"Designing and Implementing a Network Infrastructure for a Startup Company"

Digital Egypt Pioneers Initiative (DEPI)

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Menna Amr

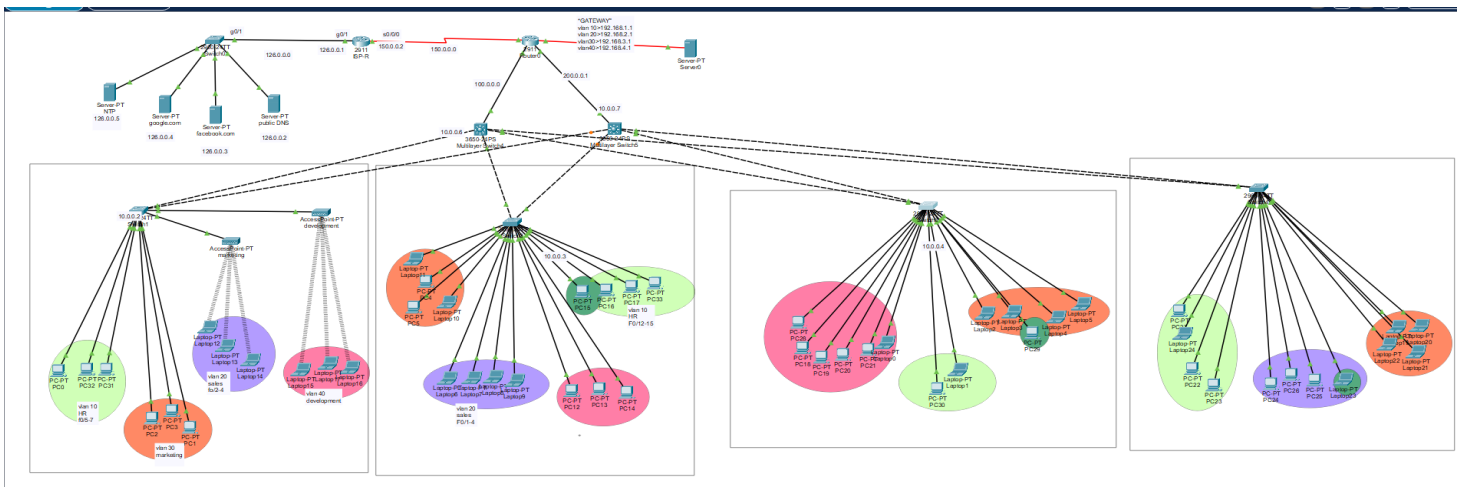**Sandy Tamer**

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Presented to: Eng/ Mohamed Ramadan

Scenario

➤ A tech startup that needs a scalable network to support 50 employees, with departments such as Development, Marketing, Sales, and HR.

➤ The company requires internal and external connectivity, secure communication, remote access, and scalability for future growth.

Topology

Access Switches:

We used 4 Access switches and configured them with:

- Basic configuration
    - Hostname
    - Enable secret and VTY password (cisco)
    - Welcome Message
    - Encrypt all password
- Create VLAN 10 (HR),VLAN 20 (sales), VLAN 30(Marketing),VLAN 40 (Development)
- Assign port to VLAN
- Config trunk port
- Config access port as portfast
- Enable Remote Access
- Config port security

Access Switches configuration

ASW1

MANS-ASW1#show running-config

Building configuration...

Current configuration : 3355 bytes

!

version 15.0

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

```
!
hostname MANS-ASW1
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport access vlan 30
 switchport trunk allowed vlan 30
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
```

```
  spanning-tree bpduguard enable
!
interface FastEthernet0/2
 switchport access vlan 20
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
 spanning-tree bpduguard enable
!
interface FastEthernet0/3
 switchport access vlan 20
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
 spanning-tree bpduguard enable
!
interface FastEthernet0/4
```

```
  switchport access vlan 20

  switchport mode access

  switchport port-security mac-address sticky

  switchport port-security violation restrict

  spanning-tree portfast

  spanning-tree guard root

  spanning-tree bpduguard enable

!

interface FastEthernet0/5

 switchport access vlan 10

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/6

 switchport access vlan 10

 switchport mode access

 switchport port-security mac-address sticky
```

```
   switchport port-security violation restrict

   spanning-tree portfast

   spanning-tree guard root

   spanning-tree bpduguard enable

!

interface FastEthernet0/7

 switchport access vlan 10

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/8

 switchport access vlan 40

 switchport trunk allowed vlan 40

 switchport mode access

 spanning-tree guard root

!

interface FastEthernet0/9
```

```
 shutdown
!
interface FastEthernet0/10
 shutdown
!
interface FastEthernet0/11
 shutdown
!
interface FastEthernet0/12
 shutdown
!
interface FastEthernet0/13
 shutdown
!
interface FastEthernet0/14
 shutdown
!
interface FastEthernet0/15
 shutdown
!
interface FastEthernet0/16
```

```
 shutdown
!
interface FastEthernet0/17
 shutdown
!
interface FastEthernet0/18
 shutdown
!
interface FastEthernet0/19
 shutdown
!
interface FastEthernet0/20
 shutdown
!
interface FastEthernet0/21
 shutdown
!
interface FastEthernet0/22
 shutdown
!
interface FastEthernet0/23
```

```
 shutdown

!

interface FastEthernet0/24

 shutdown

!

interface GigabitEthernet0/1

 switchport mode trunk

 channel-protocol pagp

!

interface GigabitEthernet0/2

 switchport mode trunk

 channel-protocol pagp

!

interface Vlan1

 ip address 10.0.0.2 255.0.0.0

!

ip default-gateway 10.0.0.6

!

banner motd ^C

##################################################

    WELCOME TO MANS-ASW1
```

```
####################################################

^C

!

!

!

line con 0

 password 7 0822455D0A16

 login

!

line vty 0

 password 7 0822455D0A16

 login

line vty 1 4

 login

line vty 5 15

 login

!

!

!

!

end
```

ASW2

MANS-ASW2#show running-config

Building configuration...

Current configuration : 4934 bytes

!

version 15.0

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname MANS-ASW2

!

enable secret 5 1mERr$hx5rVt7rPNoS4wqbXKX7m0

!

!

!

!

!

!

```
spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

 switchport access vlan 20

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/2

 switchport access vlan 20

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!
```

```
interface FastEthernet0/3

 switchport access vlan 20

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/4

 switchport access vlan 20

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/5

 switchport access vlan 30

 switchport mode access
```

```
  switchport port-security mac-address sticky

  switchport port-security violation restrict

  spanning-tree portfast

  spanning-tree guard root

  spanning-tree bpduguard enable

!
interface FastEthernet0/6

 switchport access vlan 30

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!
interface FastEthernet0/7

 switchport access vlan 30

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast
```

```
  spanning-tree guard root

  spanning-tree bpduguard enable

!

interface FastEthernet0/8

 switchport access vlan 30

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/9

 switchport access vlan 40

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!
```

```
interface FastEthernet0/10

 switchport access vlan 40

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/11

 switchport access vlan 40

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/12

 switchport access vlan 10

 switchport mode access
```

```
   switchport port-security mac-address sticky

   switchport port-security violation restrict

   spanning-tree portfast

   spanning-tree guard root

   spanning-tree bpduguard enable

!
interface FastEthernet0/13

  switchport access vlan 10

  switchport mode access

  switchport port-security mac-address sticky

  switchport port-security violation restrict

  spanning-tree portfast

  spanning-tree guard root

  spanning-tree bpduguard enable

!
interface FastEthernet0/14

  switchport access vlan 10

  switchport mode access

  switchport port-security mac-address sticky

  switchport port-security violation restrict

  spanning-tree portfast
```

```
 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/15

 switchport access vlan 10

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/16

 shutdown

!

interface FastEthernet0/17

 shutdown

!

interface FastEthernet0/18

 shutdown

!
```

```
interface FastEthernet0/19

 shutdown

!

interface FastEthernet0/20

 shutdown

!

interface FastEthernet0/21

 shutdown

!

interface FastEthernet0/22

 shutdown

!

interface FastEthernet0/23

 shutdown

!

interface FastEthernet0/24

 shutdown

!

interface GigabitEthernet0/1

 switchport mode trunk

 channel-protocol pagp
```

```
!
interface GigabitEthernet0/2
 switchport mode trunk
 channel-protocol pagp
!
interface Vlan1
 ip address 10.0.0.3 255.0.0.0
!
ip default-gateway 10.0.0.6
!
banner motd ^C
###################################################
    WELCOME TO MANS-ASW2
####################################################^C
!
!
!
line con 0
 password 7 0822455D0A16
 login
!
```

line vty 0

 password 7 0822455D0A16

 login

line vty 1 4

 login

line vty 5 15

 login

!

!

!

!

end

ASW3

MANS-ASW3#show running-config

Building configuration...

Current configuration : 4518 bytes

!

version 15.0

no service timestamps log datetime msec

no service timestamps debug datetime msec

```
service password-encryption
!
hostname MANS-ASW3
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport access vlan 40
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
```

```
 spanning-tree bpduguard enable
!
interface FastEthernet0/2
 switchport access vlan 40
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
 spanning-tree bpduguard enable
!
interface FastEthernet0/3
 switchport access vlan 40
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
 spanning-tree bpduguard enable
!
interface FastEthernet0/4
```

```
 switchport access vlan 40

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/5

 switchport access vlan 40

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/6

 switchport access vlan 40

 switchport mode access

 switchport port-security mac-address sticky
```

```
 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/7

 switchport access vlan 10

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/8

 switchport access vlan 10

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root
```

```
 spanning-tree bpduguard enable
!
interface FastEthernet0/9
 switchport access vlan 20
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
 spanning-tree bpduguard enable
!
interface FastEthernet0/10
 switchport access vlan 20
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
 spanning-tree bpduguard enable
!
interface FastEthernet0/11
```

```
  switchport access vlan 20

  switchport mode access

  switchport port-security mac-address sticky

  switchport port-security violation restrict

  spanning-tree portfast

  spanning-tree guard root

  spanning-tree bpduguard enable

!
 interface FastEthernet0/12

 switchport access vlan 20

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!
 interface FastEthernet0/13

 switchport access vlan 20

 switchport mode access

 switchport port-security mac-address sticky
```

```
 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/14

 shutdown

!

interface FastEthernet0/15

 shutdown

!

interface FastEthernet0/16

 shutdown

!

interface FastEthernet0/17

 shutdown

!

interface FastEthernet0/18

 shutdown

!

interface FastEthernet0/19
```

```
 shutdown
!
interface FastEthernet0/20
 shutdown
!
interface FastEthernet0/21
 shutdown
!
interface FastEthernet0/22
 shutdown
!
interface FastEthernet0/23
 shutdown
!
interface FastEthernet0/24
 shutdown
!
interface GigabitEthernet0/1
 switchport mode trunk
 channel-protocol pagp
!
```

```
interface GigabitEthernet0/2

 switchport mode trunk

 channel-protocol pagp

!

interface Vlan1

 ip address 10.0.0.4 255.0.0.0

 shutdown

!

ip default-gateway 10.0.0.6

!

banner motd ^C

####################################################

    WELCOME TO MANS-ASW3

####################################################^C

!

!

!

line con 0

 password 7 0822455D0A16

 login

!
```

line vty 0

 password 7 0822455D0A16

 login

line vty 1 4

 login

line vty 5 15

 login

!

!

!

!

end

ASW4

MANS-ASW4#show running-config

Building configuration...

Current configuration : 4342 bytes

!

version 15.0

no service timestamps log datetime msec

no service timestamps debug datetime msec

```
service password-encryption
!
hostname MANS-ASW4
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport access vlan 20
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
```

```
  spanning-tree bpduguard enable
!
interface FastEthernet0/2
 switchport access vlan 20
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
 spanning-tree bpduguard enable
!
interface FastEthernet0/3
 switchport access vlan 20
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
 spanning-tree bpduguard enable
!
interface FastEthernet0/4
```

```
    switchport access vlan 20

    switchport mode access

    switchport port-security mac-address sticky

    switchport port-security violation restrict

    spanning-tree portfast

    spanning-tree guard root

    spanning-tree bpduguard enable

!

interface FastEthernet0/5

 switchport access vlan 30

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/6

 switchport access vlan 30

 switchport mode access

 switchport port-security mac-address sticky
```

```
 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/7

 switchport access vlan 30

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/8

 switchport access vlan 30

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root
```

```
 spanning-tree bpduguard enable
!
interface FastEthernet0/9
 switchport access vlan 10
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
 spanning-tree bpduguard enable
!
interface FastEthernet0/10
 switchport access vlan 10
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security violation restrict
 spanning-tree portfast
 spanning-tree guard root
 spanning-tree bpduguard enable
!
interface FastEthernet0/11
```

```
 switchport access vlan 10

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/12

 switchport access vlan 10

 switchport mode access

 switchport port-security mac-address sticky

 switchport port-security violation restrict

 spanning-tree portfast

 spanning-tree guard root

 spanning-tree bpduguard enable

!

interface FastEthernet0/13

 shutdown

!

interface FastEthernet0/14
```

```
 shutdown
!
interface FastEthernet0/15
 shutdown
!
interface FastEthernet0/16
 shutdown
!
interface FastEthernet0/17
 shutdown
!
interface FastEthernet0/18
 shutdown
!
interface FastEthernet0/19
 shutdown
!
interface FastEthernet0/20
 shutdown
!
interface FastEthernet0/21
```

```
 shutdown
!
interface FastEthernet0/22
 shutdown
!
interface FastEthernet0/23
 shutdown
!
interface FastEthernet0/24
 shutdown
!
interface GigabitEthernet0/1
 switchport mode trunk
 channel-protocol pagp
!
interface GigabitEthernet0/2
 switchport trunk allowed vlan 10,20,30,40
 switchport mode trunk
 channel-protocol pagp
!
interface Vlan1
```

```
 ip address 10.0.0.5 255.0.0.0
!
ip default-gateway 10.0.0.6
!
banner motd ^C
###################################################
       WELCOME TO MANS-ASW4
###################################################
^C
!
!
!
line con 0
 password 7 0822455D0A16
 login
!
line vty 0
 password 7 0822455D0A16
 login
line vty 1 4
 login
```

```
line vty 5 15

 login

!

!

!

!

end
```

Distribution switches:

We used two distribution switches one as primary switch and other ad secondary switch and configured them with :

- Basic configuration
  - Hostname
  - Enable secret and VTY password (cisco)
  - Welcome Message
  - Encrypt all password

- Encrypt all password
- Enable InterVlan
- Enable Access-control-list

Primary DSW Configuration

MANS-DSW1#show running-config

```
!
hostname MANS-DSW1
!
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
!
no ip cef
ip routing
!
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree vlan 1,10,20,30,40 priority 24576
!
!
!
!
!
!
```

```
interface Port-channel1
!
interface GigabitEthernet1/0/1
no switchport
ip address 100.0.0.2 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet1/0/2
!
interface GigabitEthernet1/0/3
!
interface GigabitEthernet1/0/4
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
```

```
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
switchport trunk allowed vlan 10,20,30,40
switchport mode trunk
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/1/1
!
interface GigabitEthernet1/1/2
!
interface GigabitEthernet1/1/3
!
interface GigabitEthernet1/1/4
!
interface Vlan1
ip address 10.0.0.6 255.0.0.0
!
interface Vlan10
mac-address 0002.4a00.8601
ip address 192.168.1.2 255.255.255.0
ip helper-address 192.168.1.10
ip helper-address 192.168.5.10
ip helper-address 192.168.5.5
ip access-group 101 in
```

```
standby 10 ip 192.168.1.1
standby 10 priority 110
standby 10 preempt
!
interface Vlan20
mac-address 0002.4a00.8602
ip address 192.168.2.2 255.255.255.0
ip helper-address 192.168.1.10
ip helper-address 192.168.5.5
ip access-group 102 in
standby 20 ip 192.168.2.1
standby 20 priority 110
standby 20 preempt
!
interface Vlan30
mac-address 0002.4a00.8603
ip address 192.168.3.2 255.255.255.0
ip helper-address 192.168.1.10
ip helper-address 192.168.5.5
ip access-group 103 in
standby 30 ip 192.168.3.1
standby 30 priority 110
standby 30 preempt
!
interface Vlan40
mac-address 0002.4a00.8604
ip address 192.168.4.2 255.255.255.0
ip helper-address 192.168.1.10
ip helper-address 192.168.5.5
ip access-group 104 in
standby 40 ip 192.168.4.1
standby 40 priority 110
standby 40 preempt
!
router ospf 1
router-id 2.2.2.2
log-adjacency-changes
```

```
network 100.0.0.0 0.0.0.255 area 0
network 192.168.1.0 0.0.0.255 area 0
network 192.168.2.0 0.0.0.255 area 0
network 192.168.3.0 0.0.0.255 area 0
network 192.168.4.0 0.0.0.255 area 0
!
ip classless
!
ip flow-export version 9
!
!
access-list 102 permit udp any any eq bootps
access-list 102 permit udp any any eq bootpc
access-list 102 permit ip host 192.168.2.9 host 192.168.1.9
access-list 102 permit ip host 192.168.2.9 host 192.168.3.9
access-list 102 permit ip host 192.168.2.9 host 192.168.4.9
access-list 102 deny ip 192.168.2.0 0.0.0.255 192.168.1.0 0.0.0.255
access-list 102 deny ip 192.168.2.0 0.0.0.255 192.168.3.0 0.0.0.255
access-list 102 deny ip 192.168.2.0 0.0.0.255 192.168.4.0 0.0.0.255
access-list 102 permit ip any any
access-list 101 permit udp any any eq bootps
access-list 101 permit udp any any eq bootpc
access-list 101 permit ip host 192.168.1.9 host 192.168.2.9
access-list 101 permit ip host 192.168.1.9 host 192.168.3.9
access-list 101 permit ip host 192.168.1.9 host 192.168.4.9
access-list 101 deny ip 192.168.1.0 0.0.0.255 192.168.2.0 0.0.0.255
access-list 101 deny ip 192.168.1.0 0.0.0.255 192.168.3.0 0.0.0.255
access-list 101 deny ip 192.168.1.0 0.0.0.255 192.168.4.0 0.0.0.255
access-list 101 permit ip any any
access-list 103 permit udp any any eq bootps
access-list 103 permit udp any any eq bootpc
access-list 103 permit ip host 192.168.3.9 host 192.168.1.9
access-list 103 permit ip host 192.168.3.9 host 192.168.2.9
access-list 103 permit ip host 192.168.3.9 host 192.168.4.9
access-list 103 deny ip 192.168.3.0 0.0.0.255 192.168.1.0 0.0.0.255
access-list 103 deny ip 192.168.3.0 0.0.0.255 192.168.2.0 0.0.0.255
access-list 103 deny ip 192.168.3.0 0.0.0.255 192.168.4.0 0.0.0.255
```

```
access-list 103 permit ip any any
access-list 104 permit udp any any eq bootps
access-list 104 permit udp any any eq bootpc
access-list 104 permit ip host 192.168.2.9 host 192.168.1.9
access-list 104 permit ip host 192.168.2.9 host 192.168.3.9
access-list 104 permit ip host 192.168.2.9 host 192.168.2.9
access-list 104 deny ip 192.168.2.0 0.0.0.255 192.168.1.0 0.0.0.255
access-list 104 deny ip 192.168.2.0 0.0.0.255 192.168.3.0 0.0.0.255
access-list 104 deny ip 192.168.2.0 0.0.0.255 192.168.2.0 0.0.0.255
access-list 104 permit ip any any
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0
password cisco
login
line vty 1 4
login
!
!
!
ntp server 126.0.0.5
!
End
```

Standby DSW Configuration

```
BACKUP-SW#show running-config
Building configuration...

Current configuration : 5080 bytes
!
version 16.3.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname BACKUP-SW
!
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
!
no ip cef
ip routing
!
no ipv6 cef
!
!
!
!
!
!
!
!
```

```
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree vlan 1,10,20,30,40 priority 28672
!
!
!
!
!
!
interface Port-channel2
 switchport mode trunk
!
interface GigabitEthernet1/0/1
 no switchport
 ip address 200.0.0.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet1/0/2
 switchport mode trunk
!
interface GigabitEthernet1/0/3
 switchport mode trunk
!
interface GigabitEthernet1/0/4
 switchport mode trunk
!
interface GigabitEthernet1/0/5
 switchport mode trunk
!
```

```
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
 switchport mode trunk
!
interface GigabitEthernet1/0/22
 switchport mode trunk
```

```
!
interface GigabitEthernet1/0/23
 switchport mode trunk
!
interface GigabitEthernet1/0/24
 switchport mode trunk
!
interface GigabitEthernet1/1/1
!
interface GigabitEthernet1/1/2
!
interface GigabitEthernet1/1/3
!
interface GigabitEthernet1/1/4
!
interface Vlan1
 ip address 10.0.0.7 255.0.0.0
!
interface Vlan10
 mac-address 0060.2f0c.b901
 ip address 192.168.1.2 255.255.255.0
 ip helper-address 192.168.1.10
 ip helper-address 192.168.5.10
 ip helper-address 192.168.5.5
 ip access-group 101 in
 standby 10 ip 192.168.1.1
!
interface Vlan20
 mac-address 0060.2f0c.b902
 ip address 192.168.2.2 255.255.255.0
 ip helper-address 192.168.1.10
 ip helper-address 192.168.5.5
 ip access-group 102 in
 standby 20 ip 192.168.2.1
!
```

```
interface Vlan30
 mac-address 0060.2f0c.b903
 ip address 192.168.3.2 255.255.255.0
 ip helper-address 192.168.1.10
 ip helper-address 192.168.5.5
 ip access-group 103 in
 standby 30 ip 192.168.3.1
!
interface Vlan40
 mac-address 0060.2f0c.b904
 ip address 192.168.4.2 255.255.255.0
 ip helper-address 192.168.1.10
 ip helper-address 192.168.5.5
 ip access-group 104 in
 standby 40 ip 192.168.4.1
!
router ospf 1
 router-id 3.3.3.3
 log-adjacency-changes
 network 200.0.0.0 0.0.0.255 area 0
 network 192.168.1.0 0.0.0.255 area 0
 network 192.168.2.0 0.0.0.255 area 0
 network 192.168.3.0 0.0.0.255 area 0
 network 192.168.4.0 0.0.0.255 area 0
!
ip classless
!
ip flow-export version 9
!
!
access-list 102 permit udp any any eq bootps
access-list 102 permit udp any any eq bootpc
access-list 102 permit ip host 192.168.2.9 host 192.168.1.9
access-list 102 permit ip host 192.168.2.9 host 192.168.3.9
access-list 102 permit ip host 192.168.2.9 host 192.168.4.9
```

```
access-list 102 deny ip 192.168.2.0 0.0.0.255 192.168.1.0 0.0.0.255
access-list 102 deny ip 192.168.2.0 0.0.0.255 192.168.3.0 0.0.0.255
access-list 102 deny ip 192.168.2.0 0.0.0.255 192.168.4.0 0.0.0.255
access-list 102 permit ip any any
access-list 101 permit udp any any eq bootps
access-list 101 permit udp any any eq bootpc
access-list 101 permit ip host 192.168.1.9 host 192.168.2.9
access-list 101 permit ip host 192.168.1.9 host 192.168.3.9
access-list 101 permit ip host 192.168.1.9 host 192.168.4.9
access-list 101 deny ip 192.168.1.0 0.0.0.255 192.168.2.0 0.0.0.255
access-list 101 deny ip 192.168.1.0 0.0.0.255 192.168.3.0 0.0.0.255
access-list 101 deny ip 192.168.1.0 0.0.0.255 192.168.4.0 0.0.0.255
access-list 101 permit ip any any
access-list 103 permit udp any any eq bootps
access-list 103 permit udp any any eq bootpc
access-list 103 permit ip host 192.168.3.9 host 192.168.1.9
access-list 103 permit ip host 192.168.3.9 host 192.168.2.9
access-list 103 permit ip host 192.168.3.9 host 192.168.4.9
access-list 103 deny ip 192.168.3.0 0.0.0.255 192.168.1.0 0.0.0.255
access-list 103 deny ip 192.168.3.0 0.0.0.255 192.168.2.0 0.0.0.255
access-list 103 deny ip 192.168.3.0 0.0.0.255 192.168.4.0 0.0.0.255
access-list 103 permit ip any any
access-list 104 permit udp any any eq bootps
access-list 104 permit udp any any eq bootpc
access-list 104 permit ip host 192.168.2.9 host 192.168.1.9
access-list 104 permit ip host 192.168.2.9 host 192.168.3.9
access-list 104 permit ip host 192.168.2.9 host 192.168.2.9
access-list 104 deny ip 192.168.2.0 0.0.0.255 192.168.1.0 0.0.0.255
access-list 104 deny ip 192.168.2.0 0.0.0.255 192.168.3.0 0.0.0.255
access-list 104 deny ip 192.168.2.0 0.0.0.255 192.168.2.0 0.0.0.255
access-list 104 permit ip any any
!
banner motd ^C
####################################################
        MANS-BACKUP-SW
```

```
##################################################^C
!
!
!
!
line con 0
!
line aux 0
!
line vty 0
 password 7 0822455D0A16
 login
line vty 1 4
 login
!
!
!
ntp server 126.0.0.5
!
end
```

Router:

We used 2 Routers 1 for Mansoura branch and other for isp and we configured them with :

- Basic configuration (MANS-R)
  - Hostname
  - Enable secret and VTY password (cisco)
  - Welcome Message
  - Encrypt all password
- Static route
- Ip address for serial port

- Config OSPF area 0
- Config NAT at Mans-router
- Enable Remote Access at MANS-R

MANS-Router Configurations

MANS-R#show running-config
service password-encryption
!
hostname MANS-R
!
!
!
enable secret 5 1mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
username admin password 7 0822455D0A16
!
!
license udi pid CISCO2911/K9 sn FTX152401T1-
!
!
!
!
!
!
!

```
!
!
ip ssh version 1
ip domain-name cisco.com
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface GigabitEthernet0/0
ip address 200.0.0.1 255.255.255.0
ip nat inside
duplex auto
speed auto
!
interface GigabitEthernet0/1
ip address 100.0.0.1 255.255.255.0
ip nat inside
duplex auto
speed auto
!
interface GigabitEthernet0/2
no ip address
ip nat inside
duplex auto
speed auto
shutdown
!
interface Serial0/0/0
ip address 150.0.0.1 255.255.255.0
encapsulation ppp
ip nat outside
!
```

```
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface GigabitEthernet0/1/0
ip address 192.168.5.1 255.255.255.0
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
router-id 1.1.1.1
log-adjacency-changes
network 100.0.0.0 0.0.0.255 area 0
network 200.0.0.0 0.0.0.255 area 0
network 192.168.5.0 0.0.0.255 area 0
default-information originate
!
ip nat inside source list 1 interface Serial0/0/0 overload
ip classless
ip route 0.0.0.0 0.0.0.0 Serial0/0/0
!
ip flow-export version 9
!
!
access-list 1 permit any
!
banner motd ^C

####################################################

welcome to mans-r

#####################################################
^C
```

```
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
password 7 0822455D0A16
login local
transport input ssh
!
!
ntp server 126.0.0.5
!
End
```

ISP-Router Configuration

ISP-R#show running-config

Building configuration...

Current configuration : 921 bytes

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

```
!
hostname ISP-R
!
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1524BBX4-
!
!
!
!
```

```
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface GigabitEthernet0/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet0/1
```

```
 ip address 126.0.0.1 255.0.0.0

 duplex auto

 speed auto

!

interface GigabitEthernet0/2

 no ip address

 duplex auto

 speed auto

 shutdown

!

interface Serial0/0/0

 ip address 150.0.0.2 255.255.255.0

 encapsulation ppp

 clock rate 2000000

!

interface Serial0/0/1

 no ip address

 clock rate 2000000

 shutdown

!

interface Vlan1
```

```
  no ip address

 shutdown

!

router eigrp 1

 network 0.0.0.0

!

ip classless

!

ip flow-export version 9

!

!

!

!

!

!

!

line con 0

!

line aux 0

!

line vty 0 4
```

login

!

!

ntp server 126.0.0.5

!

end
Services

We used a switch connect with it 4 servers

Public DNS server >> 126.0.0.2

NTP Server >>126.0.0.5

Facebook Server >> 126.0.0.3

Google Server >> 126.0.0.4

DHCP Server>> ip 192.168.5.5/24

>>Gateway 192.168.5.1