 142 S 2960 Por 3
SW3 Por 2 142 S 2960 Fas 0/2
```

```
SW2#show ip interface brief
```

```
Interface IP-Address OK? Method Status Protocol
Port-channel1 unassigned YES manual down down
Port-channel2 unassigned YES manual up up
Port-channel3 unassigned YES manual up up
FastEthernet0/1 unassigned YES manual up up
FastEthernet0/2 unassigned YES manual up up
FastEthernet0/3 unassigned YES manual up up
FastEthernet0/4 unassigned YES manual up up
FastEthernet0/5 unassigned YES manual up up
```

```
...
FastEthernet0/11 unassigned YES manual up up
Vlan99 172.16.99.12 YES manual up up
```

SW2#show interfaces trunk

```
Port Mode Encapsulation Status Native vlan
Po2 on 802.1q trunking 99
Po3 on 802.1q trunking 99
```

Port Vlans allowed on trunk

```
Po2 10,99
Po3 10,99
```

Port Vlans allowed and active in management domain

```
Po2 10,99
Po3 10,99
```

Port Vlans in spanning tree forwarding state and not pruned

```
Po2 10,99
Po3 10,99
```

SW2#show interfaces vlan 99

```
Vlan99 is up, line protocol is up
Hardware is CPU Interface, address is 0001.43ca.9101 (bia 0001.43ca.9101)
Internet address is 172.16.99.12/24
MTU 1500 bytes, BW 100000 Kbit, DLY 1000000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
ARP type: ARPA, ARP Timeout 04:00:00
Last input 21:40:21, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
1682 packets input, 530955 bytes, 0 no buffer
Received 0 broadcasts (0 IP multicast)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
563859 packets output, 0 bytes, 0 underruns
0 output errors, 23 interface resets
0 output buffer failures, 0 output buffers swapped out
```

SW2#show vlan

```
VLAN Name Status Ports
-----
1 default active Po1, Fa0/17, Fa0/18, Fa0/19
Fa0/20, Fa0/21, Fa0/22, Fa0/23
Fa0/24, Gig0/1, Gig0/2
10 Sales active Fa0/5, Fa0/6, Fa0/7, Fa0/8
Fa0/9, Fa0/10, Fa0/11, Fa0/12
Fa0/13, Fa0/14, Fa0/15, Fa0/16
99 Management active
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active
```

```
VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2
```

```
-----
1 enet 100001 1500 - - - - 0 0
10 enet 100010 1500 - - - - 0 0
99 enet 100099 1500 - - - - 0 0
```

```

1002 fddi 101002 1500 - - - - 0 0
1003 tr 101003 1500 - - - - 0 0
1004 fdnet 101004 1500 - - - ieee - 0 0
1005 trnet 101005 1500 - - - ibm - 0 0

```

```

VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2
-----

```

```

Remote SPAN VLANs
-----

```

```

Primary Secondary Type Ports
-----

```

SW2#show spanning-tree

```

VLAN0010
Spanning tree enabled protocol ieee
Root ID Priority 24586
Address 0001.43CA.9115
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

```

```

Bridge ID Priority 24586 (priority 24576 sys-id-ext 10)
Address 0001.43CA.9115
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

```

```

Interface Role Sts Cost Prio.Nbr Type
-----

```

```

Fa0/11 Desg FWD 19 128.11 P2p
Fa0/5 Desg FWD 19 128.5 P2p
Po2 Desg FWD 9 128.28 Shr
Po3 Desg FWD 9 128.29 Shr

```

```

VLAN0099

```

```

Spanning tree enabled protocol ieee
Root ID Priority 24675
Address 0090.2B4C.6B72
Cost 9
Port 29(Port-channel3)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

```

```

Bridge ID Priority 28771 (priority 28672 sys-id-ext 99)
Address 0001.43CA.9115
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

```

```

Interface Role Sts Cost Prio.Nbr Type
-----

```

```

Po2 Desg FWD 9 128.28 Shr
Po3 Root FWD 9 128.29 Shr

```

```

show port-security (No configurado)

```

```

show port-security interface <secured port> (No configurado)

```

Switch 3

SW3#show cdp neighbors

```

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID Local Intrfce Holdtme Capability Platform Port ID
SW1 Por 1 134 S 2960 Fas 0/4
SW1 Por 1 134 S 2960 Fas 0/3
SW1 Por 1 134 S 2960 Por 1
SW2 Por 2 134 S 2960 Fas 0/4

```

```
SW2 Por 2 134 S 2960 Fas 0/3
```

```
SW2 Por 2 134 S 2960 Por 2
```

SW3#show ip interface brief

```
Interface IP-Address OK? Method Status Protocol
Port-channel1 unassigned YES manual up up
Port-channel2 unassigned YES manual up up
FastEthernet0/1 unassigned YES manual up up
FastEthernet0/2 unassigned YES manual up up
FastEthernet0/3 unassigned YES manual up up
FastEthernet0/4 unassigned YES manual up up
FastEthernet0/5 unassigned YES manual down down
FastEthernet0/6 unassigned YES manual up up
...
Vlan99 172.16.99.13 YES manual up up
```

SW3#show interfaces trunk

```
Port Mode Encapsulation Status Native vlan
Po1 on 802.1q trunking 99
Po2 on 802.1q trunking 99
```

Port Vlans allowed on trunk

```
Po1 10,99
Po2 10,99
```

Port Vlans allowed and active in management domain

```
Po1 10,99
Po2 10,99
```

Port Vlans in spanning tree forwarding state and not pruned

```
Po1 99
Po2 10
```

SW3#show interfaces vlan 99

```
Vlan99 is up, line protocol is up
Hardware is CPU Interface, address is 00e0.8f48.4301 (bia 00e0.8f48.4301)
Internet address is 172.16.99.13/24
MTU 1500 bytes, BW 100000 Kbit, DLY 1000000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
ARP type: ARPA, ARP Timeout 04:00:00
Last input 21:40:21, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
1682 packets input, 530955 bytes, 0 no buffer
Received 0 broadcasts (0 IP multicast)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
563859 packets output, 0 bytes, 0 underruns
0 output errors, 23 interface resets
0 output buffer failures, 0 output buffers swapped out
```

SW3#show vlan

```
VLAN Name Status Ports
-----
1 default active Fa0/17, Fa0/18, Fa0/19, Fa0/20
Fa0/21, Fa0/22, Fa0/23, Fa0/24
Gig0/1, Gig0/2
```

```

10 Sales active Fa0/5, Fa0/6, Fa0/7, Fa0/8
Fa0/9, Fa0/10, Fa0/11, Fa0/12
Fa0/13, Fa0/14, Fa0/15, Fa0/16
99 Management active
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active

```

```

VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2
-----
1 enet 100001 1500 - - - - 0 0
10 enet 100010 1500 - - - - 0 0
99 enet 100099 1500 - - - - 0 0
1002 fddi 101002 1500 - - - - 0 0
1003 tr 101003 1500 - - - - 0 0
1004 fdnet 101004 1500 - - - ieee - 0 0
1005 trnet 101005 1500 - - - ibm - 0 0

```

```

VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2
-----

```

```

Remote SPAN VLANs
-----

```

```

Primary Secondary Type Ports
-----

```

SW3#show spanning-tree

```

VLAN0010
Spanning tree enabled protocol ieee
Root ID Priority 24586
Address 0001.43CA.9115
Cost 9
Port 28(Port-channel2)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

```

```

Bridge ID Priority 32778 (priority 32768 sys-id-ext 10)
Address 00E0.8F48.4369
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

```

```

Interface Role Sts Cost Prio.Nbr Type
-----

```

```

Fa0/6 Desg FWD 19 128.6 P2p
Po1 Altn BLK 9 128.27 Shr
Po2 Root FWD 9 128.28 Shr

```

```

VLAN0099
Spanning tree enabled protocol ieee
Root ID Priority 24675
Address 0090.2B4C.6B72
Cost 9
Port 27(Port-channel1)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

```

```

Bridge ID Priority 32867 (priority 32768 sys-id-ext 99)
Address 00E0.8F48.4369
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

```

```

Interface Role Sts Cost Prio.Nbr Type
-----

```

```

Po1 Root FWD 9 128.27 Shr

```

Po2 Altn BLK 9 128.28 Shr

show port-security (No configurado)

show port-security interface <secured port> (No configurado)

Conectividad

Verificación de conectividad en la red

Antes de configurar los protocolos de direccionamiento, el HSRP está configurado y el router enruta únicamente entre las redes que conoce.

PDU List Window										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	R1	R2	ICMP		0.000	N	0	(edit)	
	Successful	R2	R3	ICMP		0.000	N	1	(edit)	
	Successful	SW1	SW2	ICMP		0.000	N	2	(edit)	
	Successful	PC1	PC2	ICMP		0.000	N	3	(edit)	
	Successful	PC1	PC3	ICMP		0.000	N	4	(edit)	
	Successful	PC2	R1	ICMP		0.000	N	5	(edit)	
	Successful	PC2	R3	ICMP		0.000	N	6	(edit)	
	Failed	PC1	R2	ICMP		0.000	N	7	(edit)	
	Failed	SW3	R2	ICMP		0.000	N	8	(edit)	
	Failed	SW2	R2	ICMP		0.000	N	9	(edit)	

Después de implementar protocolos EIGRP o OSPF:

PDU List Window										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC1	R2	ICMP		0.000	N	0	(edit)	
	Successful	PC1	R3	ICMP		0.000	N	1	(edit)	
	Successful	PC1	R1	ICMP		0.000	N	2	(edit)	
	Successful	PC2	R2	ICMP		0.000	N	3	(edit)	
	Successful	PC3	R2	ICMP		0.000	N	4	(edit)	
	Successful	R2	PC2	ICMP		0.000	N	5	(edit)	