laSalle
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CCNA 4: CONNECTING NETWORKS

CASE STUD

Introducción

Resumen

Se nos presenta una solicitud de gestionar la instalación de una infraestructura a una entidad, a continuación, se presentan los planos facilitados a los administradores para llevar a cabo todos los requisitos demandados.

Requisitos

Los arquitectos de red nos indican que tenemos que implementar y seguir un procedimiento:

1) implementar el diseño físico de la red utilizando el diagrama facilitado.

2) Configure correctamente los enrutadores con una configuración básica del enrutador, todas las credenciales se han asignado acorde con el equipo de seguridad de la empresa.

3) Para acabar de ver completamente el funcionamiento de la infraestructura hemos de configure correctamente las funciones de enrutamiento que describen los requisitos de diseño, incluidos los protocolos de enrutamiento IGP y EGP.

4) Configure correctamente los interruptores con una configuración de interruptor básica.

5) Configure correctamente las funciones de conmutación que describen los requisitos de diseño, incluidas las características de seguridad y las características de redundancia, todos los protocolos que se han de utilizar se indican en el plano facilitado por los arquitectos.

6) Configurar correctamente PPP como protocolo de encapsulación de la capa de enlace de datos, la empresa quiere asegurar el tráfico que circula entre sus entidades.

7) Configure correctamente los protocolos de redundancia como HSRP, dada la carga que tienen los dispositivos enrutadores y la cantidad de los empleados, la empresa quiere una mayor disponibilidad de los equipos de red, nos piden que haya dos enrutadores que forman un standbay entre los dos para una mayor redundancia.

8) Para ver la comunicación entre el exterior en red, se configura la traducción de direcciones de red (NAT) para proporcionar comunicaciones entre redes internas y externas.

9) Para facilitar una comunicación segura entre entidades remotas de la entidad se procede a implementar el túnel GRE.

10) La entidad cuanta con muchos empleados y necesitan una facilitación de ip dinámicamente, se procede a configurar las funciones DHCP para proporcionar direccionamiento, además de reservar las ip correspondientes a los servidores internos.

11) La entidad esta dividida en varios departamentos y como trabajan con muchos datos confidenciales, aparte de contar con vlan’s y permisos de acceso, desde seguridad nos piden implementar algunos controles de acceso, sobre todo para partes de administraciones de IT, configuramos correctamente las listas de control de acceso (ACL) para filtrar parte del tráfico.

12) Configurar correctamente las herramientas de monitorización para facilitar la administración al equipo de IT, la mayor parte de trafico y datos, logs, se gestionarán por herramientas de análisis automatizadas.

13) Por último, al acabar la instalación, se nos solicita verificar la conectividad como es debido para que la entidad comience a usar la infraestructura implementada, procedemos a solucionar problemas y probar la conectividad entre todos los dispositivos.

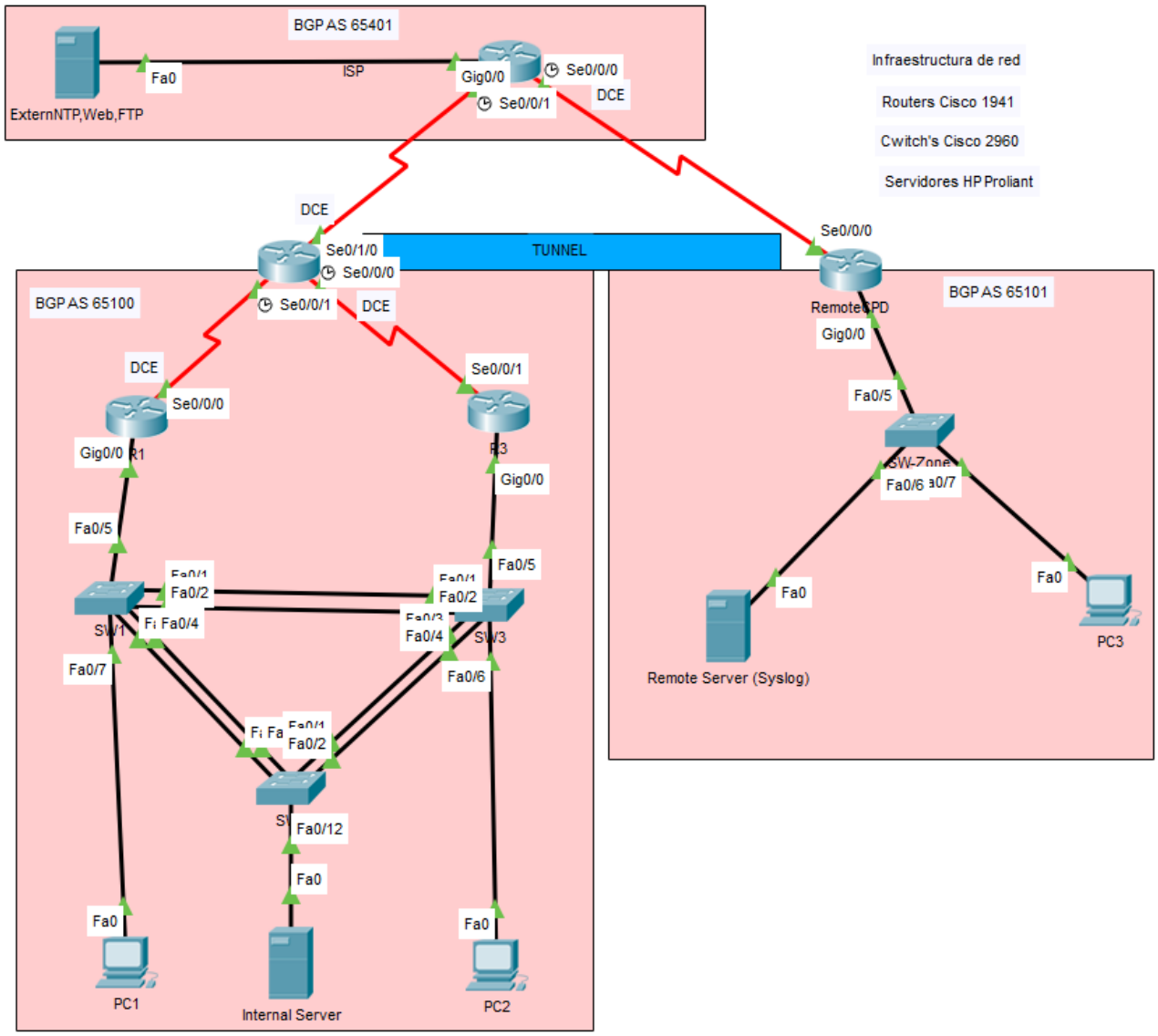
14) Proporcionar documentación detallada en un formulario prescrito, un equipo de administradores se encarga de realizar una pequeña memoria donde recoge los aspectos más importantes, para facilitar su mantenimiento en caso de incidencias.

Planificación

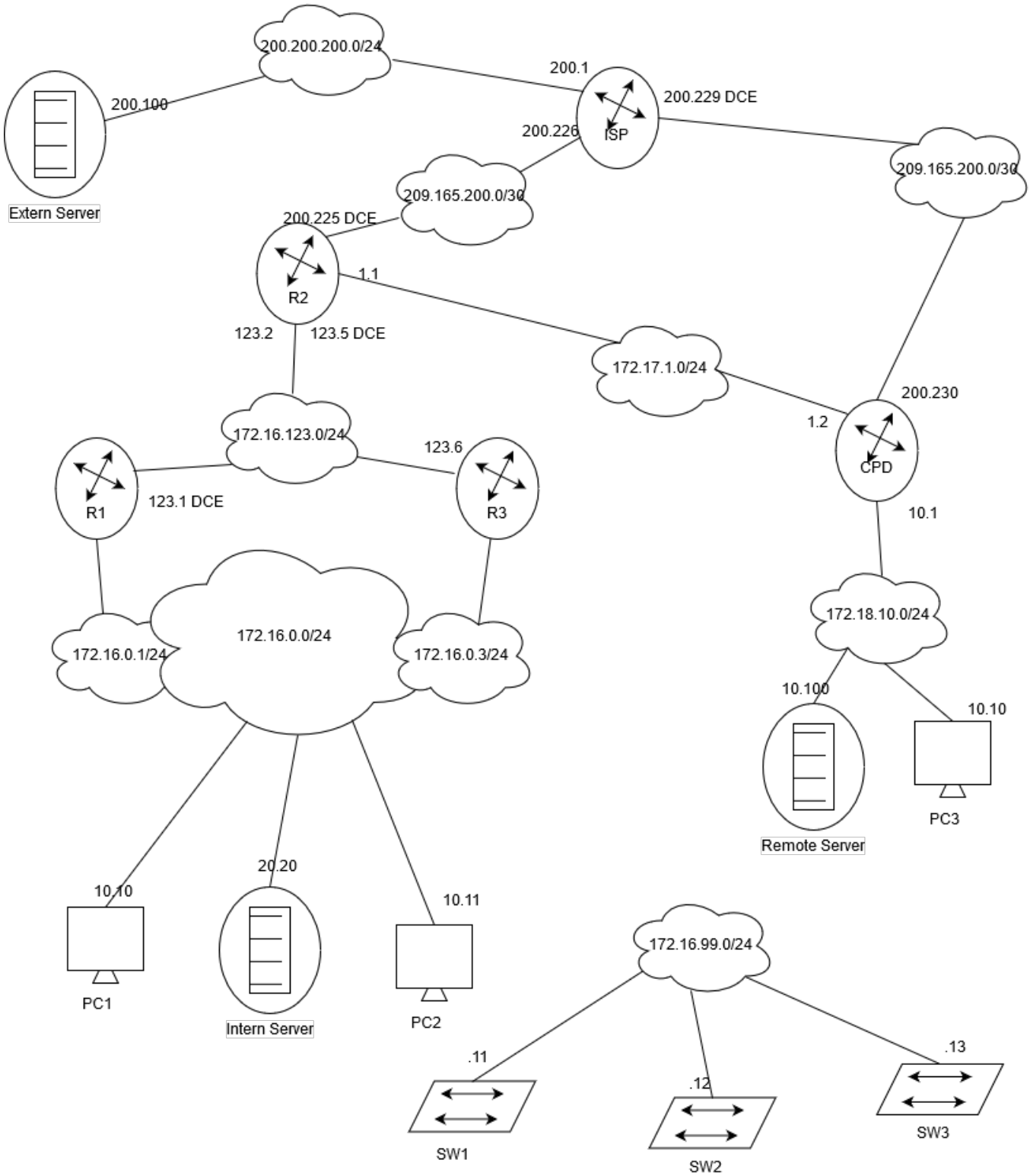
Planos de la infraestructura

A continuación, se presentan los planos que nos han presentado los arquitectos de la red.

Físico



Lógico


200.200.200.0/24
200.1
200.100
200.229 DCE
200.226
ISP
209.165.200.0/30
209.165.200.0/30
Extern Server
200.225 DCE
R2
1.1
123.2
123.5 DCE
172.17.1.0/24
200.230
1.2
CPD
172.16.123.0/24
123.6
R1
123.1 DCE
R3
10.1
172.18.10.0/24
172.16.0.0/24
172.16.0.1/24
172.16.0.3/24
10.100
10.10
Remote Server
PC3
20.20
10.10
10.11
PC1
Intern Server
PC2
172.16.99.0/24
.11
.12
.13
SW1
SW2
SW3

Identificación de los dispositivos

Física

Se procede a realizar etiquetas con una demo con un número interno que identifica los dispositivos de la red corporativa.

Lógica

Se ha acordado crear subredes para asignar direcciones ip a los dispositivos, se implementa dhcp para los equipos de trabajo, los servidores tendrán una ip fija reservada.

Direccionamiento ip

A continuación, observamos las ip asignadas a los dispositivos:

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	N/A	N/A	N/A
	G0/0.10	172.16.10.1	255.255.255.0	N/A
	G0/0.20	172.16.20.1	255.255.255.0	N/A
	G0/0.99	172.16.99.1	255.255.255.0	N/A
	Lo0	172.16.1.1	255.255.255.0	N/A
	Lo1	172.16.2.1	255.255.255.0	N/A
	Lo2	172.16.3.1	255.255.255.0	N/A
	S0/0/0	172.16.123.1	255.255.255.252	N/A
R2	S0/0/0	172.16.123.5	255.255.255.252	N/A
	S0/0/1	172.16.123.2	255.255.255.252	N/A
	S0/1/0	209.165.200.225	255.255.255.252	N/A
	Tunnel0	172.17.1.1	255.255.255.252	N/A
R3	G0/0	N/A	N/A	N/A
	G0/0.10	172.16.10.3	255.255.255.0	N/A
	G0/0.20	172.16.20.3	255.255.255.0	N/A
	G0/0.99	172.16.99.3	255.255.255.0	N/A
	Lo4	172.16.4.1	255.255.255.0	N/A
	Lo5	172.16.5.1	255.255.255.0	N/A
	Lo6	172.16.6.1	255.255.255.0	N/A
	S0/0/1	172.16.123.6	255.255.255.252	N/A
SW1	VLAN 99	172.16.99.11	255.255.255.0	172.16.99.2
SW2	VLAN 99	172.16.99.12	255.255.255.0	172.16.99.2
SW3	VLAN 99	172.16.99.13	255.255.255.0	172.16.99.2
ISP	G0/0	200.200.200.1	255.255.255.0	N/A
	S0/0/0	209.165.200.229	255.255.255.252	N/A
	S0/0/1	209.165.200.226	255.255.255.252	N/A
RemoteCPD	G0/0	172.18.10.1	255.255.255.0	N/A
	S0/0/0	209.165.200.230	255.255.255.252	N/A
	Tunnel0	172.17.1.2	255.255.255.252	N/A
PC1	NIC	172.16.10.10 or DHCP	255.255.255.0	172.16.10.2
PC2	NIC	172.16.10.11 or DHCP	255.255.255.0	172.16.10.2

PC3	NIC	172.18.10.10 or DHCP	255.255.255.0	172.18.10.1
Internal Server	NIC	172.16.20.20	255.255.255.0	172.16.20.2
Remote Server	NIC	172.18.10.100	255.255.255.0	172.18.10.1
External Server	NIC	200.200.200.100	255.255.255.0	200.200.200.1

Asignación de puertos a Switch's

Switch	Ports	Assignment	Network
SW1	F0/1 - F0/5	802.1q Trunks (Native VLAN 99)	172.16.99.0/24
	F0/6 - F0/11	VLAN 10 – Sales	172.16.10.0/24
	F0/12 - F0/17	VLAN 20 – Servers	172.16.20.0/24
SW2	F0/1 - F0/4	802.1q Trunks (Native VLAN 99)	172.16.99.0/24
	F0/6 - F0/11	VLAN 10 – Sales	172.16.10.0/24
	F0/12 - F0/17	VLAN 20 – Servers	172.16.20.0/24
SW3	F0/1- F0/5	802.1q Trunks (Native VLAN 99)	172.16.99.0/24
	F0/6 - F0/11	VLAN 10 – Sales	172.16.10.0/24
	F0/12 - F0/17	VLAN 20 – Servers	172.16.20.0/24

Información de vlan's

VLAN	VLAN Name
VLAN 99 (Native)	Management
VLAN 10	Sales
VLAN 20	Servers

Configuraciones de dispositivos

Control de acceso a 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	**-**	**ciscoconpa55**
Routers	Acceso remoto vía ssh	**adminSSH**	**adminSSHpass**
Switch's	Acceso remoto vía telnet	**remote**	**ciscovtypa55**
ISP	Console	**--**	**ciscoconpa55**
ISP	Privilegiado	**--**	**ciscoenpa55**

Dispositivos finales

Equipos de trabajo

Se les asigna la ip correspondiente según la tabla de direccionamiento mencionada anteriormente, o una configuración que les será facilitada por el servidor DHCP.

Servidores

Se les asigna una ip estática según la tabla mencionada anteriormente, a demás el servidor dhcp tiene reservado esas ip que corresponden a los servidores.
Información técnica.

Routers

Se procede a realizar las configuraciones necesarias en los enrutadores, según las necesidades acordadas, se habilitan controles de acceso a todos los dispositivos, a continuación se detallan los resultados de cada apartado:

Router 1

- show cdp neighbors

```
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 0/0.99 160 S 2960 Fas 0/5
R2 Ser 0/0/0 160 R C1900 Ser 0/0/1
```

- show ip interface brief

```
R1#  show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  up                    up
GigabitEthernet0/0.10  172.16.10.1     YES manual up                    up
GigabitEthernet0/0.20  172.16.20.1     YES manual up                    up
GigabitEthernet0/0.99  172.16.99.1     YES manual up                    up
GigabitEthernet0/1     unassigned      YES unset  administratively down down
Serial0/0/0            172.16.123.1    YES manual up                    up
Serial0/0/1            unassigned      YES unset  administratively down down
Serial0/1/0            unassigned      YES unset  administratively down down
Serial0/1/1            unassigned      YES unset  administratively down down
Loopback0              172.16.1.1      YES manual up                    up
Loopback1              172.16.2.1      YES manual up                    up
Loopback2              172.16.3.1      YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
```

- show interface <type_slot_port>

```
R1#show interfaces serial 0/0/0
Serial0/0/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Description: Link R1 ---------> R2
  Internet address is 172.16.123.1/30
  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 108 bits/sec, 0 packets/sec
5 minute output rate 108 bits/sec, 0 packets/sec
2304 packets input, 212529 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
2570 packets output, 258295 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
0 output buffer failures, 0 output buffers swapped out
0 carrier transitions
DCD=up DSR=up DTR=up RTS=up CTS=up

- show versión

R1#show version
Cisco IOS Software, C1900 Software (C1900-UNIVERSALK9-M), Version 15.1(4)M4, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 23-Feb-11 14:19 by pt_team

ROM: System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
cisco1941 uptime is 2 hours, 15 minutes, 51 seconds
System returned to ROM by power-on
System image file is "flash0:c1900-universalk9-mz.SPA.151-1.M4.bin"
Last reload type: Normal Reload

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to export@cisco.com.
Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
4 Low-speed serial(sync/async) network interface(s)

DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

License Info:

License UDI:

```
-------------------------------------------------
Device#   PID               SN
-------------------------------------------------
*0       CISCO1941/K9        FTX1524MXS3-


Technology Package License Information for Module:'c1900'

-----------------------------------------------------------------
Technology    Technology-package        Technology-package
           Current       Type         Next reboot
-----------------------------------------------------------------
ipbase       ipbasek9     Permanent    ipbasek9
security     disable      None         None
data         disable      None         None

Configuration register is 0x2102
```

- show startup-config

```
R1#show startup-config
Using 3199 bytes
!
version 15.1
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.mmb5O5BVC56ndL0
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
!
username admin01 password 7 0820484300175546020A1F17
username adminSSH password 7 0820484300173624 3A1B0D1739
!
```

```
!
license udi pid CISCO1941/K9 sn FTX1524MXS3-
no ip domain-lookup
ip domain-name CCNA_CS4.com
!
!
spanning-tree mode pvst
interface Loopback0
 ip address 172.16.1.1 255.255.255.0
!
interface Loopback1
 ip address 172.16.2.1 255.255.255.0
!
interface Loopback2
 ip address 172.16.3.1 255.255.255.0
!
interface GigabitEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/0.10
 description Lan 10
 encapsulation dot1Q 10
 ip address 172.16.10.1 255.255.255.0
 ip access-group 101 in
 standby 1 ip 172.16.10.2
!
interface GigabitEthernet0/0.20
 description Lan 20
 encapsulation dot1Q 20
 ip address 172.16.20.1 255.255.255.0
 ip access-group 101 in
 standby 2 ip 172.16.20.2
 standby 2 priority 101
 standby 2 preempt
!
interface GigabitEthernet0/0.99
 description Lan 99
 encapsulation dot1Q 99 native
 ip address 172.16.99.1 255.255.255.0
 ip access-group 101 in
 standby 3 ip 172.16.99.2
 standby 3 priority 101
 standby 3 preempt
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 description Link R1 ---------> R2
```

```
 ip address 172.16.123.1 255.255.255.252
 ip ospf message-digest-key 1 md5 routingOSPF
 ip ospf hello-interval 5
 ip ospf dead-interval 20
!
interface Serial0/0/1
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial0/1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial0/1/1
 no ip address
 clock rate 2000000
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
router ospf 10
 router-id 1.1.1.1
 log-adjacency-changes
 area 1 range 172.16.0.0 255.255.255.0
 area 0 authentication message-digest
 redistribute connected
 passive-interface GigabitEthernet0/0
 passive-interface GigabitEthernet0/0.10
 passive-interface GigabitEthernet0/0.20
 passive-interface GigabitEthernet0/0.99
 network 172.16.1.0 0.0.0.255 area 1
 network 172.16.2.0 0.0.0.255 area 1
 network 172.16.3.0 0.0.0.255 area 1
 network 172.16.10.0 0.0.0.255 area 0
 network 172.16.20.0 0.0.0.255 area 0
 network 172.16.99.0 0.0.0.255 area 0
 network 172.16.123.0 0.0.0.3 area 0
 default-information originate
!
ip classless
!
ip flow-export version 9
!
!
access-list 101 deny tcp 172.16.20.0 0.0.0.255 host 172.16.10.1 eq 22
access-list 101 deny tcp 172.16.99.0 0.0.0.255 host 172.16.10.1 eq 22
access-list 101 permit ip any any
access-list 101 deny tcp 172.16.20.0 0.0.0.255 host 172.16.10.1 eq telnet
access-list 101 deny tcp 172.16.99.0 0.0.0.255 host 172.16.10.1 eq telnet
!
```

```
banner motd ^Chis is R1 CLI.

^C
!
!
!
!
!
logging 172.18.10.100
line con 0
 password 7 0822455D0A1606181C1B0D517F
!
line aux 0
!
line vty 0 4
 login local
 transport input ssh
 transport output ssh
line vty 5 15
 login local
 transport input ssh
 transport output ssh
!
!
ntp server 200.200.200.100
ntp update-calendar
!
end
```

- show standby

```
R1#show standby
GigabitEthernet0/0.10 - Group 1
  State is Standby
    7 state changes, last state change 00:00:38
  Virtual IP address is 172.16.10.2
  Active virtual MAC address is 0000.0C07.AC01
    Local virtual MAC address is 0000.0C07.AC01 (v1 default)
  Hello time 3 sec, hold time 10 sec
    Next hello sent in 2.119 secs
  Preemption disabled
  Active router is 172.16.10.3
  Standby router is local
  Priority 100 (default 100)
  Group name is hsrp-Gig-1 (default)
GigabitEthernet0/0.20 - Group 2
  State is Active
    5 state changes, last state change 00:00:19
  Virtual IP address is 172.16.20.2
  Active virtual MAC address is 0000.0C07.AC02
    Local virtual MAC address is 0000.0C07.AC02 (v1 default)
  Hello time 3 sec, hold time 10 sec
    Next hello sent in 0.996 secs
  Preemption enabled
  Active router is local
  Standby router is 172.16.20.3
```

```
  Priority 101 (configured 101)
  Group name is hsrp-Gig-2 (default)
GigabitEthernet0/0.99 - Group 3
  State is Active
    5 state changes, last state change 00:00:22
  Virtual IP address is 172.16.99.2
  Active virtual MAC address is 0000.0C07.AC03
    Local virtual MAC address is 0000.0C07.AC03 (v1 default)
  Hello time 3 sec, hold time 10 sec
    Next hello sent in 2.196 secs
  Preemption enabled
  Active router is local
  Standby router is 172.16.99.3, priority 100 (expires in 7 sec)
  Priority 101 (configured 101)
  Group name is hsrp-Gig-3 (default)
```

- show standby brief

```
R1#  show standby brief
                P indicates configured to preempt.
                |
Interface   Grp  Pri P State    Active          Standby         Virtual IP
Gig         1    100   Standby  172.16.10.3     local           172.16.10.2
Gig         2    101 P Active   local           172.16.20.3     172.16.20.2
Gig         3    101 P Active   local           172.16.99.3     172.16.99.2
```

- show ip route

```
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, 16 subnets, 4 masks
C       172.16.1.0/24 is directly connected, Loopback0
L       172.16.1.1/32 is directly connected, Loopback0
C       172.16.2.0/24 is directly connected, Loopback1
L       172.16.2.1/32 is directly connected, Loopback1
C       172.16.3.0/24 is directly connected, Loopback2
L       172.16.3.1/32 is directly connected, Loopback2
O IA    172.16.4.0/22 [110/129] via 172.16.123.2, 00:23:17, Serial0/0/0
C       172.16.10.0/24 is directly connected, GigabitEthernet0/0.10
L       172.16.10.1/32 is directly connected, GigabitEthernet0/0.10
C       172.16.20.0/24 is directly connected, GigabitEthernet0/0.20
L       172.16.20.1/32 is directly connected, GigabitEthernet0/0.20
C       172.16.99.0/24 is directly connected, GigabitEthernet0/0.99
L       172.16.99.1/32 is directly connected, GigabitEthernet0/0.99
C       172.16.123.0/30 is directly connected, Serial0/0/0
L       172.16.123.1/32 is directly connected, Serial0/0/0
O       172.16.123.4/30 [110/128] via 172.16.123.2, 00:23:17, Serial0/0/0
```

- show ip protocols

```
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
  It is an autonomous system boundary router
  Redistributing External Routes from,
    connected
  Number of areas in this router is 2. 2 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.16.1.0 0.0.0.255 area 1
    172.16.2.0 0.0.0.255 area 1
    172.16.3.0 0.0.0.255 area 1
    172.16.10.0 0.0.0.255 area 0
    172.16.20.0 0.0.0.255 area 0
    172.16.99.0 0.0.0.255 area 0
    172.16.123.0 0.0.0.3 area 0
  Passive Interface(s):
    GigabitEthernet0/0
    GigabitEthernet0/0.10
    GigabitEthernet0/0.20
```

- show ip ospf

```
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 autonomous system boundary router
 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 3
       Area has no authentication
       SPF algorithm executed 7 times
       Area ranges are
       Number of LSA 9. Checksum Sum 0x035b29
       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 4
       Area has message digest authentication
       SPF algorithm executed 9 times
       Area ranges are
       Number of LSA 8. Checksum Sum 0x04f5ed
```

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

- show ip ospf neighbors

R1#show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
2.2.2.2	0	FULL/ -	00:00:19	172.16.123.2	Serial0/0/0

- 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	1509	0x8000000a	0x0093bd	5
3.3.3.3	3.3.3.3	1511	0x8000000a	0x00de59	5
2.2.2.2	2.2.2.2	1511	0x80000008	0x007d9b	4

Summary Net Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum
172.16.1.1	1.1.1.1	1515	0x80000010	0x00bccf
172.16.2.1	1.1.1.1	1515	0x80000011	0x00afda
172.16.3.1	1.1.1.1	1515	0x80000012	0x00a2e5
172.16.4.0	3.3.3.3	1511	0x80000034	0x00124f

Summary ASB Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum
2.2.2.2	1.1.1.1	1521	0x8000000f	0x00e45f

Router Link States (Area 1)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
1.1.1.1	1.1.1.1	1522	0x80000007	0x0006db	3

Summary Net Link States (Area 1)

Link ID	ADV Router	Age	Seq#	Checksum
172.16.10.0	1.1.1.1	1499	0x80000024	0x003b35
172.16.20.0	1.1.1.1	1499	0x80000025	0x00ca9a
172.16.99.0	1.1.1.1	1499	0x80000026	0x0060b4
172.16.123.0	1.1.1.1	1499	0x80000027	0x00bb04
172.16.123.4	1.1.1.1	1495	0x8000002a	0x001068
172.16.4.0	1.1.1.1	1495	0x8000002b	0x00658c

Summary ASB Link States (Area 1)

Link ID	ADV Router	Age	Seq#	Checksum
2.2.2.2	1.1.1.1	1495	0x80000028	0x0035b5
3.3.3.3	1.1.1.1	1495	0x80000029	0x00871e

- show ip ospf interface <interface>

R1#show ip ospf interface serial 0/0/0

Serial0/0/0 is up, line protocol is up

Internet address is 172.16.123.1/30, 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 00:00:04
Index 4/4, 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

- show ip ospf interface brief

(No suportado en PKT)

- show ip bgp summary

(No configurado en el dispositivo)

- show ip bgp

(No configurado en el dispositivo)

- show ip nat statistics

(No configurado en el dispositivo)

- show ip nat translations

(No configurado en el dispositivo)

- show ip dhcp binding

(No configurado en el dispositivo)

- show ip dhcp pool

(No configurado en el dispositivo)

- show ip access-lists

R1#show ip access-lists
Extended IP access list 101
10 deny tcp 172.16.20.0 0.0.0.255 host 172.16.10.1 eq 22
20 deny tcp 172.16.99.0 0.0.0.255 host 172.16.10.1 eq 22
30 permit ip any any (10726 match(es))
40 deny tcp 172.16.20.0 0.0.0.255 host 172.16.10.1 eq telnet
50 deny tcp 172.16.99.0 0.0.0.255 host 172.16.10.1 eq telnet

- show ntp status

R1#show ntp status
Clock is unsynchronized, stratum 16, no reference clock
nominal freq is 250.0000 Hz, actual freq is 249.9990 Hz, precision is 2**24
reference time is 00000000.00000000 (00:00:00.000 UTC Mon Jan 1 1990)
clock offset is 0.00 msec, root delay is 0.00 msec
root dispersion is 0.00 msec, peer dispersion is 0.00 msec.
loopfilter state is 'FSET' (Drift set from file), drift is - 0.000001193 s/s system poll interval is 4, never updated.

- show logging

R1#show logging
Syslog logging: enabled (0 messages dropped, 0 messages rate-limited,

0 flushes, 0 overruns, xml disabled, filtering disabled)

No Active Message Discriminator.

No Inactive Message Discriminator.

Console logging: level debugging, 15 messages logged, xml disabled,
filtering disabled
Monitor logging: level debugging, 15 messages logged, xml disabled,
filtering disabled
Buffer logging: disabled, xml disabled,
filtering disabled

Logging Exception size (4096 bytes)
Count and timestamp logging messages: disabled
Persistent logging: disabled

No active filter modules.

ESM: 0 messages dropped
Trap logging: level informational, 15 message lines logged
Logging to 172.18.10.100 (udp port 514, audit disabled,
authentication disabled, encryption disabled, link up),
15 message lines logged,
0 message lines rate-limited,
0 message lines dropped-by-MD,
xml disabled, sequence number disabled
filtering disabled

Router 2

- show cdp neighbors

```
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   Holdtme    Capability   Platform    Port ID
R1           Ser 0/0/1       162            R       C1900       Ser 0/0/0
```

- show ip interface brief

```
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
Serial0/0/0            172.16.123.5    YES manual up                    up
Serial0/0/1            172.16.123.2    YES manual up                    up
Serial0/1/0            209.165.200.225 YES manual up                      up
Serial0/1/1            unassigned      YES unset  administratively down down
Tunnel0                172.17.1.1      YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
```

- show interface <type_slot_port>

```
R2#show ip interface serial 0/0/0
Serial0/0/0 is up, line protocol is up (connected)
```

Internet address is 172.16.123.5/30
Broadcast address is 255.255.255.255
Address determined by setup command
MTU is 1500
Helper address is not set
Directed broadcast forwarding is disabled
Outgoing access list is not set
Inbound access list is 150
Proxy ARP is enabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachables are always sent
ICMP mask replies are never sent
IP fast switching is disabled
IP fast switching on the same interface is disabled
IP Flow switching is disabled
IP Fast switching turbo vector
IP multicast fast switching is disabled
IP multicast distributed fast switching is disabled
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
WCCP Redirect outbound is disabled
WCCP Redirect exclude is disabled
BGP Policy Mapping is disabled

R2#show ip interface serial 0/0/1
Serial0/0/1 is up, line protocol is up (connected)
Internet address is 172.16.123.2/30
Broadcast address is 255.255.255.255
Address determined by setup command
MTU is 1500
Helper address is not set
Directed broadcast forwarding is disabled
Outgoing access list is not set
Inbound access list is 150
Proxy ARP is enabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachables are always sent

ICMP mask replies are never sent
IP fast switching is disabled
IP fast switching on the same interface is disabled
IP Flow switching is disabled
IP Fast switching turbo vector
IP multicast fast switching is disabled
IP multicast distributed fast switching is disabled
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
WCCP Redirect outbound is disabled
WCCP Redirect exclude is disabled
BGP Policy Mapping is disabled

R2#show ip interface serial 0/1/0
Serial0/1/0 is up, line protocol is up (connected)
Internet address is 209.165.200.225/30
Broadcast address is 255.255.255.255
Address determined by setup command
MTU is 1500
Helper address is not set
Directed broadcast forwarding is disabled
Outgoing access list is not set
Inbound access list is not set
Proxy ARP is enabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachables are always sent
ICMP mask replies are never sent
IP fast switching is disabled
IP fast switching on the same interface is disabled
IP Flow switching is disabled
IP Fast switching turbo vector
IP multicast fast switching is disabled
IP multicast distributed fast switching is disabled
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled

Network address translation is disabled
WCCP Redirect outbound is disabled
WCCP Redirect exclude is disabled
BGP Policy Mapping is disabled

R2#show ip interface tunnel 0
Tunnel0 is up, line protocol is up
Internet address is 172.17.1.1/30
Broadcast address is 255.255.255.255
Address determined by setup command
MTU is 1476 bytes
Helper address is not set
Directed broadcast forwarding is disabled
Outgoing access list is not set
Inbound access list is not set
Proxy ARP is enabled
Local Proxy ARP is disabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachables are always sent
ICMP mask replies are never sent
IP fast switching is enabled
IP fast switching on the same interface is disabled
IP Flow switching is disabled
IP CEF switching is enabled
IP CEF switching turbo vector
IP Null turbo vector
IP multicast fast switching is enabled
IP multicast distributed fast switching is disabled
IP route-cache flags are Fast, CEF
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Policy routing is disabled
Network address translation is disabled
BGP Policy Mapping is disabled
Input features: MCI Check
WCCP Redirect outbound is disabled
WCCP Redirect inbound is disabled
WCCP Redirect exclude is disabled

- show versión

R2#show version
Cisco IOS Software, C1900 Software (C1900-UNIVERSALK9-M), Version 15.1(4)M4, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.

Compiled Wed 23-Feb-11 14:19 by pt_team

ROM: System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
cisco1941 uptime is 2 hours, 35 minutes, 59 seconds
System returned to ROM by power-on
System image file is "flash0:c1900-universalk9-mz.SPA.151-1.M4.bin"
Last reload type: Normal Reload

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to export@cisco.com.
Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
4 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

License Info:

License UDI:

Device#	PID	SN
*0	CISCO1941/K9	FTX1524MXRR-

Technology Package License Information for Module:'c1900'

Technology	Technology-package Current	Type	Technology-package Next reboot
ipbase	ipbasek9	Permanent	ipbasek9
security	disable	None	None
data	disable	None	None

Configuration register is 0x2102

- show startup-config

R2#show startup-config
Using 3564 bytes

```
!
version 15.1
service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
security passwords min-length 10
!
hostname R2
!
!
!
enable secret 5 $1$mERr$TfFTxE.mmb5O5BVC56ndL0
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
username ISP password 7 08315C5E393835121C080D14
username admin01 password 7 0820484300175546020A1F17
username adminSSH password 7 08204843001736243A1B0D1739
!
!
license udi pid CISCO1941/K9 sn FTX1524MXRR-
!
!
!
!
!
!
!
!
!
!
no ip domain-lookup
ip domain-name CCNA4_CS4.com
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Tunnel0
 ip address 172.17.1.1 255.255.255.252
 mtu 1476
 tunnel source Serial0/1/0
 tunnel destination 209.165.200.230
```

```
!
!
interface GigabitEthernet0/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 description R2 -----------> R3
 ip address 172.16.123.5 255.255.255.252
 ip ospf message-digest-key 1 md5 routingOSPF
 ip ospf hello-interval 5
 ip ospf dead-interval 20
 ip access-group 150 in
 ip nat inside
 clock rate 128000
!
interface Serial0/0/1
 description R2 -----------> R1
 ip address 172.16.123.2 255.255.255.252
 ip ospf message-digest-key 1 md5 routingOSPF
 ip ospf hello-interval 5
 ip ospf dead-interval 20
 ip access-group 150 in
 ip nat inside
 clock rate 2000000
!
interface Serial0/1/0
 description R2 -----------> ISP
 ip address 209.165.200.225 255.255.255.252
 ip nat outside
!
interface Serial0/1/1
 no ip address
 clock rate 2000000
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
router ospf 10
 router-id 2.2.2.2
 log-adjacency-changes
 area 0 authentication message-digest
 passive-interface default
 no passive-interface Serial0/0/0
```

```
 no passive-interface Serial0/0/1
 network 172.16.123.0 0.0.0.3 area 0
 network 172.16.123.4 0.0.0.3 area 0
 default-information originate
!
router bgp 65100
 bgp log-neighbor-changes
 no synchronization
 neighbor 209.165.200.226 remote-as 65401
 network 209.165.200.224 mask 255.255.255.252
 redistribute static
!
ip nat pool salesNET 1.1.1.1 1.1.1.2 netmask 255.255.255.248
ip nat inside source list 1 pool salesNET overload
ip nat inside source static 172.16.20.20 1.1.1.4
ip classless
ip route 0.0.0.0 0.0.0.0 209.165.200.226
ip route 172.18.0.0 255.255.0.0 172.17.1.2
ip route 1.1.1.0 255.255.255.248 Null0
!
ip flow-export version 9
!
!
access-list 1 permit 172.16.10.0 0.0.0.255
access-list 100 permit ip 172.16.10.0 0.0.0.255 200.200.200.0 0.0.0.255
ip access-list extended web
 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq www
 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq 443
 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq www
 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq 443
 permit ip any any
access-list 150 deny tcp 172.16.10.0 0.0.0.255 host 200.200.200.100 eq 20
access-list 150 deny tcp 172.16.10.0 0.0.0.255 host 200.200.200.100 eq ftp
access-list 150 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq 20
access-list 150 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq ftp
access-list 150 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq ftp
access-list 150 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq 20
access-list 150 permit ip any any
!
banner motd ^Chis is R2 CLI
^C
!
!
!
!
!
logging trap debugging
logging 172.18.10.100
line con 0
 login local
!
line aux 0
!
line vty 0 4
```

```
 login
 transport input ssh
line vty 5 15
 login
 transport input ssh
!
!
ntp server 200.200.200.100
ntp update-calendar
!
end
```

- show standby

(No configurado en el dispositivo)

- show standby brief

(No configurado en el dispositivo)

- show ip route

```
R2#show standby brief
                     P indicates configured to preempt.
                     |
Interface   Grp  Pri P State    Active          Standby         Virtual IP
R2#show ip rou
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 209.165.200.226 to network 0.0.0.0

     1.0.0.0/29 is subnetted, 1 subnets
S       1.1.1.0/29 is directly connected, Null0
     172.16.0.0/16 is variably subnetted, 11 subnets, 4 masks
O IA    172.16.1.1/32 [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
O IA    172.16.2.1/32 [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
O IA    172.16.3.1/32 [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
O IA    172.16.4.0/22 [110/65] via 172.16.123.6, 4294967295:4294967261:4294967239, Serial0/0/0
O       172.16.10.0/24 [110/65] via 172.16.123.6, 4294967295:4294967261:4294967239, Serial0/0/0
                       [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
O       172.16.20.0/24 [110/65] via 172.16.123.6, 4294967295:4294967261:4294967239, Serial0/0/0
                       [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
O       172.16.99.0/24 [110/65] via 172.16.123.6, 4294967295:4294967261:4294967239, Serial0/0/0
                       [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
C       172.16.123.0/30 is directly connected, Serial0/0/1
L       172.16.123.2/32 is directly connected, Serial0/0/1
C       172.16.123.4/30 is directly connected, Serial0/0/0
L       172.16.123.5/32 is directly connected, Serial0/0/0
     172.17.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.17.1.0/30 is directly connected, Tunnel0
L       172.17.1.1/32 is directly connected, Tunnel0
S    172.18.0.0/16 [1/0] via 172.17.1.2
     209.165.200.0/24 is variably subnetted, 4 subnets, 2 masks
```

```
C       209.165.200.224/30 is directly connected, Serial0/1/0
L       209.165.200.225/32 is directly connected, Serial0/1/0
C       209.165.200.226/32 is directly connected, Serial0/1/0
B       209.165.200.228/30 [20/0] via 209.165.200.226, 00:00:00
S*   0.0.0.0/0 [1/0] via 209.165.200.226
```

- show ip protocols

```
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 209.165.200.226 to network 0.0.0.0

     1.0.0.0/29 is subnetted, 1 subnets
S       1.1.1.0/29 is directly connected, Null0
     172.16.0.0/16 is variably subnetted, 11 subnets, 4 masks
O IA    172.16.1.1/32 [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
O IA    172.16.2.1/32 [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
O IA    172.16.3.1/32 [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
O IA    172.16.4.0/22 [110/65] via 172.16.123.6, 4294967295:4294967261:4294967239, Serial0/0/0
O       172.16.10.0/24 [110/65] via 172.16.123.6, 4294967295:4294967261:4294967239, Serial0/0/0
                       [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
O       172.16.20.0/24 [110/65] via 172.16.123.6, 4294967295:4294967261:4294967239, Serial0/0/0
                       [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
O       172.16.99.0/24 [110/65] via 172.16.123.6, 4294967295:4294967261:4294967239, Serial0/0/0
                       [110/65] via 172.16.123.1, 4294967295:4294967261:4294967239, Serial0/0/1
C       172.16.123.0/30 is directly connected, Serial0/0/1
L       172.16.123.2/32 is directly connected, Serial0/0/1
C       172.16.123.4/30 is directly connected, Serial0/0/0
L       172.16.123.5/32 is directly connected, Serial0/0/0
     172.17.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.17.1.0/30 is directly connected, Tunnel0
L       172.17.1.1/32 is directly connected, Tunnel0
S    172.18.0.0/16 [1/0] via 172.17.1.2
     209.165.200.0/24 is variably subnetted, 4 subnets, 2 masks
C       209.165.200.224/30 is directly connected, Serial0/1/0
L       209.165.200.225/32 is directly connected, Serial0/1/0
C       209.165.200.226/32 is directly connected, Serial0/1/0
B       209.165.200.228/30 [20/0] via 209.165.200.226, 00:00:00
S*   0.0.0.0/0 [1/0] via 209.165.200.226

R2#show ip pro
R2#show ip protocols
Routing Protocol is "bgp 65100"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  IGP synchronization is disabled
  Automatic route summarization is disabled
  Neighbor(s):
    Address          FiltIn FiltOut DistIn DistOut Weight RouteMap
```

```
    209.165.200.226
  Maximum path: 1
    Routing Information Sources:
      Gateway         Distance      Last Update
      209.165.200.226              20          00:00:00
    Distance: external 20 internal 200 local 200

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:
    172.16.123.0 0.0.0.3 area 0
    172.16.123.4 0.0.0.3 area 0
  Passive Interface(s):
    Vlan1
    GigabitEthernet0/0
    GigabitEthernet0/1
    Serial0/1/0
    Serial0/1/1
    Tunnel0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1              110      00:00:00
    2.2.2.2              110      00:00:00
    3.3.3.3              110      00:00:00
  Distance: (default is 110)
```

- show ip ospf

```
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 1. Checksum Sum 0x00e0e9
 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 2
        Area has message digest authentication
        SPF algorithm executed 14 times
        Area ranges are
        Number of LSA 10. Checksum Sum 0x06c04b
        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
```

- show ip ospf neighbors

```
R2#show ip ospf neighbor
Neighbor ID     Pri   State           Dead Time   Address         Interface
3.3.3.3           0   FULL/  -        00:00:18    172.16.123.6    Serial0/0/0
1.1.1.1           0   FULL/  -        00:00:18    172.16.123.1    Serial0/0/1
```

- show ip ospf database

```
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
3.3.3.3         3.3.3.3         0           0x8000000b 0x00dc5a 5
2.2.2.2         2.2.2.2         0           0x8000000c 0x00759f 4
1.1.1.1         1.1.1.1         0           0x8000000d 0x008dc0 5

           Summary Net Link States (Area 0)
Link ID         ADV Router      Age         Seq#       Checksum
172.16.1.1      1.1.1.1         0           0x80000014 0x00b4d3
172.16.2.1      1.1.1.1         0           0x80000015 0x00a7de
172.16.3.1      1.1.1.1         0           0x80000016 0x009ae9
172.16.4.0      3.3.3.3         0           0x80000041 0x00f75c

           Summary ASB Link States (Area 0)
Link ID         ADV Router      Age         Seq#       Checksum
2.2.2.2         2.2.2.2         3600        0x80000001 0x00e26b
2.2.2.2         3.3.3.3         0           0x8000004a 0x0032ce
2.2.2.2         1.1.1.1         3600        0x80000013 0x00dc63

           Type-5 AS External Link States
Link ID         ADV Router      Age         Seq#       Checksum Tag
0.0.0.0         2.2.2.2         3600        0x80000001 0x00e0e9 1
```

- show ip ospf interface <interface>

```
R2#show ip ospf interface serial 0/0/0

Serial0/0/0 is up, line protocol is up
  Internet address is 172.16.123.5/30, 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 00:00:00
  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 3.3.3.3
  Suppress hello for 0 neighbor(s)
  Message digest authentication enabled
    Youngest key id is 1
```

```
R2#show ip ospf interface serial 0/0/1

Serial0/0/1 is up, line protocol is up
```

```
Internet address is 172.16.123.2/30, 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 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
Suppress hello for 0 neighbor(s)
Message digest authentication enabled
  Youngest key id is 1
```

- show ip ospf interface brief

(No suportado por PKT)

- show ip bgp summary

R2#show ip bgp summary

BGP router identifier 209.165.200.225, local AS number 65100

BGP table version is 12, main routing table version 6

5 network entries using 660 bytes of memory

5 path entries using 260 bytes of memory

1/1 BGP path/bestpath attribute entries using 184 bytes of memory

3 BGP AS-PATH entries using 72 bytes of memory

0 BGP route-map cache entries using 0 bytes of memory

0 BGP filter-list cache entries using 0 bytes of memory

Bitfield cache entries: current 1 (at peak 1) using 32 bytes of memory

BGP using 1208 total bytes of memory

BGP activity 5/0 prefixes, 5/0 paths, scan interval 60 secs

Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd

209.165.200.226 4 65401 176 173 12 0 0 199591902:25:51 4

- show ip bgp

R2#show ip bgp

```
BGP table version is 12, local router ID is 209.165.200.225
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf Weight Path
*> 0.0.0.0/0        209.165.200.226          0     0     0 65100 ?
*> 1.1.1.0/29       0.0.0.0                  0     0     0 65100 ?
*> 172.18.0.0/16    172.17.1.2               0     0     0 65100 ?
*> 209.165.200.224/300.0.0.0                 0     0 32768 i
*> 209.165.200.228/30209.165.200.226         0     0     0 65401 65101 i
```

- show ip nat statistics

```
R2#show ip nat statistics
Total translations: 1 (1 static, 0 dynamic, 0 extended)
Outside Interfaces: Serial0/1/0
Inside Interfaces: Serial0/0/0 , Serial0/0/1
Hits: 0  Misses: 4231
Expired translations: 0
Dynamic mappings:
-- Inside Source
access-list 1 pool salesNET refCount 0
 pool salesNET: netmask 255.255.255.248
     start 1.1.1.1 end 1.1.1.2
     type generic, total addresses 2 , allocated 0 (0%), misses 0
```

- show ip nat translations

```
R2#show ip nat statistics
Total translations: 1 (1 static, 0 dynamic, 0 extended)
Outside Interfaces: Serial0/1/0
Inside Interfaces: Serial0/0/0 , Serial0/0/1
Hits: 0  Misses: 4231
Expired translations: 0
Dynamic mappings:
-- Inside Source
access-list 1 pool salesNET refCount 0
 pool salesNET: netmask 255.255.255.248
     start 1.1.1.1 end 1.1.1.2
     type generic, total addresses 2 , allocated 0 (0%), misses 0
R2#show ip nat tra
R2#show ip nat translations
Pro  Inside global     Inside local       Outside local      Outside global
---  1.1.1.4           172.16.20.20       ---                ---
```

- show ip dhcp binding

```
(No configurado en el dispositivo)
```

- show ip dhcp pool

```
(No configurado en el dispositivo)
```

- show ip access-lists

```
R2#show ip access-lists
Standard IP access list 1
   10 permit 172.16.10.0 0.0.0.255
Extended IP access list 100
   10 permit ip 172.16.10.0 0.0.0.255 200.200.200.0 0.0.0.255
Extended IP access list web
```

10 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq www
20 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq 443
30 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq www
40 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq 443
50 permit ip any any
Extended IP access list 150
10 deny tcp 172.16.10.0 0.0.0.255 host 200.200.200.100 eq 20
20 deny tcp 172.16.10.0 0.0.0.255 host 200.200.200.100 eq ftp
30 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq 20
40 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq ftp
50 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq ftp
60 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq 20
70 permit ip any any (5683 match(es))

- show ntp status

R2#show ntp status
Clock is synchronized, stratum 2, reference is 200.200.200.100
nominal freq is 250.0000 Hz, actual freq is 249.9990 Hz, precision is 2**24
reference time is 0C6E0A19.00000374 (20:39:53.884 UTC ju. jul. 11 2019)
clock offset is 0.00 msec, root delay is 2.00 msec
root dispersion is 173.82 msec, peer dispersion is 0.12 msec.
loopfilter state is 'CTRL' (Normal Controlled Loop), drift is - 0.000001193 s/s system poll interval is 4, last update was 1 sec ago.

- show logging

R2#show logging
Syslog logging: enabled (0 messages dropped, 0 messages rate-limited,
0 flushes, 0 overruns, xml disabled, filtering disabled)

No Active Message Discriminator.

No Inactive Message Discriminator.

Console logging: level debugging, 19 messages logged, xml disabled,
filtering disabled
Monitor logging: level debugging, 19 messages logged, xml disabled,
filtering disabled
Buffer logging: disabled, xml disabled,
filtering disabled

Logging Exception size (4096 bytes)
Count and timestamp logging messages: disabled
Persistent logging: disabled

No active filter modules.

ESM: 0 messages dropped
Trap logging: level debugging, 19 message lines logged
Logging to 172.18.10.100 (udp port 514, audit disabled,
authentication disabled, encryption disabled, link up),
19 message lines logged,
0 message lines rate-limited,
0 message lines dropped-by-MD,
xml disabled, sequence number disabled

filtering disabled

Router 3

- show cdp neighbors

```
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
R2           Ser 0/0/1       174           R      C1900       Ser 0/0/0
SW3          Gig 0/0.99      175           S      2960        Fas 0/5
```

- show ip interface brief

- show interface <type_slot_port>

```
R3#show ip interface serial 0/0/1
Serial0/0/1 is up, line protocol is up (connected)
  Internet address is 172.16.123.6/30
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound  access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachables are always sent
  ICMP mask replies are never sent
  IP fast switching is disabled
  IP fast switching on the same interface is disabled
  IP Flow switching is disabled
  IP Fast switching turbo vector
  IP multicast fast switching is disabled
  IP multicast distributed fast switching is disabled
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Probe proxy name replies are disabled
  Policy routing is disabled
  Network address translation is disabled
  WCCP Redirect outbound is disabled
  WCCP Redirect exclude is disabled
  BGP Policy Mapping is disabled
```

```
R3#show interfaces gigabitEthernet 0/0.10
GigabitEthernet0/0.10 is up, line protocol is up (connected)
```

Hardware is PQUICC_FEC, address is 00e0.b023.46c7 (bia 00e0.b023.46c7)
Internet address is 172.16.10.3/24
MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation 802.1Q Virtual LAN, Vlan ID 10
ARP type: ARPA, ARP Timeout 04:00:00,
Last clearing of "show interface" counters never

- show versión

```
R3#show version
Cisco IOS Software, C1900 Software (C1900-UNIVERSALK9-M), Version 15.1(4)M4, RELEASE SOFTWARE
(fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 23-Feb-11 14:19 by pt_team

ROM: System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
cisco1941 uptime is 3 hours, 11 minutes, 6 seconds
System returned to ROM by power-on
System image file is "flash0:c1900-universalk9-mz.SPA.151-1.M4.bin"
Last reload type: Normal Reload

This product contains cryptographic features and is subject to United
States and local country laws governing import, export, transfer and
use. Delivery of Cisco cryptographic products does not imply
third-party authority to import, export, distribute or use encryption.
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.
Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
4 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

License Info:

License UDI:

-------------------------------------------------
Device#   PID               SN
-------------------------------------------------
*0        CISCO1941/K9      FTX15241D06-
```

Technology Package License Information for Module:'c1900'

Technology	Technology-package Current	Type	Technology-package Next reboot
ipbase	ipbasek9	Permanent	ipbasek9
security	disable	None	None
data	disable	None	None

Configuration register is 0x2102

- show startup-config

```
R3#show startup-config
Using 2780 bytes
!
version 15.1
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.mmb5O5BVC56ndL0
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
username admin01 password 7 0820484300175546020A1F17
username adminSSH password 7 0820484300173624 3A1B0D1739
!
!
license udi pid CISCO1941/K9 sn FTX15241D06-
!
!
!
!
!
!
!
!
!
!
no ip domain-lookup
ip domain-name CCNA_CS4.com
!
```

```
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback4
 ip address 172.16.4.1 255.255.255.0
!
interface Loopback5
 ip address 172.16.5.1 255.255.255.0
!
interface Loopback6
 ip address 172.16.6.1 255.255.255.0
!
interface GigabitEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/0.10
 description Lan 10
 encapsulation dot1Q 10
 ip address 172.16.10.3 255.255.255.0
 ip helper-address 172.17.1.2
 ip helper-address 172.18.10.1
 standby 1 ip 172.16.10.2
 standby 1 priority 101
 standby preempt
!
interface GigabitEthernet0/0.20
 description Lan 20
 encapsulation dot1Q 20
 ip address 172.16.20.3 255.255.255.0
 standby 2 ip 172.16.20.2
!
interface GigabitEthernet0/0.99
 encapsulation dot1Q 99 native
 ip address 172.16.99.3 255.255.255.0
 standby 3 ip 172.16.99.2
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 no ip address
 clock rate 2000000
 shutdown
!
```

```
interface Serial0/0/1
 ip address 172.16.123.6 255.255.255.252
 ip ospf message-digest-key 1 md5 routingOSPF
 ip ospf hello-interval 5
 ip ospf dead-interval 20
!
interface Serial0/1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial0/1/1
 no ip address
 clock rate 2000000
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
router ospf 10
 router-id 3.3.3.3
 log-adjacency-changes
 area 2 range 172.16.4.0 255.255.252.0
 area 2 authentication message-digest
 area 0 authentication message-digest
 redistribute connected
 passive-interface GigabitEthernet0/0
 passive-interface GigabitEthernet0/0.10
 passive-interface GigabitEthernet0/0.20
 passive-interface GigabitEthernet0/0.99
 network 172.16.4.0 0.0.0.255 area 2
 network 172.16.5.0 0.0.0.255 area 2
 network 172.16.6.0 0.0.0.255 area 2
 network 172.16.10.0 0.0.0.255 area 0
 network 172.16.20.0 0.0.0.255 area 0
 network 172.16.99.0 0.0.0.255 area 0
 network 172.16.123.4 0.0.0.3 area 0
 default-information originate
!
ip classless
!
ip flow-export version 9
!
!
!
banner motd ^Chis is R3 CLI.
^C
!
!
!
!
!
logging 172.18.10.100
```

```
line con 0
 login local
!
line aux 0
!
line vty 0 4
 login local
 transport input ssh
 transport output ssh
line vty 5 15
 login local
 transport input ssh
 transport output ssh
!
!
ntp server 200.200.200.100
ntp update-calendar
!
end
```

- show standby

```
R3#show standby
GigabitEthernet0/0.10 - Group 1
  State is Active
    5 state changes, last state change 00:00:28
  Virtual IP address is 172.16.10.2
  Active virtual MAC address is 0000.0C07.AC01
    Local virtual MAC address is 0000.0C07.AC01 (v1 default)
  Hello time 3 sec, hold time 10 sec
    Next hello sent in 1.117 secs
  Preemption disabled
  Active router is local
  Standby router is 172.16.10.1
  Priority 101 (configured 101)
  Group name is hsrp-Gig-1 (default)
GigabitEthernet0/0.20 - Group 2
  State is Standby
    7 state changes, last state change 00:00:38
  Virtual IP address is 172.16.20.2
  Active virtual MAC address is 0000.0C07.AC02
    Local virtual MAC address is 0000.0C07.AC02 (v1 default)
  Hello time 3 sec, hold time 10 sec
    Next hello sent in 0.824 secs
  Preemption disabled
  Active router is 172.16.20.1
  Standby router is local
  Priority 100 (default 100)
  Group name is hsrp-Gig-2 (default)
GigabitEthernet0/0.99 - Group 3
  State is Standby
    9 state changes, last state change 00:00:40
  Virtual IP address is 172.16.99.2
  Active virtual MAC address is 0000.0C07.AC03
    Local virtual MAC address is 0000.0C07.AC03 (v1 default)
  Hello time 3 sec, hold time 10 sec
```

```
  Next hello sent in 0.235 secs
 Preemption disabled
 Active router is 172.16.99.1, priority 101 (expires in 7 sec)
  MAC address is 0000.0C07.AC03
 Standby router is local
 Priority 100 (default 100)
 Group name is hsrp-Gig-3 (default)
```

- show standby brief

```
R3#show standby brief
                     P indicates configured to preempt.
                     |
Interface   Grp  Pri P State    Active          Standby         Virtual IP
Gig         1    101   Active   local           172.16.10.1     172.16.10.2
Gig         2    100   Standby  172.16.20.1     local           172.16.20.2
Gig         3    100   Standby  172.16.99.1     local           172.16.99.2
```

- show ip route

```
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, 18 subnets, 3 masks
O IA    172.16.1.1/32 [110/129] via 172.16.123.5, 02:58:55, Serial0/0/1
O IA    172.16.2.1/32 [110/129] via 172.16.123.5, 02:58:55, Serial0/0/1
O IA    172.16.3.1/32 [110/129] via 172.16.123.5, 02:58:55, Serial0/0/1
C       172.16.4.0/24 is directly connected, Loopback4
L       172.16.4.1/32 is directly connected, Loopback4
C       172.16.5.0/24 is directly connected, Loopback5
L       172.16.5.1/32 is directly connected, Loopback5
C       172.16.6.0/24 is directly connected, Loopback6
L       172.16.6.1/32 is directly connected, Loopback6
C       172.16.10.0/24 is directly connected, GigabitEthernet0/0.10
L       172.16.10.3/32 is directly connected, GigabitEthernet0/0.10
C       172.16.20.0/24 is directly connected, GigabitEthernet0/0.20
L       172.16.20.3/32 is directly connected, GigabitEthernet0/0.20
C       172.16.99.0/24 is directly connected, GigabitEthernet0/0.99
L       172.16.99.3/32 is directly connected, GigabitEthernet0/0.99
O       172.16.123.0/30 [110/128] via 172.16.123.5, 02:58:55, Serial0/0/1
C       172.16.123.4/30 is directly connected, Serial0/0/1
L       172.16.123.6/32 is directly connected, Serial0/0/1
```

- show ip protocols

```
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
  It is an autonomous system boundary router
```

```
 Redistributing External Routes from,
   connected
 Number of areas in this router is 2. 2 normal 0 stub 0 nssa
 Maximum path: 4
 Routing for Networks:
   172.16.4.0 0.0.0.255 area 2
   172.16.5.0 0.0.0.255 area 2
   172.16.6.0 0.0.0.255 area 2
   172.16.10.0 0.0.0.255 area 0
   172.16.20.0 0.0.0.255 area 0
   172.16.99.0 0.0.0.255 area 0
   172.16.123.4 0.0.0.3 area 0
 Passive Interface(s):
   GigabitEthernet0/0
   GigabitEthernet0/0.10
   GigabitEthernet0/0.20
   GigabitEthernet0/0.99
 Routing Information Sources:
   Gateway         Distance      Last Update
   1.1.1.1              110      00:24:34
   2.2.2.2              110      00:54:36
   3.3.3.3              110      00:00:22
 Distance: (default is 110)
```

- show ip ospf

```
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 autonomous system boundary router
 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 2
      Number of interfaces in this area is 3
      Area has message digest authentication
      SPF algorithm executed 3 times
      Area ranges are
      Number of LSA 11. Checksum Sum 0x066df8
      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 4
      Area has message digest authentication
      SPF algorithm executed 19 times
      Area ranges are
```

Number of LSA 8. Checksum Sum 0x0493b4
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

- show ip ospf neighbors

```
R3#show ip ospf neighbor
Neighbor ID     Pri   State           Dead Time   Address         Interface
2.2.2.2           0   FULL/  -        00:00:15    172.16.123.5    Serial0/0/1
```

- show ip ospf database

```
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         91          0x8000000d 0x00d85c 5
2.2.2.2         2.2.2.2         3345        0x8000000c 0x00759f 4
1.1.1.1         1.1.1.1         1543        0x8000000e 0x008bc1 5

           Summary Net Link States (Area 0)
Link ID         ADV Router      Age         Seq#       Checksum
172.16.4.0      3.3.3.3         91          0x80000059 0x00c774
172.16.1.1      1.1.1.1         95          0x8000001a 0x00a8d9
172.16.2.1      1.1.1.1         95          0x8000001b 0x009be4
172.16.3.1      1.1.1.1         95          0x8000001c 0x008eef

           Summary ASB Link States (Area 0)
Link ID         ADV Router      Age         Seq#       Checksum
2.2.2.2         3.3.3.3         1549        0x80000054 0x001ed8

           Router Link States (Area 2)

Link ID         ADV Router      Age         Seq#       Checksum Link count
3.3.3.3         3.3.3.3         102         0x8000000a 0x0025a0 3

           Summary Net Link States (Area 2)
Link ID         ADV Router      Age         Seq#       Checksum
172.16.10.0     3.3.3.3         95          0x8000004d 0x00ac92
172.16.20.0     3.3.3.3         95          0x8000004e 0x003cf7
172.16.99.0     3.3.3.3         95          0x8000004f 0x00d112
172.16.123.4    3.3.3.3         79          0x80000051 0x000386
172.16.123.0    3.3.3.3         79          0x80000052 0x00aba0
172.16.1.1      3.3.3.3         79          0x80000053 0x00fec1
172.16.2.1      3.3.3.3         79          0x80000054 0x00f1cc
172.16.3.1      3.3.3.3         79          0x80000055 0x00e4d7

           Summary ASB Link States (Area 2)
Link ID         ADV Router      Age         Seq#       Checksum
1.1.1.1         3.3.3.3         79          0x80000050 0x005925
2.2.2.2         3.3.3.3         1537        0x8000004c 0x00b00e
```

- show ip ospf interface <interface>

```
R3#show ip ospf interface s0/0/1

Serial0/0/1 is up, line protocol is up
  Internet address is 172.16.123.6/30, 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 00:00:01
  Index 4/4, 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
```

- show ip ospf interface brief

(No suportado por PKT)

- show ip bgp summary

(No configurado en el dispositivo)

- show ip bgp

(No configurado en el dispositivo)

- show ip nat statistics

(No configurado en el dispositivo)

- show ip nat translations

(No configurado en el dispositivo)

- show ip dhcp binding

(No configurado en el dispositivo)

- show ip dhcp pool

(No configurado en el dispositivo)

- show ip access-lists

(No configurado en el dispositivo)

- show ntp status

```
R3#show ntp status
Clock is unsynchronized, stratum 16, no reference clock
nominal freq is 250.0000 Hz, actual freq is 249.9990 Hz, precision is 2**24
reference time is 00000000.00000000 (00:00:00.000 UTC Mon Jan 1 1990)
clock offset is 0.00 msec, root delay is 0.00  msec
root dispersion is 0.00 msec, peer dispersion is 0.00 msec.
loopfilter state is 'FSET' (Drift set from file), drift is - 0.000001193 s/s system poll interval is 4, never
updated.
```

- show logging

```
R3#show logging
Syslog logging: enabled (0 messages dropped, 0 messages rate-limited,
      0 flushes, 0 overruns, xml disabled, filtering disabled)

No Active Message Discriminator.
```

No Inactive Message Discriminator.

Console logging: level debugging, 18 messages logged, xml disabled,
filtering disabled
Monitor logging: level debugging, 18 messages logged, xml disabled,
filtering disabled
Buffer logging: disabled, xml disabled,
filtering disabled

Logging Exception size (4096 bytes)
Count and timestamp logging messages: disabled
Persistent logging: disabled

No active filter modules.

ESM: 0 messages dropped
Trap logging: level informational, 18 message lines logged
Logging to 172.18.10.100 (udp port 514, audit disabled,
authentication disabled, encryption disabled, link up),
18 message lines logged,
0 message lines rate-limited,
0 message lines dropped-by-MD,
xml disabled, sequence number disabled
filtering disabled

Router ISP

- show cdp neighbors

```
ISP#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
R2           Ser 0/0/1       130           R      C1900       Ser 0/1/0
```

- show ip interface brief

```
ISP#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     200.200.200.1   YES manual up                    up
GigabitEthernet0/1     unassigned      YES unset  administratively down down
Serial0/0/0            209.165.200.229 YES manual up                    up
Serial0/0/1            209.165.200.226 YES manual up                    up
Serial0/1/0            unassigned      YES unset  administratively down down
Serial0/1/1            unassigned      YES unset  administratively down down
Vlan1                  unassigned      YES unset  administratively down down
```

- show interface <type_slot_port>

```
ISP#show ip interface s0/0/0
Serial0/0/0 is up, line protocol is up (connected)
  Internet address is 209.165.200.229/30
  Broadcast address is 255.255.255.255
  Address determined by setup command
```

MTU is 1500
Helper address is not set
Directed broadcast forwarding is disabled
Outgoing access list is not set
Inbound access list is not set
Proxy ARP is enabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachables are always sent
ICMP mask replies are never sent
IP fast switching is disabled
IP fast switching on the same interface is disabled
IP Flow switching is disabled
IP Fast switching turbo vector
IP multicast fast switching is disabled
IP multicast distributed fast switching is disabled
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
WCCP Redirect outbound is disabled
WCCP Redirect exclude is disabled
BGP Policy Mapping is disabled

ISP#show ip interface s0/0/1
Serial0/0/1 is up, line protocol is up (connected)
Internet address is 209.165.200.226/30
Broadcast address is 255.255.255.255
Address determined by setup command
MTU is 1500
Helper address is not set
Directed broadcast forwarding is disabled
Outgoing access list is not set
Inbound access list is not set
Proxy ARP is enabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachables are always sent
ICMP mask replies are never sent
IP fast switching is disabled
IP fast switching on the same interface is disabled
IP Flow switching is disabled

IP Fast switching turbo vector
IP multicast fast switching is disabled
IP multicast distributed fast switching is disabled
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
WCCP Redirect outbound is disabled
WCCP Redirect exclude is disabled
BGP Policy Mapping is disabled

ISP#show ip interface gigabitEthernet 0/0
GigabitEthernet0/0 is up, line protocol is up (connected)
Internet address is 200.200.200.1/24
Broadcast address is 255.255.255.255
Address determined by setup command
MTU is 1500 bytes
Helper address is not set
Directed broadcast forwarding is disabled
Outgoing access list is not set
Inbound access list is not set
Proxy ARP is enabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachables are always sent
ICMP mask replies are never sent
IP fast switching is disabled
IP fast switching on the same interface is disabled
IP Flow switching is disabled
IP Fast switching turbo vector
IP multicast fast switching is disabled
IP multicast distributed fast switching is disabled
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
BGP Policy Mapping is disabled
Input features: MCI Check
WCCP Redirect outbound is disabled

WCCP Redirect inbound is disabled
WCCP Redirect exclude is disabled

- show versión

ISP#show version
Cisco IOS Software, C1900 Software (C1900-UNIVERSALK9-M), Version 15.1(4)M4, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 23-Feb-11 14:19 by pt_team

ROM: System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
cisco1941 uptime is 3 hours, 52 minutes, 36 seconds
System returned to ROM by power-on
System image file is "flash0:c1900-universalk9-mz.SPA.151-1.M4.bin"
Last reload type: Normal Reload

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to export@cisco.com.
Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
4 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

License Info:

License UDI:

Device# PID SN
---
*0 CISCO1941/K9 FTX15244QWZ-

Technology Package License Information for Module:'c1900'

Technology Technology-package Technology-package
Current Type Next reboot
---

ipbase ipbasek9 Permanent ipbasek9
security disable None None
data disable None None

Configuration register is 0x2102

- show startup-config

ISP#show startup-config
Using 1482 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname ISP
!
!
!
enable secret 5 1mERr$TfFTxE.mmb5O5BVC56ndL0
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
username R2 password 0 pppPAPencap
username RemoteCPD password 0 pppCHAPencap
!
!
license udi pid CISCO1941/K9 sn FTX15244QWZ-
!
!
!
!
!
!
!
!
!
!
no ip domain-lookup
!
!
spanning-tree mode pvst
!
!
!
!
!
!

```
interface GigabitEthernet0/0
 ip address 200.200.200.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 ip address 209.165.200.229 255.255.255.252
 encapsulation ppp
 ppp authentication chap
 clock rate 2000000
!
interface Serial0/0/1
 ip address 209.165.200.226 255.255.255.252
 encapsulation ppp
 ppp authentication pap
 ppp pap sent-username ISP password 0 pppPAPencap
 clock rate 2000000
!
interface Serial0/1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial0/1/1
 no ip address
 clock rate 2000000
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
router bgp 65401
 bgp log-neighbor-changes
 no synchronization
 neighbor 209.165.200.225 remote-as 65100
 neighbor 209.165.200.230 remote-as 65101
!
ip classless
!
ip flow-export version 9
!
!
!
banner motd ^Chis is ISP CLI.
^C
!
!
```

```
!
!
!
line con 0
 password ciscoconpa55
 login
!
line aux 0
!
line vty 0 4
 login
!
!
ntp server 200.200.200.100
ntp update-calendar
!
end
```

- show standby

(No configurado en el dispositivo)

- show standby brief

(No configurado en el dispositivo)

- show ip route

```
ISP#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 209.165.200.225 to network 0.0.0.0

 *   0.0.0.0/32 is subnetted, 1 subnets
B*      0.0.0.0/32 [20/0] via 209.165.200.225, 00:00:00
     1.0.0.0/29 is subnetted, 1 subnets
B       1.1.1.0/29 [20/0] via 209.165.200.225, 00:00:00
B    172.18.0.0/16 [20/0] via 209.165.200.225, 00:00:00
     200.200.200.0/24 is variably subnetted, 2 subnets, 2 masks
C       200.200.200.0/24 is directly connected, GigabitEthernet0/0
L       200.200.200.1/32 is directly connected, GigabitEthernet0/0
     209.165.200.0/24 is variably subnetted, 6 subnets, 2 masks
C       209.165.200.224/30 is directly connected, Serial0/0/1
C       209.165.200.225/32 is directly connected, Serial0/0/1
L       209.165.200.226/32 is directly connected, Serial0/0/1
C       209.165.200.228/30 is directly connected, Serial0/0/0
L       209.165.200.229/32 is directly connected, Serial0/0/0
C       209.165.200.230/32 is directly connected, Serial0/0/0
```

- show ip protocols

```
ISP#show ip protocols
Routing Protocol is "bgp 65401"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
```

IGP synchronization is disabled
Automatic route summarization is disabled
Neighbor(s):
Address FiltIn FiltOut DistIn DistOut Weight RouteMap
209.165.200.225
209.165.200.230
Maximum path: 1
Routing Information Sources:
Gateway Distance Last Update
209.165.200.230 20 00:00:00
209.165.200.225 20 00:00:00
Distance: external 20 internal 200 local 200

- show ip ospf

(No configurado en el dispositivo)

- show ip ospf neighbors

(No configurado en el dispositivo)

- show ip ospf database

(No configurado en el dispositivo)

- show ip ospf interface <interface>

(No configurado en el dispositivo)

- show ip ospf interface brief

(No configurado en el dispositivo)

- show ip bgp summary

ISP#show ip bgp summary

BGP router identifier 209.165.200.229, local AS number 65401

BGP table version is 14, main routing table version 6

5 network entries using 660 bytes of memory

5 path entries using 260 bytes of memory

5/3 BGP path/bestpath attribute entries using 736 bytes of memory

2 BGP AS-PATH entries using 48 bytes of memory

0 BGP route-map cache entries using 0 bytes of memory

0 BGP filter-list cache entries using 0 bytes of memory

Bitfield cache entries: current 1 (at peak 1) using 32 bytes of memory

BGP using 1736 total bytes of memory

BGP activity 5/0 prefixes, 5/0 paths, scan interval 60 secs

Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd

209.165.200.225 4 65100 249 239 14 0 0 02:23:02 4

209.165.200.230 4 65101 241 239 14 0 0 02:23:02 4

- show ip bgp

```
ISP#show ip bgp
BGP table version is 14, local router ID is 209.165.200.229
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf Weight Path
*> 0.0.0.0/32       209.165.200.225          0     0     0 65100 ?
*> 1.1.1.0/29       209.165.200.225          0     0     0 65100 ?
*> 172.18.0.0/16    209.165.200.225          0     0     0 65100 ?
*  209.165.200.224/30209.165.200.225         0     0     0 65100 i
*  209.165.200.228/30209.165.200.230         0     0     0 65101 i
```

- show ip nat statistics

(No configurado en el dispositivo)

- show ip nat translations

(No configurado en el dispositivo)

- show ip dhcp binding

(No configurado en el dispositivo)

- show ip dhcp pool

(No configurado en el dispositivo)

- show ip access-lists

(No configurado en el dispositivo)

- show ntp status

```
ISP#show ntp status
Clock is synchronized, stratum 2, reference is 200.200.200.100
nominal freq is 250.0000 Hz, actual freq is 249.9990 Hz, precision is 2**24
reference time is 0C6DF4FD.000003D1 (19:9:49.977 UTC ju. jul. 11 2019)
clock offset is 0.00 msec, root delay is 0.00  msec
root dispersion is 223.68 msec, peer dispersion is -137269716642187.97 msec.
loopfilter state is 'CTRL' (Normal Controlled Loop), drift is - 0.000001193 s/s system poll interval is 4, last
update was 5 sec ago.
```

- show logging

```
ISP#show logging
Syslog logging: enabled (0 messages dropped, 0 messages rate-limited,
      0 flushes, 0 overruns, xml disabled, filtering disabled)

No Active Message Discriminator.


No Inactive Message Discriminator.


   Console logging: level debugging, 13 messages logged, xml disabled,
       filtering disabled
   Monitor logging: level debugging, 13 messages logged, xml disabled,
       filtering disabled
   Buffer logging:  disabled, xml disabled,
       filtering disabled

   Logging Exception size (4096 bytes)
   Count and timestamp logging messages: disabled
   Persistent logging: disabled
```

No active filter modules.

ESM: 0 messages dropped
Trap logging: level informational, 13 message lines logged

Router CPD

- show cdp neighbors

```
RemoteCPD#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
Switch       Gig 0/0         145          S      2960        Fas 0/5
ISP          Ser 0/0/0       169          R      C1900       Ser 0/0/0
```

- show ip interface brief

```
RemoteCPD#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     172.18.10.1     YES manual up                    up
GigabitEthernet0/1     unassigned      YES unset  administratively down down
Serial0/0/0            209.165.200.230 YES manual up                    up
Serial0/0/1            unassigned      YES unset  administratively down down
Serial0/1/0            unassigned      YES unset  administratively down down
Serial0/1/1            unassigned      YES unset  administratively down down
Tunnel0                172.17.1.2      YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
```

- show interface <type_slot_port>

```
RemoteCPD#show ip interface serial 0/0/0
Serial0/0/0 is up, line protocol is up (connected)
  Internet address is 209.165.200.230/30
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound  access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachables are always sent
  ICMP mask replies are never sent
  IP fast switching is disabled
  IP fast switching on the same interface is disabled
  IP Flow switching is disabled
  IP Fast switching turbo vector
  IP multicast fast switching is disabled
  IP multicast distributed fast switching is disabled
  Router Discovery is disabled
```

IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
WCCP Redirect outbound is disabled
WCCP Redirect exclude is disabled
BGP Policy Mapping is disabled

RemoteCPD#show ip interface tunnel 0
Tunnel0 is up, line protocol is up
Internet address is 172.17.1.2/30
Broadcast address is 255.255.255.255
Address determined by setup command
MTU is 1476 bytes
Helper address is not set
Directed broadcast forwarding is disabled
Outgoing access list is not set
Inbound access list is not set
Proxy ARP is enabled
Local Proxy ARP is disabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachables are always sent
ICMP mask replies are never sent
IP fast switching is enabled
IP fast switching on the same interface is disabled
IP Flow switching is disabled
IP CEF switching is enabled
IP CEF switching turbo vector
IP Null turbo vector
IP multicast fast switching is enabled
IP multicast distributed fast switching is disabled
IP route-cache flags are Fast, CEF
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Policy routing is disabled
Network address translation is disabled
BGP Policy Mapping is disabled
Input features: MCI Check
WCCP Redirect outbound is disabled
WCCP Redirect inbound is disabled

WCCP Redirect exclude is disabled

RemoteCPD#show ip interface gigabitEthernet 0/0
GigabitEthernet0/0 is up, line protocol is up (connected)
Internet address is 172.18.10.1/24
Broadcast address is 255.255.255.255
Address determined by setup command
MTU is 1500 bytes
Helper address is not set
Directed broadcast forwarding is disabled
Outgoing access list is not set
Inbound access list is not set
Proxy ARP is enabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachables are always sent
ICMP mask replies are never sent
IP fast switching is disabled
IP fast switching on the same interface is disabled
IP Flow switching is disabled
IP Fast switching turbo vector
IP multicast fast switching is disabled
IP multicast distributed fast switching is disabled
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
BGP Policy Mapping is disabled
Input features: MCI Check
WCCP Redirect outbound is disabled
WCCP Redirect inbound is disabled
WCCP Redirect exclude is disabled

- show versión

RemoteCPD#show version
Cisco IOS Software, C1900 Software (C1900-UNIVERSALK9-M), Version 15.1(4)M4, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 23-Feb-11 14:19 by pt_team

ROM: System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
cisco1941 uptime is 4 hours, 31 minutes, 57 seconds
System returned to ROM by power-on
System image file is "flash0:c1900-universalk9-mz.SPA.151-1.M4.bin"
Last reload type: Normal Reload

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

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http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to export@cisco.com.
Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
4 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

License Info:

License UDI:

```
-------------------------------------------------
Device#   PID               SN
-------------------------------------------------
*0       CISCO1941/K9        FTX1524S59L-


Technology Package License Information for Module:'c1900'

-----------------------------------------------------------------
Technology    Technology-package        Technology-package
              Current       Type        Next reboot
-----------------------------------------------------------------
ipbase        ipbasek9      Permanent   ipbasek9
security      disable       None        None
data          disable       None        None

Configuration register is 0x2102
```

- show startup-config

```
RemoteCPD#show startup-config
Using 2725 bytes
!
version 15.1
service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
security passwords min-length 10
!
```

```
hostname RemoteCPD
!
!
!
enable secret 5 $1$mERr$TfFTxE.mmb5O5BVC56ndL0
!
!
ip dhcp excluded-address 172.18.10.1
ip dhcp excluded-address 172.18.10.100
ip dhcp excluded-address 172.16.10.1 172.16.10.3
!
ip dhcp pool cpd
 network 172.18.10.0 255.255.255.0
 default-router 172.18.10.1
 dns-server 200.200.200.100
ip dhcp pool sales
 network 172.16.10.0 255.255.255.0
 default-router 172.16.10.2
 dns-server 200.200.200.100
!
!
!
no ip cef
no ipv6 cef
!
!
!
username ISP password 7 08315C5E2A31242717050F053A
username admin01 password 7 0820484300175546020A1F17
username adminSSH password 7 0820484300173624 3A1B0D1739
!
!
license udi pid CISCO1941/K9 sn FTX1524S59L-
!
!
!
!
!
!
!
!
!
no ip domain-lookup
ip domain-name CCNA_CS4.com
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Tunnel0
```

```
 ip address 172.17.1.2 255.255.255.252
 mtu 1476
 tunnel source Serial0/0/0
 tunnel destination 209.165.200.225
!
!
interface GigabitEthernet0/0
 description Lan Remote Network
 ip address 172.18.10.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 description Link RemoteCPD ----------> ISP
 ip address 209.165.200.230 255.255.255.252
 encapsulation ppp
 ppp authentication chap
 ip nat outside
!
interface Serial0/0/1
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial0/1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial0/1/1
 no ip address
 clock rate 2000000
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
router bgp 65101
 bgp log-neighbor-changes
 no synchronization
 neighbor 209.165.200.229 remote-as 65401
 network 209.165.200.228 mask 255.255.255.252
!
ip nat inside source list 1 pool cpd overload
ip nat inside source static 172.18.10.100 2.2.2.4
ip classless
ip route 0.0.0.0 0.0.0.0 209.165.200.229
```

```
ip route 172.16.0.0 255.255.0.0 172.17.1.1
!
ip flow-export version 9
!
!
access-list 1 permit 172.18.10.0 0.0.0.255
access-list 150 permit ip 172.18.10.0 0.0.0.255 200.200.200.0 0.0.0.255
ip access-list extended RemoteControl
 permit ip any any
 permit icmp host 172.18.10.100 172.16.10.0 0.0.0.255
 deny icmp 172.16.10.0 0.0.0.255 host 172.18.10.100 echo
 deny icmp 172.16.10.0 0.0.0.255 host 172.18.10.100 echo-reply
!
banner motd ^Chis is Remote CPD CLI.
^C
!
!
!
!
!
logging 172.18.10.100
line con 0
 login local
!
line aux 0
!
line vty 0 4
 login local
 transport input ssh
 transport output ssh
line vty 5 15
 login local
 transport input ssh
 transport output ssh
!
!
ntp server 200.200.200.100
ntp update-calendar
!
end
```

- show standby

(No configurado en el dispositivo)

- show standby brief

(No configurado en el dispositivo)

- show ip route

```
RemoteCPD#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 209.165.200.229 to network 0.0.0.0

 *   0.0.0.0/32 is subnetted, 1 subnets
B*      0.0.0.0/32 [20/0] via 209.165.200.229, 00:00:00
     1.0.0.0/29 is subnetted, 1 subnets
B       1.1.1.0/29 [20/0] via 209.165.200.229, 00:00:00
S    172.16.0.0/16 [1/0] via 172.17.1.1
     172.17.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.17.1.0/30 is directly connected, Tunnel0
L       172.17.1.2/32 is directly connected, Tunnel0
     172.18.0.0/16 is variably subnetted, 3 subnets, 3 masks
B       172.18.0.0/16 [20/0] via 209.165.200.229, 00:00:00
C       172.18.10.0/24 is directly connected, GigabitEthernet0/0
L       172.18.10.1/32 is directly connected, GigabitEthernet0/0
     209.165.200.0/24 is variably subnetted, 4 subnets, 2 masks
B       209.165.200.224/30 [20/0] via 209.165.200.229, 00:00:00
C       209.165.200.228/30 is directly connected, Serial0/0/0
C       209.165.200.229/32 is directly connected, Serial0/0/0
L       209.165.200.230/32 is directly connected, Serial0/0/0
S*   0.0.0.0/0 [1/0] via 209.165.200.229
```

- show ip protocols

```
RemoteCPD#show ip protocols
Routing Protocol is "bgp 65101"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  IGP synchronization is disabled
  Automatic route summarization is disabled
  Neighbor(s):
    Address          FiltIn FiltOut DistIn DistOut Weight RouteMap
    209.165.200.229
  Maximum path: 1
    Routing Information Sources:
      Gateway         Distance      Last Update
      209.165.200.229              20          00:00:00
    Distance: external 20 internal 200 local 200
```

- show ip ospf

(No configurado en el dispositivo)

- show ip ospf neighbors

(No configurado en el dispositivo)

- show ip ospf database

(No configurado en el dispositivo)

- show ip ospf interface <interface>

(No configurado en el dispositivo)

- show ip ospf interface brief

(No configurado en el dispositivo)

- show ip bgp summary

```
RemoteCPD#show ip bgp summary

BGP router identifier 209.165.200.230, local AS number 65101

BGP table version is 12, main routing table version 6
```

5 network entries using 660 bytes of memory

5 path entries using 260 bytes of memory

4/4 BGP path/bestpath attribute entries using 736 bytes of memory

3 BGP AS-PATH entries using 72 bytes of memory

0 BGP route-map cache entries using 0 bytes of memory

0 BGP filter-list cache entries using 0 bytes of memory

Bitfield cache entries: current 1 (at peak 1) using 32 bytes of memory

BGP using 1760 total bytes of memory

BGP activity 5/0 prefixes, 5/0 paths, scan interval 60 secs

Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd

209.165.200.229 4 65401 288 279 12 0 0 03:03:52 4

- show ip bgp

```
RemoteCPD#show ip bgp
BGP table version is 12, local router ID is 209.165.200.230
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf Weight Path
*> 0.0.0.0/32       209.165.200.229         0     0     0 65401 65100 ?
*> 1.1.1.0/29       209.165.200.229         0     0     0 65401 65100 ?
*> 172.18.0.0/16    209.165.200.229         0     0     0 65401 65100 ?
*> 209.165.200.224/30209.165.200.229        0     0     0 65401 65100 i
*> 209.165.200.228/300.0.0.0                0     0 32768 i
```

- show ip nat statistics

```
RemoteCPD#show ip nat statistics
Total translations: 1 (1 static, 0 dynamic, 0 extended)
Outside Interfaces: Serial0/0/0
Inside Interfaces:
Hits: 0  Misses: 3100
Expired translations: 0
Dynamic mappings:
-- Inside Source
access-list 1 pool cpd refCount 0
```

- show ip nat translations

```
RemoteCPD#show ip nat translations
Pro  Inside global     Inside local       Outside local      Outside global
---  2.2.2.4           172.18.10.100      ---                ---
```

- show ip dhcp binding

```
RemoteCPD#show ip dhcp binding
IP address       Client-ID/              Lease expiration        Type
                 Hardware address
```

```
172.18.10.2     0090.2112.87B0      --          Automatic
172.16.10.5     0001.43A9.AD8E      --          Automatic
172.16.10.6     000A.F3EE.0121      --          Automatic
```

- show ip dhcp pool

```
RemoteCPD#show ip dhcp pool

Pool cpd :
 Utilization mark (high/low)    : 100 / 0
 Subnet size (first/next)       : 0 / 0
 Total addresses                : 254
 Leased addresses               : 1
 Excluded addresses             : 3
 Pending event                  : none

 1 subnet is currently in the pool
 Current index       IP address range                  Leased/Excluded/Total
 172.18.10.1         172.18.10.1     - 172.18.10.254     1    / 3     / 254

Pool sales :
 Utilization mark (high/low)    : 100 / 0
 Subnet size (first/next)       : 0 / 0
 Total addresses                : 254
 Leased addresses               : 2
 Excluded addresses             : 3
 Pending event                  : none

 1 subnet is currently in the pool
 Current index       IP address range                  Leased/Excluded/Total
 172.16.10.1         172.16.10.1     - 172.16.10.254     2    / 3     / 254
```

- show ip access-lists

```
RemoteCPD#show ip access-lists
Standard IP access list 1
   10 permit 172.18.10.0 0.0.0.255
Extended IP access list 150
   10 permit ip 172.18.10.0 0.0.0.255 200.200.200.0 0.0.0.255
Extended IP access list RemoteControl
   10 permit ip any any
   20 permit icmp host 172.18.10.100 172.16.10.0 0.0.0.255
   30 deny icmp 172.16.10.0 0.0.0.255 host 172.18.10.100 echo
   40 deny icmp 172.16.10.0 0.0.0.255 host 172.18.10.100 echo-reply
```

- show ntp status

```
RemoteCPD#show ntp status
Clock is synchronized, stratum 2, reference is 200.200.200.100
nominal freq is 250.0000 Hz, actual freq is 249.9990 Hz, precision is 2**24
reference time is 0C6DF4E9.00000189 (19:9:29.393 UTC ju. jul. 11 2019)
clock offset is 0.00 msec, root delay is 1.00  msec
root dispersion is 260.59 msec, peer dispersion is -137269716642169.50 msec.
loopfilter state is 'CTRL' (Normal Controlled Loop), drift is - 0.000001193 s/s system poll interval is 4, last
update was 7 sec ago.
```

- show logging

```
RemoteCPD#show logging
Syslog logging: enabled (0 messages dropped, 0 messages rate-limited,
        0 flushes, 0 overruns, xml disabled, filtering disabled)

No Active Message Discriminator.


No Inactive Message Discriminator.


    Console logging: level debugging, 11 messages logged, xml disabled,
        filtering disabled
    Monitor logging: level debugging, 11 messages logged, xml disabled,
        filtering disabled
    Buffer logging:  disabled, xml disabled,
        filtering disabled

    Logging Exception size (4096 bytes)
    Count and timestamp logging messages: disabled
    Persistent logging: disabled

No active filter modules.

ESM: 0 messages dropped
    Trap logging: level informational, 11 message lines logged
        Logging to 172.18.10.100  (udp port 514,  audit disabled,
            authentication disabled, encryption disabled, link up),
            11 message lines logged,
            0 message lines rate-limited,
            0 message lines dropped-by-MD,
            xml disabled, sequence number disabled
            filtering disabled
```

Switch's

Se procede a realizar las configuraciones necesarias en los switch's según las necesidades acordadas, se habilitan controles de acceso a todos los dispositivos, a continuación, el resultado de cada configuración, protocolo:

Switch 1

- show cdp neighbors

```
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         167          R      C1900       Gig 0/0
R1           Fas 0/5         167          R      C1900       Gig 0/0.10
R1           Fas 0/5         167          R      C1900       Gig 0/0.20
R1           Fas 0/5         167          R      C1900       Gig 0/0.99
SW3           Por 1           162          S      2960        Fas 0/2
SW2           Por 2           162          S      2960        Fas 0/3
SW2           Por 2           162          S      2960        Fas 0/4
SW2           Por 2           162          S      2960        Por 2
SW3           Por 1           162          S      2960        Fas 0/1
```

SW3 Por 1 162 S 2960 Por 1

- show ip interface brief

SW1#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	up	up
FastEthernet0/6	unassigned	YES	manual	up	up
Vlan99	172.16.99.11	YES	manual	up	up

- show versión

SW1#show version
Cisco IOS Software, C2960 Software (C2960-LANBASE-M), Version 12.2(25)FX, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 12-Oct-05 22:05 by pt_team

ROM: C2960 Boot Loader (C2960-HBOOT-M) Version 12.2(25r)FX, RELEASE SOFTWARE (fc4)

System returned to ROM by power-on

Cisco WS-C2960-24TT (RC32300) processor (revision C0) with 21039K bytes of memory.

24 FastEthernet/IEEE 802.3 interface(s)
2 Gigabit Ethernet/IEEE 802.3 interface(s)

63488K bytes of flash-simulated non-volatile configuration memory.
Base ethernet MAC Address : 000A.F378.C865
Motherboard assembly number : 73-9832-06
Power supply part number : 341-0097-02
Motherboard serial number : FOC103248MJ
Power supply serial number : DCA102133JA
Model revision number : B0
Motherboard revision number : C0
Model number : WS-C2960-24TT
System serial number : FOC1033Z1EY
Top Assembly Part Number : 800-26671-02
Top Assembly Revision Number : B0
Version ID : V02
CLEI Code Number : COM3K00BRA
Hardware Board Revision Number : 0x01

Switch	Ports	Model	SW Version	SW Image
* 1	26	WS-C2960-24TT	12.2	C2960-LANBASE-M

Configuration register is 0xF

- show startup-config

SW1#show startup-config
Using 3117 bytes

```
!
version 12.2
service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname SW1
!
enable secret 5 $1$mERr$TfFTxE.mmb5O5BVC56ndL0
!
!
!
no ip domain-lookup
!
username remote privilege 1 password 7 0822455D0A1613030B1B0D517F
!
!
spanning-tree mode rapid-pvst
spanning-tree extend system-id
spanning-tree vlan 20,99 priority 24576
spanning-tree vlan 10 priority 28672
!
interface Port-channel1
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
!
interface Port-channel2
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
!
interface FastEthernet0/1
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
 channel-group 1 mode on
!
interface FastEthernet0/2
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
 channel-group 1 mode on
!
interface FastEthernet0/3
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
 channel-group 2 mode desirable
!
interface FastEthernet0/4
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
```

```
 channel-group 2 mode desirable
!
interface FastEthernet0/5
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
!
interface FastEthernet0/6
 switchport access vlan 10
 switchport mode access
 spanning-tree portfast
 spanning-tree bpduguard enable
!
interface FastEthernet0/7
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/8
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/11
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/12
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/13
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/14
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/17
```

```
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan99
 mac-address 000a.f378.c801
 ip address 172.16.99.11 255.255.255.0
!
ip default-gateway 172.16.99.2
!
banner motd ^Chis is SW1 CLI.
^C
logging 172.18.10.100
!
!
!
line con 0
 login local
!
line vty 0 4
 login local
 transport input telnet
 transport output telnet
line vty 5 15
 login local
 transport input telnet
 transport output telnet
!
!
!
ntp server 200.200.200.100
!
end
```

- show interfaces trunk

```
SW1#show interfaces trunk
Port        Mode         Encapsulation  Status       Native vlan
Po1         on           802.1q         trunking     99
Po2         on           802.1q         trunking     99
Fa0/5       on           802.1q         trunking     99

Port        Vlans allowed on trunk
Po1         10,20,99
Po2         10,20,99
Fa0/5       10,20,99

Port        Vlans allowed and active in management domain
Po1         10,20,99
Po2         10,20,99
Fa0/5       10,20,99

Port        Vlans in spanning tree forwarding state and not pruned
Po1         10,20,99
Po2         10,20,99
Fa0/5       10,20,99
```

- show interface vlan <management vlan>

```
SW1#show interfaces vlan 99
Vlan99 is up, line protocol is up
  Hardware is CPU Interface, address is 000a.f378.c801 (bia 000a.f378.c801)
  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 runts, 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
```

- show vlan brief

```
SW1#show vlan brief

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

```
                                Gig0/2
10   Sales                    active    Fa0/6, Fa0/7, Fa0/8, Fa0/9
                                Fa0/10, Fa0/11
20   Servers                  active    Fa0/12, Fa0/13, Fa0/14, Fa0/15
                                Fa0/16, Fa0/17
99   Management                  active
1002 fddi-default             active
1003 token-ring-default           active
1004 fddinet-default          active
1005 trnet-default            active
```

- show vtp status

```
SW1#show vtp status
VTP Version                 : 2
Configuration Revision      : 6
Maximum VLANs supported locally : 255
Number of existing VLANs    : 8
VTP Operating Mode          : Server
VTP Domain Name             : CSCCNA4
VTP Pruning Mode            : Disabled
VTP V2 Mode                 : Disabled
VTP Traps Generation        : Disabled
MD5 digest                  : 0x65 0x5F 0x5F 0x93 0x4C 0xE4 0x6C 0xB1
Configuration last modified by 0.0.0.0 at 3-1-93 00:58:58
Local updater ID is 172.16.99.11 on interface Vl99 (lowest numbered VLAN interface found)
SW1#
```

- show spanning-tree

```
SW1#show spanning-tree
VLAN0010
 Spanning tree enabled protocol rstp
 Root ID    Priority    28682
        Address     0009.7C18.4B5E
        Cost        9
        Port        27(Port-channel1)
        Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

 Bridge ID  Priority    28682  (priority 28672 sys-id-ext 10)
        Address     000A.F378.C865
        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
Fa0/6            Desg FWD 19        128.6    P2p
Po1              Root FWD 9         128.27   Shr
Po2              Desg FWD 9         128.28   Shr

VLAN0020
 Spanning tree enabled protocol rstp
 Root ID    Priority    24596
```

```
        Address     000A.F378.C865
        This bridge is the root
        Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    24596  (priority 24576 sys-id-ext 20)
        Address     000A.F378.C865
        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
Po1             Desg FWD 9         128.27   Shr
Po2             Desg FWD 9         128.28   Shr

VLAN0099
  Spanning tree enabled protocol rstp
  Root ID    Priority    24675
        Address     000A.F378.C865
        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     000A.F378.C865
        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
Po1             Desg FWD 9         128.27   Shr
Po2             Desg FWD 9         128.28   Shr
```

- show port-security

(No configurado en el dispositivo)

- show port-security interface <secured port>

(No configurado en el dispositivo)

- show etherchannel

```
SW1#show etherchannel
          Channel-group listing:
          ----------------------

Group: 1
----------
Group state = L2
Ports: 2 Maxports = 8
Port-channels: 1 Max Port-channels = 1
Protocol:    -
```

Group: 2

Group state = L2
Ports: 2 Maxports = 8
Port-channels: 1 Max Port-channels = 1
Protocol: -

- show etherchannel summary

SW1#show etherchannel summary
Flags: D - down P - in port-channel
I - stand-alone s - suspended
H - Hot-standby (LACP only)
R - Layer3 S - Layer2
U - in use f - failed to allocate aggregator
u - unsuitable for bundling
w - waiting to be aggregated
d - default port

Number of channel-groups in use: 2
Number of aggregators: 2

Group Port-channel Protocol Ports
------+-------------+-----------+---

1 Po1(SU) - Fa0/1(P) Fa0/2(P)
2 Po2(SU) PAgP Fa0/3(P) Fa0/4(P)

- show logging

SW1#show logging
Syslog logging: enabled (0 messages dropped, 0 messages rate-limited,
0 flushes, 0 overruns, xml disabled, filtering disabled)

No Active Message Discriminator.

No Inactive Message Discriminator.

Console logging: level debugging, 25 messages logged, xml disabled,
filtering disabled
Monitor logging: level debugging, 25 messages logged, xml disabled,
filtering disabled
Buffer logging: disabled, xml disabled,
filtering disabled

Logging Exception size (4096 bytes)
Count and timestamp logging messages: disabled
Persistent logging: disabled

No active filter modules.

ESM: 0 messages dropped
Trap logging: level informational, 25 message lines logged

Logging to 172.18.10.100 (udp port 514, audit disabled,
authentication disabled, encryption disabled, link up),
25 message lines logged,
0 message lines rate-limited,
0 message lines dropped-by-MD,
xml disabled, sequence number disabled
filtering disabled

Switch 2

- show cdp neighbors

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
SW1	Por 2	174	S	2960	Fas 0/4
SW1	Por 2	174	S	2960	Por 2
SW1	Por 2	174	S	2960	Fas 0/3
SW3	Por 3	143	S	2960	Fas 0/3
SW3	Por 3	143	S	2960	Fas 0/4
SW3	Por 3	143	S	2960	Por 3

- show ip interface brief

SW2#show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
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
FastEthernet0/12	unassigned	YES	manual	up	up
Vlan99	172.16.99.12	YES	manual	up	up

- show versión

SW2#show version
Cisco IOS Software, C2960 Software (C2960-LANBASE-M), Version 12.2(25)FX, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 12-Oct-05 22:05 by pt_team

ROM: C2960 Boot Loader (C2960-HBOOT-M) Version 12.2(25r)FX, RELEASE SOFTWARE (fc4)

System returned to ROM by power-on

Cisco WS-C2960-24TT (RC32300) processor (revision C0) with 21039K bytes of memory.

24 FastEthernet/IEEE 802.3 interface(s)
2 Gigabit Ethernet/IEEE 802.3 interface(s)

63488K bytes of flash-simulated non-volatile configuration memory.
Base ethernet MAC Address : 0060.2F86.72B3
Motherboard assembly number : 73-9832-06
Power supply part number : 341-0097-02
Motherboard serial number : FOC103248MJ
Power supply serial number : DCA102133JA

```
Model revision number          : B0
Motherboard revision number    : C0
Model number                   : WS-C2960-24TT
System serial number           : FOC1033Z1EY
Top Assembly Part Number       : 800-26671-02
Top Assembly Revision Number   : B0
Version ID                     : V02
CLEI Code Number               : COM3K00BRA
Hardware Board Revision Number : 0x01


Switch   Ports  Model           SW Version           SW Image
------   -----  -----           ----------           ----------
*    1   26     WS-C2960-24TT   12.2                 C2960-LANBASE-M

Configuration register is 0xF
```

- show startup-config

```
SW2#show startup-config
Using 3240 bytes
!
version 12.2
service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname SW2
!
enable secret 5 $1$mERr$TfFTxE.mmb5O5BVC56ndL0
!
!
!
no ip domain-lookup
!
username remote privilege 1 password 7 0822455D0A1613030B1B0D517F
!
!
spanning-tree mode rapid-pvst
spanning-tree extend system-id
!
interface Port-channel2
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
!
interface Port-channel3
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
!
interface FastEthernet0/1
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
 channel-group 3 mode passive
```

```
!
interface FastEthernet0/2
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
 channel-group 3 mode passive
!
interface FastEthernet0/3
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
 channel-group 2 mode auto
!
interface FastEthernet0/4
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
 channel-group 2 mode auto
!
interface FastEthernet0/5
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
!
interface FastEthernet0/6
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/8
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/11
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/12
 switchport access vlan 20
 switchport mode access
 switchport port-security
 switchport port-security maximum 3
 switchport port-security violation restrict
```

```
 switchport port-security mac-address 000A.4128.3497
 spanning-tree portfast
 spanning-tree bpduguard enable
!
interface FastEthernet0/13
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/14
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/17
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan99
 mac-address 0060.2f86.7201
 ip address 172.16.99.12 255.255.255.0
!
ip default-gateway 172.16.99.2
!
banner motd ^Chis is SW2 CLI.
^C
```

```
logging 172.18.10.100
!
!
!
line con 0
 password 7 0822455D0A1606181C1B0D517F
 login local
!
line vty 0 4
 login local
 transport input telnet
 transport output telnet
line vty 5 15
 login local
 transport input telnet
 transport output telnet
!
!
!
ntp server 200.200.200.100
!
end
```

- show interfaces trunk

```
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         10,20,99
Po3         10,20,99

Port        Vlans allowed and active in management domain
Po2         10,20,99
Po3         10,20,99

Port        Vlans in spanning tree forwarding state and not pruned
Po2         20,99
Po3         10
```

- show interface vlan <management vlan>

```
SW2# show interfaces vlan 99
Vlan99 is up, line protocol is up
  Hardware is CPU Interface, address is 0060.2f86.7201 (bia 0060.2f86.7201)
  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 runts, 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
```

- show vlan brief

```
SW2#show vlan brief

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

- show vtp status

```
SW2#show vtp status
VTP Version                     : 2
Configuration Revision          : 6
Maximum VLANs supported locally : 255
Number of existing VLANs        : 8
VTP Operating Mode              : Client
VTP Domain Name                 : CSCCNA4
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x65 0x5F 0x5F 0x93 0x4C 0xE4 0x6C 0xB1
Configuration last modified by 0.0.0.0 at 3-1-93 00:58:58
```

- show spanning-tree

```
SW2#show spanning-tree
VLAN0010
  Spanning tree enabled protocol rstp
  Root ID    Priority    28682
             Address     0009.7C18.4B5E
             Cost        9
             Port        28(Port-channel3)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32778  (priority 32768 sys-id-ext 10)
```

```
        Address     0060.2F86.72B3
        Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
        Aging Time  20

Interface       Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po3             Root FWD 9         128.28   Shr
Po2             Altn BLK 9         128.27   Shr

VLAN0020
 Spanning tree enabled protocol rstp
 Root ID    Priority    24596
        Address     000A.F378.C865
        Cost        9
        Port        27(Port-channel2)
        Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

 Bridge ID  Priority    32788  (priority 32768 sys-id-ext 20)
        Address     0060.2F86.72B3
        Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
        Aging Time  20

Interface       Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/12          Desg FWD 19        128.12   P2p
Po3             Altn BLK 9         128.28   Shr
Po2             Root FWD 9         128.27   Shr

VLAN0099
 Spanning tree enabled protocol rstp
 Root ID    Priority    24675
        Address     000A.F378.C865
        Cost        9
        Port        27(Port-channel2)
        Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

 Bridge ID  Priority    32867  (priority 32768 sys-id-ext 99)
        Address     0060.2F86.72B3
        Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
        Aging Time  20

Interface       Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po3             Altn BLK 9         128.28   Shr
Po2             Root FWD 9         128.27   Shr
```

- show port-security

```
SW2#show port-security
```

```
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
           (Count)      (Count)       (Count)
---------------------------------------------------------------------
     Fa0/12       3         1              0        Restrict
---------------------------------------------------------------------
```

- show port-security interface <secured port>

```
SW2#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
           (Count)      (Count)       (Count)
---------------------------------------------------------------------
     Fa0/12       3         1              0        Restrict
---------------------------------------------------------------------
SW2#sh
SW2#show po
SW2#show port-security in
SW2#show port-security interface f0/12
Port Security            : Enabled
Port Status              : Secure-up
Violation Mode           : Restrict
Aging Time               : 0 mins
Aging Type               : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses     : 3
Total MAC Addresses       : 1
Configured MAC Addresses   : 1
Sticky MAC Addresses      : 0
Last Source Address:Vlan   : 000A.4128.3497:20
Security Violation Count   : 0
```

- show etherchannel

```
SW2#show etherchannel
            Channel-group listing:
            ----------------------


Group: 2
----------
Group state = L2
Ports: 2 Maxports = 16
Port-channels: 1 Max Port-channels = 16
Protocol:   LACP

Group: 3
----------
Group state = L2
Ports: 2 Maxports = 16
Port-channels: 1 Max Port-channels = 16
Protocol:   LACP
```

- show etherchannel summary

```
SW2#show etherchannel summary
Flags:  D - down        P - in port-channel
       I - stand-alone s - suspended
       H - Hot-standby (LACP only)
```

R - Layer3 S - Layer2
U - in use f - failed to allocate aggregator
u - unsuitable for bundling
w - waiting to be aggregated
d - default port

Number of channel-groups in use: 2
Number of aggregators: 2

Group Port-channel Protocol Ports
------+-------------+-----------+---

2 Po2(SU) PAgP Fa0/3(P) Fa0/4(P)
3 Po3(SU) LACP Fa0/1(P) Fa0/2(P)

- show logging

SW2#show logging
Syslog logging: enabled (0 messages dropped, 0 messages rate-limited,
0 flushes, 0 overruns, xml disabled, filtering disabled)

No Active Message Discriminator.

No Inactive Message Discriminator.

Console logging: level debugging, 20 messages logged, xml disabled,
filtering disabled
Monitor logging: level debugging, 20 messages logged, xml disabled,
filtering disabled
Buffer logging: disabled, xml disabled,
filtering disabled

Logging Exception size (4096 bytes)
Count and timestamp logging messages: disabled
Persistent logging: disabled

No active filter modules.

ESM: 0 messages dropped
Trap logging: level informational, 20 message lines logged
Logging to 172.18.10.100 (udp port 514, audit disabled,
authentication disabled, encryption disabled, link up),
20 message lines logged,
0 message lines rate-limited,
0 message lines dropped-by-MD,
xml disabled, sequence number disabled
filtering disabled

Switch 3

- show cdp neighbors

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	130	S	2960	Fas 0/1
SW1	Por 1	130	S	2960	Fas 0/2
SW1	Por 1	130	S	2960	Por 1
R3	Fas 0/5	164	R	C1900	Gig 0/0
R3	Fas 0/5	164	R	C1900	Gig 0/0.10
R3	Fas 0/5	164	R	C1900	Gig 0/0.20
R3	Fas 0/5	164	R	C1900	Gig 0/0.99
SW2	Por 3	159	S	2960	Fas 0/1
SW2	Por 3	159	S	2960	Fas 0/2
SW2	Por 3	159	S	2960	Por 3

- show ip interface brief

SW3#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
FastEthernet0/6	unassigned	YES	manual	up	up
Vlan99	172.16.99.13	YES	manual	up	up

- show versión

SW3# show version
Cisco IOS Software, C2960 Software (C2960-LANBASE-M), Version 12.2(25)FX, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 12-Oct-05 22:05 by pt_team

ROM: C2960 Boot Loader (C2960-HBOOT-M) Version 12.2(25r)FX, RELEASE SOFTWARE (fc4)

System returned to ROM by power-on

Cisco WS-C2960-24TT (RC32300) processor (revision C0) with 21039K bytes of memory.

24 FastEthernet/IEEE 802.3 interface(s)
2 Gigabit Ethernet/IEEE 802.3 interface(s)

63488K bytes of flash-simulated non-volatile configuration memory.
Base ethernet MAC Address : 0009.7C18.4B5E
Motherboard assembly number : 73-9832-06
Power supply part number : 341-0097-02
Motherboard serial number : FOC103248MJ
Power supply serial number : DCA102133JA
Model revision number : B0
Motherboard revision number : C0
Model number : WS-C2960-24TT
System serial number : FOC1033Z1EY
Top Assembly Part Number : 800-26671-02
Top Assembly Revision Number : B0
Version ID : V02
CLEI Code Number : COM3K00BRA
Hardware Board Revision Number : 0x01

```
Switch   Ports  Model           SW Version           SW Image
------   -----  -----           ----------           ----------
*    1   26     WS-C2960-24TT     12.2                 C2960-LANBASE-M

Configuration register is 0xF
```

- show startup-config

```
SW3#show running-config
Building configuration...

Current configuration : 3139 bytes
!
version 12.2
service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname SW3
!
enable secret 5 $1$mERr$TfFTxE.mmb5O5BVC56ndL0
!
!
!
!
username remote privilege 1 password 7 0822455D0A1613030B1B0D517F
!
vtp domain CSCCNA4
vtp mode transparent
vtp password VTPccna4pass
!
!
spanning-tree mode rapid-pvst
spanning-tree extend system-id
spanning-tree vlan 10,20,99 priority 28672
!
vlan 10
 name Sales
!
vlan 20
 name Servers
!
vlan 99
 name Management
!
interface Port-channel1
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
!
interface Port-channel3
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
!
```

```
interface FastEthernet0/1
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
 channel-group 1 mode on
!
interface FastEthernet0/2
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
 channel-group 1 mode on
!
interface FastEthernet0/3
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
 channel-group 3 mode active
!
interface FastEthernet0/4
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
 channel-group 3 mode active
!
interface FastEthernet0/5
 switchport trunk native vlan 99
 switchport trunk allowed vlan 10,20,99
 switchport mode trunk
!
interface FastEthernet0/6
 switchport access vlan 10
 switchport mode access
 spanning-tree portfast
 spanning-tree bpduguard enable
!
interface FastEthernet0/7
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/8
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/11
 switchport access vlan 10
 switchport mode access
```

```
!
interface FastEthernet0/12
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/13
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/14
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/17
 switchport access vlan 20
 switchport mode access
interface Vlan1
 no ip address
 shutdown
!
interface Vlan99
 mac-address 0009.7c18.4b01
 ip address 172.16.99.13 255.255.255.0
!
ip default-gateway 172.16.99.2
!
banner motd ^Chis in SW3 CLI.
^C
logging 172.18.10.100
!
line con 0
 password 7 0822455D0A1606181C1B0D517F
 login local
!
line vty 0 4
 login local
line vty 5 15
 login local
!
!
!
ntp server 200.200.200.100
!
end
```

- show interfaces trunk

```
SW3#show interfaces trunk
```

```
Port      Mode       Encapsulation  Status       Native vlan
Po1       on         802.1q         trunking     99
Po3       on         802.1q         trunking     99
Fa0/5     on         802.1q         trunking     99

Port      Vlans allowed on trunk
Po1       10,20,99
Po3       10,20,99
Fa0/5     10,20,99

Port      Vlans allowed and active in management domain
Po1       10,20,99
Po3       10,20,99
Fa0/5     10,20,99

Port      Vlans in spanning tree forwarding state and not pruned
Po1       10,20,99
Po3       10,20,99
Fa0/5     10,20,99
```

- show interface vlan <management vlan>

```
SW3#show interfaces vlan 99
Vlan99 is up, line protocol is up
  Hardware is CPU Interface, address is 0009.7c18.4b01 (bia 0009.7c18.4b01)
  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 runts, 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
```

- show vlan brief

```
SW3#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/18, Fa0/19, Fa0/20, Fa0/21
                                                Fa0/22, Fa0/23, Fa0/24, Gig0/1
                                                Gig0/2
10   Sales                            active    Fa0/6, Fa0/7, Fa0/8, Fa0/9
```

```
                                Fa0/10, Fa0/11
20   Servers                    active    Fa0/12, Fa0/13, Fa0/14, Fa0/15
                                Fa0/16, Fa0/17
99   Management                 active
1002 fddi-default               active
1003 token-ring-default         active
1004 fddinet-default            active
1005 trnet-default              active
```

- show vtp status

```
SW3#show vtp status
VTP Version                     : 2
Configuration Revision          : 0
Maximum VLANs supported locally : 255
Number of existing VLANs        : 8
VTP Operating Mode              : Transparent
VTP Domain Name                 : CSCCNA4
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0xC8 0xBC 0xC6 0x9E 0x6C 0xC4 0xAF 0xC0
Configuration last modified by 0.0.0.0 at 3-1-93 01:10:42
```

- show spanning-tree

```
SW3#show spanning-tree
VLAN0010
  Spanning tree enabled protocol rstp
  Root ID    Priority    28682
             Address     0009.7C18.4B5E
             This bridge is the root
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    28682  (priority 28672 sys-id-ext 10)
             Address     0009.7C18.4B5E
             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
Fa0/6            Desg FWD 19        128.6    P2p
Po1              Desg FWD 9         128.27   Shr
Po3              Desg FWD 9         128.28   Shr

VLAN0020
  Spanning tree enabled protocol rstp
  Root ID    Priority    24596
             Address     000A.F378.C865
             Cost        9
             Port        27(Port-channel1)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
```

```
 Bridge ID  Priority    28692  (priority 28672 sys-id-ext 20)
          Address     0009.7C18.4B5E
          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
Po1             Root FWD 9         128.27   Shr
Po3             Desg FWD 9         128.28   Shr

VLAN0099
 Spanning tree enabled protocol rstp
 Root ID    Priority    24675
          Address     000A.F378.C865
          Cost        9
          Port        27(Port-channel1)
          Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

 Bridge ID  Priority    28771  (priority 28672 sys-id-ext 99)
          Address     0009.7C18.4B5E
          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
Po1             Root FWD 9         128.27   Shr
Po3             Desg FWD 9         128.28   Shr
```

- show port-security

(No configurado en el dispositivo)

- show port-security interface <secured port>

(No configurado en el dispositivo)

- show etherchannel

```
SW3#show etherchannel
          Channel-group listing:
          ----------------------

Group: 1
----------
Group state = L2
Ports: 2 Maxports = 8
Port-channels: 1 Max Port-channels = 1
Protocol:   -

Group: 3
----------
```

Group state = L2

Ports: 2 Maxports = 16

Port-channels: 1 Max Port-channels = 16

Protocol: LACP

- show etherchannel summary

SW3#show etherchannel summary
Flags: D - down P - in port-channel
I - stand-alone s - suspended
H - Hot-standby (LACP only)
R - Layer3 S - Layer2
U - in use f - failed to allocate aggregator
u - unsuitable for bundling
w - waiting to be aggregated
d - default port

Number of channel-groups in use: 2
Number of aggregators: 2

Group Port-channel Protocol Ports
------+-------------+-----------+---

1 Po1(SU) - Fa0/1(P) Fa0/2(P)
3 Po3(SU) LACP Fa0/3(P) Fa0/4(P)

- show logging

SW3#show logging
Syslog logging: enabled (0 messages dropped, 0 messages rate-limited,
0 flushes, 0 overruns, xml disabled, filtering disabled)

No Active Message Discriminator.

No Inactive Message Discriminator.

Console logging: level debugging, 21 messages logged, xml disabled,
filtering disabled
Monitor logging: level debugging, 21 messages logged, xml disabled,
filtering disabled
Buffer logging: disabled, xml disabled,
filtering disabled

Logging Exception size (4096 bytes)
Count and timestamp logging messages: disabled
Persistent logging: disabled

No active filter modules.

ESM: 0 messages dropped
Trap logging: level informational, 21 message lines logged
Logging to 172.18.10.100 (udp port 514, audit disabled,
authentication disabled, encryption disabled, link up),
21 message lines logged,

0 message lines rate-limited,
0 message lines dropped-by-MD,
xml disabled, sequence number disabled
filtering disabled

Test de conectividad

PDU List Window

Fire	Last Status	Source	Destination	Type	Color
	Successful	PC1	R1	ICMP	
	Successful	PC1	R3	ICMP	
	Successful	PC1	PC2	ICMP	
	Successful	PC1	SW1	ICMP	
	Successful	PC1	SW2	ICMP	
	Successful	PC1	SW3	ICMP	
	Successful	PC1	Internal Server	ICMP	
	Successful	Internal Server	R1	ICMP	
	Successful	Internal Server	R3	ICMP	
	Successful	SW1	R1	ICMP	
	Successful	SW2	R3	ICMP	
	Successful	SW1	SW2	ICMP	
	Successful	SW1	SW3	ICMP	
	Successful	SW2	SW3	ICMP	
	Successful	SW3	SW1	ICMP	
	Successful	R1	R3	ICMP	
	Successful	R1	R2	ICMP	
	Successful	R2	R3	ICMP	
	Successful	R2	ISP	ICMP	
	Successful	ISP	RemoteCPD	ICMP	
	Successful	PC3	RemoteCPD	ICMP	
	Successful	Remote Server (Syslog)	RemoteCPD	ICMP	
	Successful	ExternNTP,Web,FTP	ISP	ICMP	

Configuraciones de DHCP

El DNS que repartirá dhcp será: 200.200.200.100.

Verificación de DHCP

a. Note the IP address of PC1: 172.16.10.5
b. Note the IP address of PC2: 172.16.10.6
c. Note the IP address of PC3: 172.18.10.2
d. El pc3 pertenece a un pool distinto que los otros pc.
e. Conectividad entre los dispositivos.

```
RemoteCPD#show ip dhcp binding
IP address       Client-ID/              Lease expiration        Type
                 Hardware address
172.18.10.2      0090.2112.87B0           --                     Automatic
172.16.10.5      0001.43A9.AD8E           --                     Automatic
172.16.10.6      000A.F3EE.0121           --                     Automatic
```

- los dispositivos envían logs al servidor indicado porque se indicó su ip en la

configuración.

Aplicación de ACL's

Router 1

access-list 101 permit ip any any
access-list 101 deny tcp 172.16.20.0 0.0.0.255 host 172.16.10.1 eq 22
access-list 101 deny tcp 172.16.99.0 0.0.0.255 host 172.16.10.1 eq 22
access-list 101 deny tcp 172.16.99.0 0.0.0.255 host 172.16.10.1 eq telnet
access-list 101 deny tcp 172.16.20.0 0.0.0.255 host 172.16.10.1 eq telnet

Router 2

Standard IP access list 1

10 permit 172.16.10.0 0.0.0.255

Extended IP access list 100

10 permit ip 172.16.10.0 0.0.0.255 200.200.200.0 0.0.0.255

Extended IP access list web

10 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq www

20 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq 443

30 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq www

40 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq 443

50 permit ip any any

Extended IP access list 150

10 deny tcp 172.16.10.0 0.0.0.255 host 200.200.200.100 eq 20

20 deny tcp 172.16.10.0 0.0.0.255 host 200.200.200.100 eq ftp

30 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq 20

40 deny tcp 172.16.20.0 0.0.0.255 host 200.200.200.100 eq ftp

50 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq ftp

60 deny tcp 172.16.99.0 0.0.0.255 host 200.200.200.100 eq 20

70 permit ip any any (8854 match(es))

CPDRemote

Standard IP access list 1
10 permit 172.18.10.0 0.0.0.255
Extended IP access list 150
10 permit ip 172.18.10.0 0.0.0.255 200.200.200.0 0.0.0.255
Extended IP access list RemoteControl
10 permit ip any any
20 permit icmp host 172.18.10.100 172.16.10.0 0.0.0.255
30 deny icmp 172.16.10.0 0.0.0.255 host 172.18.10.100 echo
40 deny icmp 172.16.10.0 0.0.0.255 host 172.18.10.100 echo-reply