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<u>Project 10 : Advanced OSPF-Based Multi-Site</u> <u>Enterprise Network</u>

Network Overview

The enterprise network consists of four sites:

Headquarters (HQ), Branch A, Branch B and Remote Office. The network will be interconnected using OSPF with multiple areas, leveraging advanced OSPF features like summarization. Additional configurations include VLANs, inter-VLAN routing, EtherChannel, ACLs, NAT.

- Network Topology
- 1. *Headquarters (HQ): -

*Devices: 2 Routers, 3 Layer 3 Switches -

*VLANs: - VLAN 10 (Management) - VLAN 20 (Sales) - VLAN 30 (IT) - VLAN 40 (Finance) - VLAN 50 (Guest)

Inter-VLAN Routing: Using Layer 3 Switches

EtherChannel: Configured between Layer 3 Switches and routers for redundancy

OSPF (area0) Features: Route summarization, passive interfaces and changing reference Bandwidth.

• 2. Branch A: -

Devices: 1 Router, 2 Layer 2 Switches

-One network With Dynamic ARP Inspection configuration. -

NAT: PAT for internet access

• 3. Branch B: -

Devices: 1 Router, 1 Layer 2 Switch

- VLANs: - VLAN 120 (Engineering) - VLAN 130 (HR)

- Inter-VLAN Routing: Router-on-a-Stick

- NAT: Static NAT for specific hosts needing external access

• 4. Remote Office:

- Devices: 1 Router, 1 Layer 2 Switch

- OSPF Area: Area 2

- AAA for secure device management.
- VLANs: VLAN 140 (Remote Users) VLAN 150 (Remote IT)
- port security is required (use variety of port security options)

Headquarters (HQ): -

Configuration

172.16.40.1

1-Multilayer SW

Building configuration	dns-server 8.8.8.8	interface
	ip dhcp pool Guest.net	GigabitEthernet1/0/3
Current configuration :	network 172.16.50.0	switchport mode trunk
4975 bytes	255.255.255.0	channel-protocol lacp
!	default-router	channel-group 1 mode
version 16.3.2	172.16.50.1	active
no service timestamps	dns-server 8.8.8.8	!
log datetime msec	!	interface
no service timestamps	no ip cef	GigabitEthernet1/0/4
debug datetime msec	ip routing	switchport mode trunk
no service password-	!	channel-protocol lacp
encryption	no ipv6 cef	channel-group 1 mode
1	!	active
hostname HQ-DSW	ip arp inspection vlan	!
!	1,10,20,40,50	interface
ip dhcp excluded-address	!	GigabitEthernet1/0/5
172.16.10.0 172.16.10.50	ip dhcp snooping vlan	switchport mode trunk
ip dhcp excluded-address	1,10,20,30,40,50	channel-protocol lacp
172.16.20.0 172.16.20.50	no ip dhcp snooping	channel-group 2 mode
ip dhcp excluded-address	information option	active
172.16.30.0 172.16.30.50	ip dhcp snooping	!
ip dhcp excluded-address		interface
172.16.40.0 172.16.40.50	!	GigabitEthernet1/0/6
ip dhcp excluded-address	!	switchport mode trunk
172.16.50.0 172.16.50.50	spanning-tree mode pvst	channel-protocol lacp
!		channel-group 2 mode
ip dhcp pool	interface Port-channel1	active
Management.net	switchport mode trunk	!
network 172.16.10.0		interface
255.255.255.0	interface Port-channel2	GigabitEthernet1/0/7
default-router	switchport mode trunk	!
172.16.10.1	!	interface
dns-server 8.8.8.8	interface	GigabitEthernet1/0/8
ip dhcp pool Sales.net	GigabitEthernet1/0/1	!
network 172.16.20.0	no switchport	interface
255.255.255.0	ip address 192.168.1.3	GigabitEthernet1/0/9
default-router	255.255.255.0	!
172.16.20.1	ip ospf priority 0	interface
dns-server 8.8.8.8	duplex auto	GigabitEthernet1/0/10
ip dhcp pool IT.net	speed auto	!
network 172.16.30.0	!	interface
255.255.255.0	interface	GigabitEthernet1/0/11
default-router	GigabitEthernet1/0/2	!
172.16.30.1	no switchport	interface
dns-server 8.8.8.8	ip address 192.168.2.3	GigabitEthernet1/0/12
ip dhcp pool Finance.net	255.255.255.0	!
network 172.16.40.0	duplex auto	interface
255.255.255.0	speed auto	GigabitEthernet1/0/13
default-router	!	!
	•	•

interface	mac-address	deny ip 172.16.30.0
GigabitEthernet1/0/14	000a.418e.5603	0.0.0.255 172.16.10.0
!	ip address 172.16.30.5	0.0.0.255
interface	255.255.255.0	deny ip 172.16.30.0
GigabitEthernet1/0/15	ip access-group vlans-	0.0.0.255 172.16.20.0
I	block in	0.0.0.255
interface	1	deny ip 172.16.30.0
	interface Vlan40	• •
GigabitEthernet1/0/16		0.0.0.255 172.16.40.0
!	mac-address	0.0.0.255
interface	000a.418e.5604	deny ip 172.16.30.0
GigabitEthernet1/0/17	ip address 172.16.40.5	0.0.0.255 172.16.50.0
!	255.255.255.0	0.0.0.255
interface	ip access-group vlans-	deny ip 172.16.40.0
GigabitEthernet1/0/18	block in	0.0.0.255 172.16.10.0
!	!	0.0.0.255
interface	interface Vlan50	deny ip 172.16.40.0
GigabitEthernet1/0/19	mac-address	0.0.0.255 172.16.20.0
1	000a.418e.5605	0.0.0.255
interface	ip address 172.16.50.5	deny ip 172.16.40.0
GigabitEthernet1/0/20	255.255.255.0	0.0.0.255 172.16.30.0
digabitethernet1/0/20		
!	ip access-group vlans-	0.0.0.255
interface	block in	deny ip 172.16.40.0
GigabitEthernet1/0/21	!	0.0.0.255 172.16.50.0
!	router ospf 1	0.0.0.255
interface	router-id 9.9.9.9	deny ip 172.16.50.0
GigabitEthernet1/0/22	log-adjacency-changes	0.0.0.255 172.16.10.0
!	network 0.0.0.0	0.0.0.255
interface	255.255.255.255 area 0	deny ip 172.16.50.0
GigabitEthernet1/0/23	!	0.0.0.255 172.16.20.0
I	ip default-gateway	0.0.0.255
interface	192.168.1.1	deny ip 172.16.50.0
GigabitEthernet1/0/24	ip classless	0.0.0.255 172.16.30.0
i digabitetilerilet1/0/24	•	0.0.0.255
: !fo	ip route 0.0.0.0 0.0.0.0	
interface	GigabitEthernet1/0/1	deny ip 172.16.50.0
GigabitEthernet1/1/1	ip route 0.0.0.0 0.0.0.0	0.0.0.255 172.16.40.0
!	GigabitEthernet1/0/2 5	0.0.0.255
interface	!	permit ip any any
GigabitEthernet1/1/2	ip flow-export version 9	!
!	!	banner motd ^C
interface	!	#######################################
GigabitEthernet1/1/3	ip access-list extended	#######
1	vlans-block	Welcome
interface	deny ip 172.16.10.0	HQ-DSW
GigabitEthernet1/1/4	0.0.0.255 172.16.20.0	#######################################
!	0.0.0.255	
•		########
interface Vlan1	deny ip 172.16.10.0	^C
ip address 192.168.3.1	0.0.0.255 172.16.30.0	!
255.255.255.0	0.0.0.255	logging 192.168.1.60
!	deny ip 172.16.10.0	line con 0
interface Vlan10	0.0.0.255 172.16.40.0	!
mac-address	0.0.0.255	line aux 0
000a.418e.5601	deny ip 172.16.10.0	!
ip address 172.16.10.5	0.0.0.255 172.16.50.0	line vty 0
255.255.255.0	0.0.0.255	password cisco
ip access-group vlans-	deny ip 172.16.20.0	login
block in	0.0.0.255 172.16.10.0	line vty 1 4
I I	0.0.0.255	•
•		login
interface Vlan20	deny ip 172.16.20.0	ntp server 192.168.1.70
mac-address	0.00.255.173.16.20.0	
	0.0.0.255 172.16.30.0	
000a.418e.5602	0.0.0.255	end
000a.418e.5602 ip address 172.16.20.5		end
	0.0.0.255 deny ip 172.16.20.0 0.0.0.255 172.16.40.0	end
ip address 172.16.20.5	0.0.0.255 deny ip 172.16.20.0	end
ip address 172.16.20.5 255.255.255.0	0.0.0.255 deny ip 172.16.20.0 0.0.0.255 172.16.40.0	end

0.0.0.255

interface Vlan30

2-HQ-router1

Building configuration...

Current configuration: 1481 bytes!
version 15.1
no service timestamps log datetime msec
no service timestamps debug
datetime msec
no service password-encryption!
hostname HQ-router1!
no ip cef
no ipv6 cef!
license udi pid CISCO2901/K9 sn
FTX1524DT3H-!
spanning-tree mode pvst!
interface GigabitEthernet0/0
ip address 192.168.1.2 255.255.0
duplex auto

speed auto

standby 1 ip 192.168.1.1

standby 1 priority 150

standby 1 preempt interface GigabitEthernet0/1 no ip address duplex auto speed auto shutdown interface SerialO/O/O ip address 200.1.2.1 255.255.255.252 clock rate 2000000 interface SerialO/0/1 ip address 200.1.1.1 255.255.255.252 clock rate 2000000 interface SerialO/1/0 ip address 201.1.1.2 255.255.255.252 clock rate 2000000 interface SerialO/1/1 no ip address clock rate 2000000 shutdown interface Vlan1 no ip address shutdown router ospf 1 router-id 1.1.1.1 log-adjacency-changes network 200.1.2.0 0.0.0.3 area 2 network 200.1.1.0 0.0.0.3 area 1 network 192.168.1.0 0.0.0.255 area 0

ip nat inside source list 10 interface SerialO/1/0 overload ip classless ip route 0.0.0.0 0.0.0.0 Serial0/1/0 ip flow-export version 9 access-list 10 permit any banner motd ^C Welcome HQ-router1 ^C logging 192.168.1.60 line con 0 line aux 0 line vty 0 password cisco login line vty 14 login ntp server 192.168.1.70

end

3-HQ-router2

Building configuration...

```
Current configuration: 1208 bytes
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname HQ-router2
!
no ip cef
no ipv6 cef
license udi pid CISCO2901/K9 sn FTX1524162Q-
!
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 192.168.2.2 255.255.255.0
ip ospf 1 area 0
duplex auto
speed auto
standby 1 ip 192.168.1.1
standby 1 preempt
interface GigabitEthernet0/1
no ip address
duplex auto
```

```
speed auto
shutdown
interface Serial0/0/0
ip address 200.1.4.1 255.255.255.252
ip ospf 1 area 2
interface Serial0/0/1
ip address 200.1.3.1 255.255.255.252
ip ospf 1 area 1
clock rate 2000000
interface SerialO/1/0
ip address 201.1.2.2 255.255.255.252
clock rate 2000000
interface SerialO/1/1
no ip address
clock rate 2000000
shutdown
ļ
interface Vlan1
no ip address
shutdown
!
router ospf 1
router-id 2.2.2.2
log-adjacency-changes
ļ
ip classless
ip flow-export version 9
```

```
banner motd ^C
Welcome
HQ-router2
^C
!
line con 0
!
line aux 0
ļ
line vty 0 4
login
ļ
ntp server 192.168.1.70
!
```

end

4-Layer3 SW

Building configuration... switchport port-security switchport port-security macaddress sticky switchport port-security macswitchport port-security address sticky Current configuration: 6963 violation restrict bytes switchport port-security violation restrict spanning-tree portfast switchport port-security macshutdown version 12.2(37)SE1 address sticky 0050.0F75.6CD8 no service timestamps log spanning-tree portfast interface FastEthernet0/6 datetime msec no service timestamps debug switchport access vlan 20 datetime msec interface FastEthernet0/3 switchport mode access no service password-encryption switchport access vlan 10 switchport port-security switchport mode access switchport port-security machostname HQ-ASW2 switchport port-security address sticky switchport port-security switchport port-security macaddress sticky violation restrict ip arp inspection vlan 1,10,20,40,50 switchport port-security switchport port-security macviolation restrict address sticky 00E0.B09A.BA68 ļ spanning-tree portfast spanning-tree portfast spanning-tree mode pvst shutdown interface FastEthernet0/7 interface Port-channel2 interface FastEthernet0/4 switchport access vlan 20 switchport access vlan 10 switchport mode access interface FastEthernet0/1 switchport mode access switchport port-security switchport access vlan 10 switchport port-security switchport port-security macswitchport mode access address sticky switchport port-security macswitchport port-security address sticky switchport port-security violation restrict switchport port-security macswitchport port-security address sticky violation restrict switchport port-security macaddress sticky 0040.0BC3.9041 switchport port-security spanning-tree portfast violation restrict spanning-tree portfast shutdown switchport port-security mac-! address sticky 00D0.BAE3.3942 interface FastEthernet0/8 spanning-tree portfast interface FastEthernet0/5 switchport access vlan 20 switchport access vlan 10 switchport mode access interface FastEthernet0/2 switchport mode access switchport port-security switchport access vlan 10 switchport port-security switchport port-security macswitchport mode access address sticky

switchport port-security	!	switchport port-security
violation restrict	interface FastEthernet0/12	switchport port-security mac-
spanning-tree portfast	switchport access vlan 30	address sticky
shutdown	switchport mode access	switchport port-security violation restrict
!	switchport port-security	spanning-tree portfast
interface FastEthernet0/9	switchport port-security mac-	shutdown
switchport access vlan 20	address sticky	
switchport mode access	switchport port-security	!
switchport port-security	violation restrict	interface FastEthernet0/16
switchport port-security mac-	switchport port-security mac- address sticky 0002.17BC.7B45	switchport access vlan 40
address sticky	spanning-tree portfast	switchport mode access
switchport port-security violation restrict	!	switchport port-security
		switchport port-security mac-
spanning-tree portfast	interface FastEthernet0/13	address sticky
shutdown	switchport access vlan 30	switchport port-security violation restrict
!	switchport mode access	switchport port-security mac-
interface FastEthernet0/10	switchport port-security	address sticky 0001.4344.ADD5
switchport access vlan 20	switchport port-security mac- address sticky	spanning-tree portfast
switchport mode access		!
switchport port-security	switchport port-security violation restrict	interface FastEthernet0/17
switchport port-security mac- address sticky	spanning-tree portfast	switchport access vlan 40
switchport port-security	shutdown	switchport mode access
violation restrict	!	switchport port-security
spanning-tree portfast	interface FastEthernet0/14	switchport port-security mac-
shutdown	switchport access vlan 30	address sticky
1	switchport mode access	switchport port-security violation restrict
interface FastEthernet0/11	switchport port-security	switchport port-security mac-
switchport access vlan 30	switchport port-security mac-	address sticky 0050.0F04.7513
switchport mode access	address sticky	spanning-tree portfast
switchport port-security	switchport port-security violation restrict	!
switchport port-security mac-	spanning-tree portfast	interface FastEthernet0/18
address sticky	shutdown	switchport access vlan 40
switchport port-security violation restrict	!	switchport mode access
switchport port-security mac-	interface FastEthernet0/15	switchport port-security
address sticky 0030.F26B.C6BA	switchport access vlan 30	switchport port-security mac- address sticky
spanning-tree portfast	switchport mode access	· · · · · · · · · · · · · · · · · · ·

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switchport port-security violation restrict	!	channel-group 2 mode passive
spanning-tree portfast	interface FastEthernet0/22	!
shutdown	switchport access vlan 50	interface GigabitEthernet0/2
	switchport mode access	ip arp inspection trust
!	switchport port-security	channel-protocol lacp
interface FastEthernet0/19	switchport port-security mac-	channel-group 2 mode passive
switchport access vlan 40	address sticky	!
switchport mode access	switchport port-security violation restrict	interface Vlan1
switchport port-security		ip address 192.168.3.3
switchport port-security mac- address sticky	switchport port-security mac- address sticky 0030.A372.1D18	255.255.255.0
switchport port-security	spanning-tree portfast	!
violation restrict	1	ip default-gateway 192.168.3.1
spanning-tree portfast	interface FastEthernet0/23	ip classless
shutdown	switchport access vlan 50	!
!	switchport mode access	ip flow-export version 9
interface FastEthernet0/20	switchport port-security	!
switchport access vlan 40	switchport port-security mac-	banner motd ^C
switchport mode access	address sticky	#######################################
switchport port-security	switchport port-security violation restrict	### Welcome
switchport port-security mac- address sticky	spanning-tree portfast	HQ-ASW2
switchport port-security	shutdown	#######################################
violation restrict	1	###
spanning-tree portfast	interface FastEthernet0/24	
shutdown	switchport access vlan 50	logging 192.168.3.60
1	switchport mode access	line con 0
interface FastEthernet0/21	switchport port-security	!
switchport access vlan 50	switchport port-security mac-	line aux 0
switchport mode access	address sticky	!
switchport port-security	switchport port-security violation restrict	line vty 0
switchport port-security mac-	spanning-tree portfast	password cisco
address sticky	shutdown	login
switchport port-security violation restrict	!	line vty 1 4
switchport port-security mac-	interface GigabitEthernet0/1	login
address sticky 0001.9626.43C1	ip arp inspection trust	!
spanning-tree portfast		ntp server 192.168.3.70
	channel-protocol lacp	

Branch A: -

1-branch A-Router

Building configuration	ip dhcp pool SW2.NET	ip address 192.168.100.1 255.255.255.0
Current configuration :	network 192.168.110.0 255.255.255.0	ip nat inside
Current configuration : 1676 bytes	default-router 192.168.110.1	duplex auto
! version 15.1	dns-server 8.8.8.8	speed auto
no service timestamps log datetime msec	! no ip cef	interface Serial0/0/0
no service timestamps	no ipv6 cef	ip address 200.1.5.2 255.255.255.252
debug datetime msec	!	ip nat inside
no service password- encryption	license udi pid CISCO2901/K9 sn FTX152493K0-	clock rate 2000000
hostname baranch-A-	!	interface Serial0/0/1
router !	spanning-tree mode pvst	ip address 200.1.1.2 255.255.255.252
ip dhcp excluded-address	!	!
192.168.100.0 192.168.100.50	interface	interface Serial0/1/0
ip dhcp excluded-address	GigabitEthernet0/0	ip address 200.1.3.2 255.255.255.252
192.168.110.0 192.168.110.50	ip address 192.168.110.1 255.255.255.0	!
!	ip nat inside	interface Serial0/1/1
ip dhcp pool SW1.NET	duplex auto	no ip address
network 192.168.100.0	speed auto	clock rate 2000000
255.255.255.0	1	shutdown
default-router 192.168.100.1	interface GigabitEthernet0/1	! interface Vlan1
dns-server 8.8.8.8	OIBapitEttiettiet0/ 1	interface Vlan1

no ip address	ip flow-export version 9	line aux 0
shutdown	access-list 1 permit any	!
1	!	line vty 0
router ospf 1	banner motd ^C	password cisco
router-id 4.4.4.4	#######################################	login
log-adjacency-changes	#	line vty 1 4
network 0.0.0.0	Welcome	login
255.255.255.255 area 1	baranch-A-router	!
!	#####################	ntp server 192.168.3.70
ip classless	#	!
ip route 0.0.0.0 0.0.0.0	!	·
Serial0/0/1	logging 192.168.3.60	end
ip route 0.0.0.0 0.0.0.0	line con 0	
Serial0/1/0 5	!	
!		

2-branch A-SW1

Building configuration	switchport mode access	switchport port-security
	switchport port-security	violation restrict
Current configuration : 5945 bytes	switchport port-security mac- address sticky	switchport port-security mac- address sticky 0001.C75D.A644
!	switchport port-security	spanning-tree portfast
version 15.0	violation restrict	!
no service timestamps log datetime msec	switchport port-security mac- address sticky 0001.6449.66CE	interface FastEthernet0/6 switchport mode access
no service timestamps debug	spanning-tree portfast	switchport port-security
		switchport port-security mac-
no service password-encryption	interface FastEthernet0/3	address sticky
!	switchport mode access	switchport port-security violation restrict
hostname baranch-A-SW1	switchport port-security	
!	switchport port-security mac- address sticky	spanning-tree portfast
ip arp inspection vlan 1	•	
!	switchport port-security violation restrict	! :ntoufoos FootFth our at 0 /7
ip dhcp snooping vlan 1	switchport port-security mac-	interface FastEthernet0/7
no ip dhcp snooping	address sticky 0040.0B8D.02C2	switchport mode access
information option	spanning-tree portfast	switchport port-security
ip dhcp snooping	1	switchport port-security mac- address sticky
1	interface FastEthernet0/4	·
spanning-tree mode pvst	switchport mode access	switchport port-security violation restrict
spanning-tree extend system-id	switchport port-security	spanning-tree portfast
1	switchport port-security mac-	shutdown
interface FastEthernet0/1	address sticky	!
switchport mode access	switchport port-security violation restrict	interface FastEthernet0/8
switchport port-security	switchport port-security mac-	switchport mode access
switchport port-security mac- address sticky	address sticky 0050.0F8A.2506	switchport port-security
switchport port-security	spanning-tree portfast	switchport port-security mac- address sticky
violation restrict		•
Violation restrict		switchnort nort-security
switchport port-security mac-	interface FastEthernet0/5	switchport port-security violation restrict
switchport port-security mac- address sticky 0002.16C5.A923		
switchport port-security mac- address sticky 0002.16C5.A923 spanning-tree portfast	interface FastEthernet0/5 switchport mode access switchport port-security	violation restrict
switchport port-security mac- address sticky 0002.16C5.A923	interface FastEthernet0/5 switchport mode access	violation restrict spanning-tree portfast

interface FastEthernet0/9	shutdown	switchport port-security violation restrict
switchport mode access	!	spanning-tree portfast
switchport port-security	interface FastEthernet0/13	shutdown
switchport port-security mac-	switchport mode access	
address sticky	switchport port-security	1
switchport port-security violation restrict	switchport port-security mac- address sticky	interface FastEthernet0/17 switchport mode access
spanning-tree portfast	•	•
shutdown	switchport port-security violation restrict	switchport port-security
· !	spanning-tree portfast	switchport port-security mac- address sticky
interface FastEthernet0/10	shutdown	switchport port-security
switchport mode access	!	violation restrict
·	interface FastEthernet0/14	spanning-tree portfast
switchport port-security	·	shutdown
switchport port-security mac- address sticky	switchport mode access	!
switchport port-security	switchport port-security	interface FastEthernet0/18
violation restrict	switchport port-security mac- address sticky	switchport mode access
spanning-tree portfast	switchport port-security	switchport port-security
shutdown	violation restrict	switchport port-security mac-
1	spanning-tree portfast	address sticky
interface FastEthernet0/11	shutdown	switchport port-security violation restrict
switchport mode access	!	
switchport port-security	interface FastEthernet0/15	spanning-tree portfast
switchport port-security mac-	switchport mode access	shutdown
address sticky	switchport port-security	!
switchport port-security	switchport port-security mac-	interface FastEthernet0/19
violation restrict	address sticky	switchport mode access
spanning-tree portfast	switchport port-security	switchport port-security
shutdown	violation restrict	switchport port-security mac-
!	spanning-tree portfast	address sticky
interface FastEthernet0/12	shutdown	switchport port-security
switchport mode access	!	violation restrict
switchport port-security	interface FastEthernet0/16	spanning-tree portfast
switchport port-security mac-	switchport mode access	shutdown
address sticky	switchport port-security	1
switchport port-security	switchport port-security mac-	interface FastEthernet0/20
violation restrict	address sticky	switchport mode access
spanning-tree portfast		switchport port-security

switchport port-security macinterface FastEthernet0/23 ip address 192.168.100.2 address sticky 255.255.255.0 switchport mode access switchport port-security switchport port-security violation restrict ip default-gateway switchport port-security mac-192.168.100.1 spanning-tree portfast address sticky shutdown switchport port-security violation restrict banner motd ^C interface FastEthernet0/21 spanning-tree portfast switchport mode access shutdown Welcome switchport port-security baranch-A-SW1 switchport port-security macinterface FastEthernet0/24 address sticky ^С switchport mode access switchport port-security switchport port-security logging 192.168.3.60 violation restrict switchport port-security macline con 0 spanning-tree portfast address sticky shutdown switchport port-security line vty 0 violation restrict password cisco interface FastEthernet0/22 spanning-tree portfast login switchport mode access shutdown line vty 14 switchport port-security ! login interface GigabitEthernet0/1 switchport port-security macaddress sticky line vty 5 15 ip arp inspection trust switchport port-security login ip dhcp snooping trust violation restrict ntp server 192.168.3.70 spanning-tree portfast interface GigabitEthernet0/2 shutdown ! end !

2-branch A-SW2

Building configuration	no service timestamps debug datetime msec	no ip dhcp snooping information option
Current configuration : 5953	no service password-encryption	ip dhcp snooping
bytes	!	!
1	hostname baranch-A-SW2	spanning-tree mode pvst
version 15.0	ip arp inspection vlan 1	spanning-tree extend system-id
no service timestamps log	!	!
datetime msec	ip dhcp snooping vlan 1	interface FastEthernet0/1

interface Vlan1

switchport mode access	switchport port-security mac-	switchport port-security mac-
switchport port-security	address sticky 000B.BE4C.4756	address sticky
	spanning-tree portfast	switchport port-security
switchport port-security mac- address sticky	!	violation restrict
switchport port-security	interface FastEthernet0/5	spanning-tree portfast
violation restrict	switchport mode access	shutdown
switchport port-security mac-	·	!
address sticky 0000.0C0A.A1EA	switchport port-security	interface FastEthernet0/9
spanning-tree portfast	switchport port-security mac- address sticky	switchport mode access
1	·	-
interface FastEthernet0/2	switchport port-security violation restrict	switchport port-security
switchport mode access	switchport port-security mac-	switchport port-security mac- address sticky
switchport port-security	address sticky 000C.85CA.83BB	switchport port-security
	spanning-tree portfast	violation restrict
switchport port-security mac- address sticky	!	spanning-tree portfast
switchport port-security	interface FastEthernet0/6	shutdown
violation restrict	switchport mode access	!
switchport port-security mac- address sticky 00E0.A3DB.B9B0	switchport port-security	interface FastEthernet0/10
spanning-tree portfast	switchport port-security mac-	switchport mode access
1	address sticky	switchport port-security
interface FastEthernet0/3	switchport port-security violation restrict	switchport port-security mac-
·		address sticky
switchport mode access	spanning-tree portfast	switchport port-security
switchport port-security	shutdown	violation restrict
switchport port-security mac- address sticky	!	spanning-tree portfast
	interface FastEthernet0/7	shutdown
switchport port-security violation restrict	switchport mode access	!
switchport port-security mac-	switchport port-security	interface FastEthernet0/11
address sticky 0009.7CB3.7A62	switchport port-security mac-	switchport mode access
spanning-tree portfast	address sticky	switchport port-security
!	switchport port-security	switchport port-security mac-
interface FastEthernet0/4	violation restrict	address sticky
switchport mode access	spanning-tree portfast	switchport port-security
switchport port-security	shutdown	violation restrict
	!	spanning-tree portfast
switchport port-security mac- address sticky	interface FastEthernet0/8	shutdown
switchport port-security	switchport mode access	!
violation restrict	switchport port-security	interface FastEthernet0/12
	•	

switchport mode access	!	spanning-tree portfast
switchport port-security	interface FastEthernet0/16	shutdown
switchport port-security mac-	switchport mode access	!
address sticky	switchport port-security	interface FastEthernet0/20
switchport port-security violation restrict	switchport port-security mac-	switchport mode access
spanning-tree portfast	address sticky	switchport port-security
shutdown	switchport port-security violation restrict	switchport port-security mac-
!	spanning-tree portfast	address sticky
interface FastEthernet0/13	shutdown	switchport port-security violation restrict
switchport mode access	!	spanning-tree portfast
switchport port-security	interface FastEthernet0/17	shutdown
switchport port-security mac-	switchport mode access	!
address sticky	switchport port-security	interface FastEthernet0/21
switchport port-security violation restrict	switchport port-security mac-	switchport mode access
spanning-tree portfast	address sticky	switchport port-security
shutdown	switchport port-security violation restrict	switchport port-security mac- address sticky
!	spanning-tree portfast	switchport port-security
interface FastEthernet0/14	shutdown	violation restrict
interface FastEthernet0/14 switchport mode access	shutdown !	violation restrict spanning-tree portfast
•		
switchport mode access	! interface FastEthernet0/18 switchport mode access	spanning-tree portfast shutdown
switchport mode access switchport port-security switchport port-security mac-	! interface FastEthernet0/18 switchport mode access switchport port-security	spanning-tree portfast shutdown ! interface FastEthernet0/22
switchport mode access switchport port-security switchport port-security mac- address sticky	! interface FastEthernet0/18 switchport mode access	spanning-tree portfast shutdown ! interface FastEthernet0/22 switchport mode access
switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security	! interface FastEthernet0/18 switchport mode access switchport port-security switchport port-security mac-	spanning-tree portfast shutdown ! interface FastEthernet0/22 switchport mode access switchport port-security
switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict	! interface FastEthernet0/18 switchport mode access switchport port-security switchport port-security mac- address sticky	spanning-tree portfast shutdown ! interface FastEthernet0/22 switchport mode access
switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast	! interface FastEthernet0/18 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security	spanning-tree portfast shutdown ! interface FastEthernet0/22 switchport mode access switchport port-security switchport port-security mac-
switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown	! interface FastEthernet0/18 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict	spanning-tree portfast shutdown ! interface FastEthernet0/22 switchport mode access switchport port-security switchport port-security mac- address sticky
switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown !	! interface FastEthernet0/18 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast	spanning-tree portfast shutdown ! interface FastEthernet0/22 switchport mode access switchport port-security switchport port-security macaddress sticky switchport port-security
switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown ! interface FastEthernet0/15	! interface FastEthernet0/18 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown	spanning-tree portfast shutdown ! interface FastEthernet0/22 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict
switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown ! interface FastEthernet0/15 switchport mode access switchport port-security switchport port-security	! interface FastEthernet0/18 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown ! interface FastEthernet0/19 switchport mode access	spanning-tree portfast shutdown ! interface FastEthernet0/22 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown !
switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown ! interface FastEthernet0/15 switchport mode access switchport port-security switchport port-security switchport port-security mac- address sticky	! interface FastEthernet0/18 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown ! interface FastEthernet0/19 switchport mode access switchport port-security	spanning-tree portfast shutdown ! interface FastEthernet0/22 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown ! interface FastEthernet0/23
switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown ! interface FastEthernet0/15 switchport mode access switchport port-security switchport port-security	! interface FastEthernet0/18 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown ! interface FastEthernet0/19 switchport mode access switchport port-security switchport port-security	spanning-tree portfast shutdown ! interface FastEthernet0/22 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown !
switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown ! interface FastEthernet0/15 switchport mode access switchport port-security switchport port-security switchport port-security switchport port-security	! interface FastEthernet0/18 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown ! interface FastEthernet0/19 switchport mode access switchport port-security	spanning-tree portfast shutdown ! interface FastEthernet0/22 switchport mode access switchport port-security switchport port-security mac- address sticky switchport port-security violation restrict spanning-tree portfast shutdown ! interface FastEthernet0/23

switchport port-security ip dhcp snooping trust logging 192.168.3.60 violation restrict ! spanning-tree portfast interface GigabitEthernet0/2 line con 0 shutdown ! interface Vlan1 line vty 0 interface FastEthernet0/24 ip address 192.168.110.2 password cisco switchport mode access 255.255.255.0 login switchport port-security ! line vty 14 switchport port-security macip default-gateway login 192.168.110.1 address sticky line vty 5 15 switchport port-security ļ violation restrict login banner motd ^C spanning-tree portfast shutdown ntp server 192.168.3.70 ! welcome end interface GigabitEthernet0/1 baranch-A-SW2

ip arp inspection trust

. Branch B: -

Configuration

1-branch B-router

Building configuration	no ip cef	ip access-group valns-block in
	no ipv6 cef	!
Current configuration : 2265	!	interface GigabitEthernet0/1
bytes	license udi pid CISCO2901/K9 sn	no ip address
!	FTX15246VBP-	duplex auto
version 15.1	!	speed auto
no service timestamps log datetime msec	spanning-tree mode pvst	shutdown
	!	!
no service timestamps debug datetime msec	interface GigabitEthernet0/0	interface Serial0/0/0
no service password-encryption	no ip address	no ip address
!	duplex auto	-
hostname baranch-B-router	speed auto	clock rate 2000000
!	!	shutdown
	interface GigabitEthernet0/0.1	!
ip dhcp excluded-address 192.168.120.0 192.168.120.50	encapsulation dot1Q 1 native	interface Serial0/0/1
ip dhcp excluded-address 192.168.130.0 192.168.130.50	ip address 20.0.0.1 255.0.0.0	ip address 200.1.5.1 255.255.255.252
	ip access-group vlans-block in	!
!	!	interface Serial0/1/0
ip dhcp pool Engineering.net	interface	no ip address
network 192.168.120.0 255.255.255.0	GigabitEthernet0/0.120	clock rate 2000000
default-router 192.168.120.1	encapsulation dot1Q 120	shutdown
dns-server 8.8.8.8	ip address 192.168.120.1	!
	255.255.255.0	•
ip dhcp pool HR.net	ip access-group valns-block in	interface Serial0/1/1
network 192.168.130.0 255.255.255.0	!	no ip address
default-router 192.168.130.1	interface	clock rate 2000000
dns-server 8.8.8.8	GigabitEthernet0/0.130	shutdown
	encapsulation dot1Q 130	!
1	ip address 192.168.130.1 255.255.255.0	interface Vlan1

no ip address	1	logging 192.168.3.60
shutdown	access-list 1 permit any	line con 0
!	ip access-list extended valns-	1
router ospf 1	block	line aux 0
router-id 3.3.3.3	deny ip 192.168.120.0 0.0.0.255 192.168.130.0 0.0.0.255	1
log-adjacency-changes	deny ip 192.168.130.0 0.0.0.255	line vty 0
network 0.0.0.0	192.168.120.0 0.0.0.255	password cisco
255.255.255.255 area 1	permit ip any any	login
!	!	line vty 1 4
ip nat inside source static 192.168.130.51 200.1.5.1	banner motd ^C	login
ip nat inside source static	######################################	ntp server 192.168.3.70
192.168.120.51 200.1.5.1	welcome	!
ip classless	baranch-B-router	end
ip route 0.0.0.0 0.0.0.0		
Serial0/0/1	#######################################	
!	#######################################	
	^C	

ip flow-export version 9

1-branch B-SW

!

Building configuration	interface FastEthernet0/2	switchport mode access
	switchport access vlan 120	switchport port-security
Current configuration : 5943	switchport mode access	switchport port-security mac-
pytes	switchport port-security	address sticky
!	switchport port-security mac-	switchport port-security violation restrict
version 15.0	address sticky	spanning-tree portfast
no service timestamps log datetime msec	switchport port-security violation restrict	shutdown
no service timestamps debug	switchport port-security mac-	!
datetime msec	address sticky 0001.9654.B799	interface FastEthernet0/6
no service password-encryption	spanning-tree portfast	switchport access vlan 120
!	!	
hostname branch-B-SW	interface FastEthernet0/3	switchport mode access
!	·	switchport port-security
•	switchport access vlan 120	switchport port-security mac-
ip arp inspection vlan 1,120,130	switchport mode access	address sticky
!	switchport port-security	switchport port-security
ip dhcp snooping vlan 1,120,130	switchport port-security mac-	violation restrict
no ip dhcp snooping	address sticky	spanning-tree portfast
information option	switchport port-security	shutdown
ip dhcp snooping	violation restrict	!
!	spanning-tree portfast	interface FastEthernet0/7
spanning-tree mode pvst	shutdown	switchport access vlan 120
	!	
spanning-tree extend system-id	interface FastEthernet0/4	switchport mode access
!		switchport port-security
interface FastEthernet0/1	switchport access vlan 120	switchport port-security mac-
switchport access vlan 120	switchport mode access	address sticky
switchport mode access	switchport port-security	switchport port-security
•	switchport port-security mac-	violation restrict
switchport port-security	address sticky	spanning-tree portfast
switchport port-security mac- address sticky	switchport port-security	shutdown
•	violation restrict	!
switchport port-security violation restrict	spanning-tree portfast	interface FastEthernet0/8
switchport port-security mac-	shutdown	switchport access vlan 120
address sticky 00D0.9735.CE09	!	
spanning-tree portfast	interface FastEthernet0/5	switchport mode access
		switchport port-security

switchport access vlan 120

switchport port-security macspanning-tree portfast switchport mode access address sticky ! switchport port-security switchport port-security interface FastEthernet0/12 switchport port-security macviolation restrict address sticky switchport access vlan 130 spanning-tree portfast switchport port-security switchport mode access shutdown violation restrict switchport port-security spanning-tree portfast switchport port-security macinterface FastEthernet0/9 shutdown address sticky switchport access vlan 120 switchport port-security interface FastEthernet0/16 switchport mode access violation restrict switchport port-security switchport port-security macswitchport access vlan 130 address sticky 00E0.B008.D10D switchport port-security macswitchport mode access address sticky spanning-tree portfast switchport port-security switchport port-security switchport port-security macviolation restrict interface FastEthernet0/13 address sticky spanning-tree portfast switchport access vlan 130 switchport port-security violation restrict shutdown switchport mode access Ţ spanning-tree portfast switchport port-security interface FastEthernet0/10 shutdown switchport port-security macswitchport access vlan 120 address sticky switchport mode access switchport port-security interface FastEthernet0/17 violation restrict switchport port-security switchport access vlan 130 spanning-tree portfast switchport port-security macswitchport mode access address sticky shutdown switchport port-security switchport port-security switchport port-security macviolation restrict interface FastEthernet0/14 address sticky spanning-tree portfast switchport access vlan 130 switchport port-security violation restrict shutdown switchport mode access į spanning-tree portfast switchport port-security interface FastEthernet0/11 shutdown switchport port-security macswitchport access vlan 130 address sticky switchport mode access interface FastEthernet0/18 switchport port-security violation restrict switchport port-security switchport access vlan 130 spanning-tree portfast switchport port-security macswitchport mode access address sticky shutdown switchport port-security switchport port-security switchport port-security macviolation restrict interface FastEthernet0/15 address sticky switchport port-security macswitchport access vlan 130

address sticky 00D0.BC89.8B63

switchport port-security	interface FastEthernet0/21	!
violation restrict	spanning-tree portfast	ip default-gateway 20.0.0.1
spanning-tree portfast	shutdown	!
shutdown	!	banner motd ^C
!	interface FastEthernet0/22	#######################################
interface FastEthernet0/19	spanning-tree portfast	##########
switchport access vlan 130	shutdown	welcome
switchport mode access	!	branch-B-SW
switchport port-security	•	#######################################
switchport port-security mac-	interface FastEthernet0/23	###########
address sticky	spanning-tree portfast	^C
switchport port-security	shutdown	logging 192.168.3.60
violation restrict	!	line con 0
spanning-tree portfast	interface FastEthernet0/24	!
shutdown	spanning-tree portfast	line vty 0
!	shutdown	password cisco
interface FastEthernet0/20	!	login
switchport access vlan 130	interface GigabitEthernet0/1	line vty 1 4
switchport mode access	ip arp inspection trust	login
switchport port-security	ip dhcp snooping trust	
switchport port-security mac-	switchport mode trunk	line vty 5 15
address sticky	!	login
switchport port-security		!
violation restrict	interface GigabitEthernet0/2	ntp server 192.168.3.70
spanning-tree portfast	!	!
shutdown	interface Vlan1	end
!	ip address 20.0.0.2 255.0.0.0	Ciid

Remote Office:

Configrution

1-Remote Office-Router

```
Building configuration...
                                                            license udi pid CISCO2901/K9 sn FTX1524779C-
Current configuration: 1575 bytes
                                                            spanning-tree mode pvst
!
version 15.1
                                                            interface GigabitEthernet0/0
no service timestamps log datetime msec
                                                            no ip address
no service timestamps debug datetime msec
                                                            duplex auto
no service password-encryption
                                                            speed auto
hostname R_REMOTEOFFICE
                                                            interface GigabitEthernet0/0.10
                                                            encapsulation dot1Q 10
ip dhcp excluded-address 192.168.140.10
                                                            no ip address
192.168.140.50
ip dhcp excluded-address 192.168.150.10
                                                            interface GigabitEthernet0/0.140
192.168.150.50
                                                            encapsulation dot1Q 140
!
                                                            ip address 192.168.140.1 255.255.255.0
ip dhcp pool users
ip dhcp pool 140
                                                            interface GigabitEthernet0/0.150
network 192.168.140.0 255.255.255.0
                                                            encapsulation dot1Q 150
default-router 192.168.140.1
                                                            ip address 192.168.150.1 255.255.255.0
dns-server 8.8.8.8
ip dhcp pool 150
                                                            interface GigabitEthernet0/1
network 192.168.150.0 255.255.255.0
                                                            no ip address
default-router 192.168.150.1
                                                            duplex auto
dns-server 8.8.8.8
                                                            speed auto
                                                            shutdown
no ip cef
no ipv6 cef
                                                            interface Serial0/0/0
```

```
ļ
ip address 200.1.2.2 255.255.255.0
!
                                                             router ospf 1
interface Serial0/0/1
                                                             router-id 3.3.3.3
ip address 200.1.4.2 255.255.255.0
                                                             log-adjacency-changes
                                                             network 0.0.0.0 255.255.255.255 area 2
interface SerialO/1/0
no ip address
                                                             ip classless
clock rate 2000000
shutdown
                                                             ip flow-export version 9
!
                                                             line con 0
interface Serial0/1/1
                                                             !
                                                             line aux 0
no ip address
clock rate 2000000
                                                             !
                                                             line vty 0 4
shutdown
!
                                                             login
interface Vlan1
                                                             end
no ip address
```

shutdown

2-Remote Office-SW

Building configuration... switchport mode access switchport port-security **Current configuration: 4783 bytes** switchport port-security mac-address sticky switchport port-security violation restrict version 15.0 no service timestamps log datetime msec interface FastEthernet0/4 no service timestamps debug datetime msec switchport access vlan 140 no service password-encryption switchport mode access Ţ switchport port-security hostname Switch switchport port-security mac-address sticky switchport port-security violation restrict spanning-tree mode pvst spanning-tree extend system-id interface FastEthernet0/5 switchport access vlan 140 interface FastEthernet0/1 switchport mode access switchport access vlan 140 switchport port-security switchport mode access switchport port-security mac-address sticky switchport port-security switchport port-security violation restrict switchport port-security mac-address sticky switchport port-security violation restrict interface FastEthernet0/6 switchport port-security mac-address sticky switchport access vlan 140 00D0.D32E.012E switchport mode access ! switchport port-security interface FastEthernet0/2 switchport port-security mac-address sticky switchport access vlan 140 switchport port-security violation restrict switchport mode access switchport port-security interface FastEthernet0/7 switchport port-security mac-address sticky switchport access vlan 140 switchport port-security violation restrict switchport mode access switchport port-security mac-address sticky switchport port-security 0090.0CC8.8E31 switchport port-security mac-address sticky ! switchport port-security violation restrict interface FastEthernet0/3 switchport access vlan 140

```
interface FastEthernet0/8
                                                              switchport port-security violation restrict
switchport access vlan 140
                                                              switchport port-security mac-address sticky
                                                              00E0.A342.4EB0
switchport mode access
switchport port-security
                                                              interface FastEthernet0/13
switchport port-security mac-address sticky
                                                              switchport access vlan 150
switchport port-security violation restrict
                                                              switchport mode access
                                                              switchport port-security
interface FastEthernet0/9
                                                              switchport port-security mac-address sticky
switchport access vlan 140
                                                              switchport port-security violation restrict
switchport mode access
switchport port-security
                                                              interface FastEthernet0/14
switchport port-security mac-address sticky
                                                              switchport access vlan 150
switchport port-security violation restrict
                                                              switchport mode access
                                                              switchport port-security
interface FastEthernet0/10
                                                              switchport port-security mac-address sticky
switchport access vlan 140
                                                              switchport port-security violation restrict
switchport mode access
switchport port-security
                                                              interface FastEthernet0/15
switchport port-security mac-address sticky
                                                              switchport access vlan 150
switchport port-security violation restrict
                                                              switchport mode access
                                                              switchport port-security
interface FastEthernet0/11
                                                              switchport port-security mac-address sticky
switchport access vlan 150
                                                              switchport port-security violation restrict
switchport mode access
                                                              !
switchport port-security
                                                              interface FastEthernet0/16
switchport port-security mac-address sticky
                                                              switchport access vlan 150
switchport port-security violation restrict
                                                              switchport mode access
switchport port-security mac-address sticky
00D0.BAD2.462C
                                                              switchport port-security
                                                              switchport port-security mac-address sticky
interface FastEthernet0/12
                                                              switchport port-security violation restrict
switchport access vlan 150
switchport mode access
                                                              interface FastEthernet0/17
switchport port-security
                                                              switchport access vlan 150
                                                              switchport mode access
switchport port-security mac-address sticky
```

```
!
switchport port-security
switchport port-security mac-address sticky
                                                             interface FastEthernet0/22
switchport port-security violation restrict
                                                             shutdown
interface FastEthernet0/18
                                                             interface FastEthernet0/23
switchport access vlan 150
                                                             shutdown
switchport mode access
                                                             interface FastEthernet0/24
switchport port-security
switchport port-security mac-address sticky
                                                             shutdown
switchport port-security violation restrict
                                                             !
!
                                                             interface GigabitEthernet0/1
interface FastEthernet0/19
                                                             switchport mode trunk
switchport access vlan 150
                                                             interface GigabitEthernet0/2
switchport mode access
switchport port-security
switchport port-security mac-address sticky
                                                             interface Vlan1
switchport port-security violation restrict
                                                             no ip address
                                                             shutdown
interface FastEthernet0/20
                                                             line con 0
switchport access vlan 150
switchport mode access
                                                             line vty 04
switchport port-security
                                                             login
                                                             line vty 5 15
switchport port-security mac-address sticky
switchport port-security violation restrict
                                                             login
interface FastEthernet0/21
                                                             end
shutdown
```