

**Test Note – IP Office Configured in a VLAN  
environment. Cisco and Dell Switches configured for  
802.1p/q**

**PLEASE NOTE THE FOLLOWING CONFIGURATIONS/EXAMPLES HAVE BEEN PROVIDED AS REFERENCE MATERIAL ONLY, THESE CONFIGURATIONS HAVE BEEN TAKEN FROM A REAL INSTALLATION, WHERE THE LAN ENVIROMENT HAS BEEN CONFIGURED TO SUPPORT BOTH VOICE AND DATA USING 802.1P/Q TO SUPPORT AVAYA IP PHONES AND PROVIDE COS.**

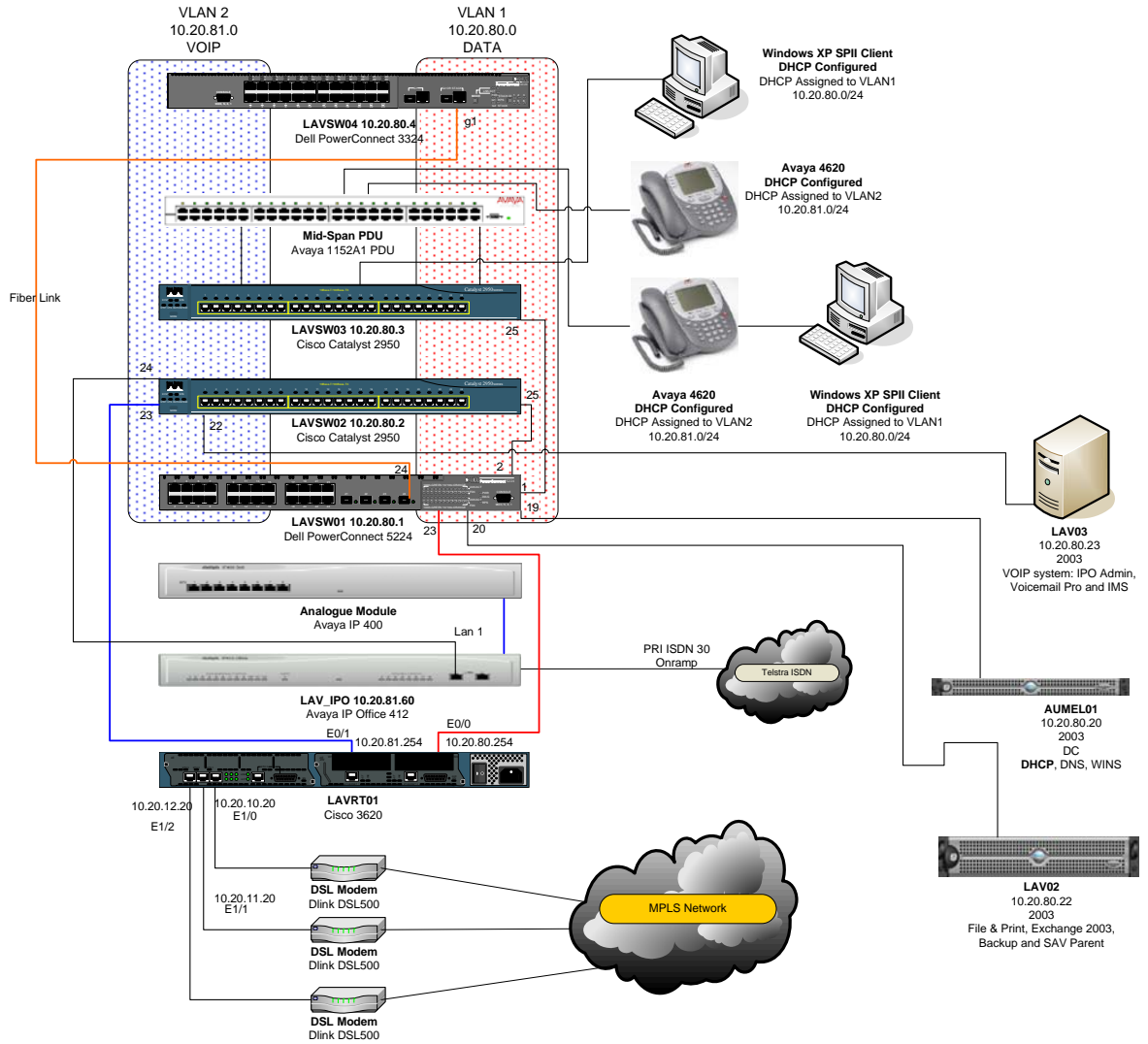
**THE NETWORK ABOVE CONSITS OF CISCO AND DELL ETHERNET SWITCHES CONFIGUED FOR VLAN SUPPORT AND VLAN TRUNKING, A CISCO 3620 IS PERFORMING THE WAN ROUTING AND ROUTING BETWEEN THE 10.20.80.0 AND 10.20.81.0 NETWORKS.**

**IN THIS EXAMPLE THE DHCP SERVER HAS BEEN CONFIGURED TO SUPPORT BOTH 10.20.80.0 AND 10.0.20.81.0 VLAN SCOPES. ASIGNING THE IP PHONES TO VLAN 2 WHEN THE IP PHONES ARE BOOTED AND PROVIDING THEM WITH THE CORRECT CALL AND FILESERVER INFORMATION.**

**THIS SITE USES A COMBANATION OF 85 AVAYA 4620'S AND 4602 AVAYA IP HANDSETS CONNECTED TO AN AVAYA IP0 412. THIS SITE IS CURRENTLY RUNNING 2.1(31) FIRMWARE.**

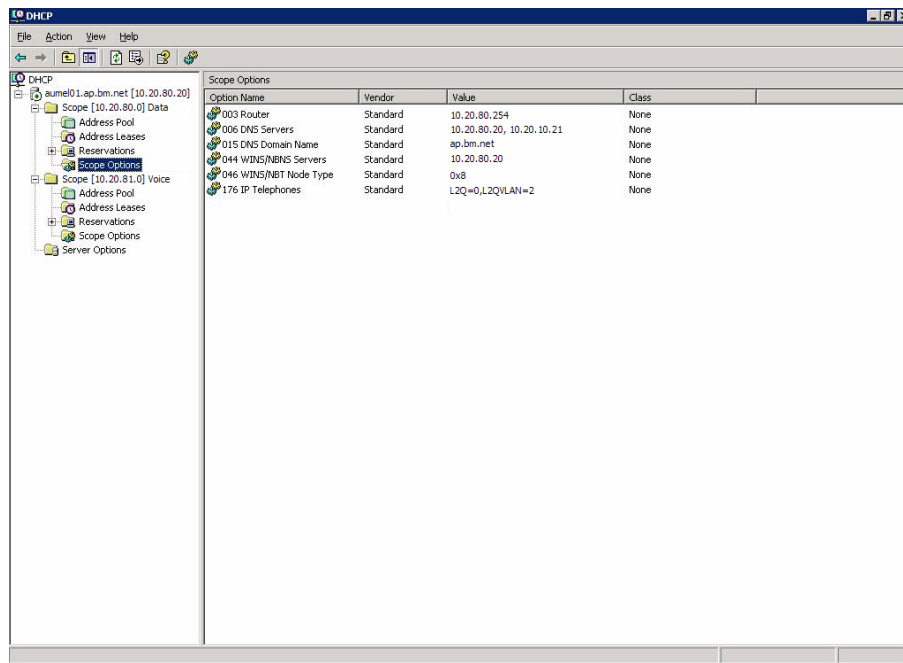
**YOU MAY WISH TO POSITION THE IP OFFICE IN THE DATA VLAN TO ENABLE EBLF UPDATES FROM PHONE MANAGER AND SOFTCONSOLE TO FUNCTION WITHOUT ADDITIONAL CONFIGURATION ON THE ROUTER TO ENABLE THE EBLF TRAFFIC TO PASS BETWEEN VLANS.**

### Network diagram

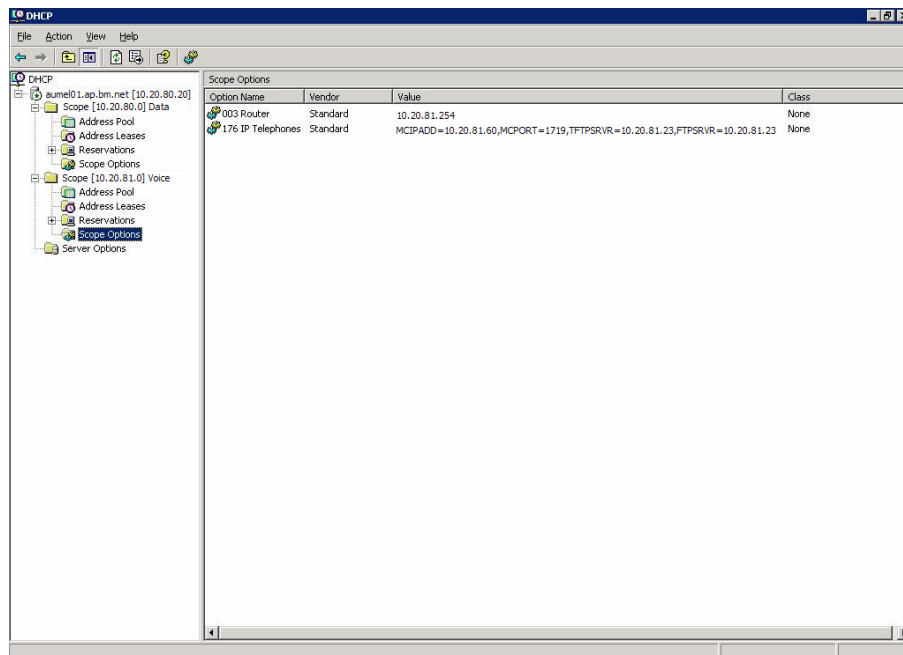


## DHCP Server Scopes configured on AUMEL01 10.20.80.20

### 10.20.80.0 Network Data Scope, Option 176 settings



### 10.20.81.0 Network Voice Scope, Option 176 settings



In concept when IP Phones boot they attach to native VLAN1 the phone pulls the option 176 from the 10.20.80.0 network scope which informs the phone via the L2QVLAN=2 to reboot into VLAN2 the phone then reboots in VLAN2 and receives an IP address in the 10.20.81.0 network and receives option 176 settings for call server address (IPO), call setup port (1719), file server address (Manager or other TFTP server), ftp server (For backing up Phone Settings to FTP server).

For further information on DHCP scope option please refer to the AVAYA LAN administrators guide downloadable from [www.avaya.com](http://www.avaya.com)

### **46XXSettings File**

Only entry below to disables IR Port on 4620's

### **SET IRSTAT 0**

### **Core Cisco 3620 LAVRT01 Configuration**

```
version 12.2
no service pad
service timestamps debug uptime
service timestamps log uptime
service password-encryption
!
hostname lavrt01
!
enable secret 5 WITHHELD
!
username admin password 7 WITHHELD
clock timezone EST 10
clock summer-time EDT recurring last Sun Oct 2:00 last Sun Mar 3:00
ip subnet-zero
!
ip name-server 10.20.10.30
ip name-server 10.20.10.21
!
call rsvp-sync
!
interface Loopback0
ip address 10.20.254.20 255.255.255.255
!
interface BRI0/0
no ip address
encapsulation hdlc
shutdown
!
interface Ethernet0/0
ip address 10.20.80.254 255.255.255.0
full-duplex
!
interface Serial0/0
no ip address
shutdown
!
interface Ethernet0/1
ip address 10.20.81.254 255.255.255.0
ip helper-address 10.20.20.20
full-duplex
!
interface Ethernet1/0
ip address 10.20.10.20 255.255.255.0
load-interval 30
half-duplex
!
interface Ethernet1/1
ip address 10.20.11.20 255.255.255.0
```

```
load-interval 30
half-duplex
!
interface Ethernet1/2
ip address 10.20.12.20 255.255.255.0
load-interval 30
half-duplex
!
interface Ethernet1/3
no ip address
shutdown
half-duplex
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.20.10.10
ip route 0.0.0.0 0.0.0.0 10.20.11.10
ip route 10.20.10.60 255.255.255.255 10.20.12.10
ip route 10.20.30.60 255.255.255.255 10.20.12.30
ip http server
!
snmp-server community WITHHELD
snmp-server location WITHHELD
snmp-server contact WITHHELD
snmp-server enable traps tty
!
dial-peer cor custom
!
line con 0
exec-timeout 120 0
stopbits 1
line aux 0
line vty 0 4
exec-timeout 120 0
password WITHHELD
login local
!
scheduler max-task-time 5000
end
```

### 10.20.80.1 Dell Power Connect 5224 Configuration LAVSW01

```
hostname Lavswitch01
snmp-server location Server Room
snmp-server contact James Lane
!
!
snmp-server community private rw
snmp-server community public ro
!
username admin access-level 15
username admin password 7 WITHHELD
username guest access-level 0
username guest password 7 WITHHELD
enable password level 15 7 WITHHELD
!
vlan database
vlan 1 name DefaultVlan media ethernet state active
vlan 2 name voice media ethernet state active
!
interface ethernet 1/1
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport mode trunk
switchport allowed vlan add 1-2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/2
switchport allowed vlan add 1 untagged
switchport native vlan 1
```

```
switchport mode trunk
switchport allowed vlan add 1-2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/3
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/4
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/5
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/6
switchport allowed vlan add 2 untagged
switchport native vlan 2
switchport allowed vlan remove 1
switchport forbidden vlan add 1
queue cos-map 3 5 6 7
!
interface ethernet 1/7
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/8
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/9
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/10
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/11
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/12
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/13
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/14
```

```
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/15
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/16
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/17
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/18
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/19
switchport allowed vlan add 1 untagged
switchport native vlan 1
queue cos-map 3 5 6 7
!
interface ethernet 1/20
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/21
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/22
switchport allowed vlan add 1-2 untagged
switchport native vlan 1
queue cos-map 3 5 6 7
!
interface ethernet 1/23
speed-duplex 10full
no negotiation
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport allowed vlan add 2 tagged
queue cos-map 3 5 6 7
!
interface ethernet 1/24
switchport allowed vlan add 1 untagged
switchport native vlan 1
switchport mode trunk
switchport allowed vlan add 1-2 tagged
queue cos-map 3 5 6 7
!
interface vlan 1
ip address 10.20.80.1 255.255.255.0
ip default-gateway 10.20.80.254
spanning-tree hello-time 1
line console
line vty
```

end  
!

**10.20.80.2 Cisco Catalyst 2950 LAVSW02**

```
version 12.1
no service pad
service timestamps debug uptime
service timestamps log uptime
service password-encryption
!
hostname lavsw02
!
wrr-queue bandwidth 20 1 80 0
wrr-queue cos-map 1 0 1 2 4
wrr-queue cos-map 3 3 6 7
wrr-queue cos-map 4 5
mls qos map cos-dscp 0 8 16 26 32 46 48 56
ip subnet-zero
!
spanning-tree mode pvst
spanning-tree portfast default
no spanning-tree optimize bpdu transmission
spanning-tree extend system-id
!
interface FastEthernet0/1
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/2
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/3
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/4
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/5
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/6
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/7
switchport trunk allowed vlan 1,2
```

```
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/8
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/9
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/10
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/11
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/12
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/13
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/14
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/15
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/16
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
```

```
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/17
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/18
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/19
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/20
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/21
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/22
description VOIP Voice Server (lav03)
switchport access vlan 2
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/23
description VLAN 2 Router Gateway
switchport access vlan 2
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/24
description VOIP Server (IPO)
switchport access vlan 2
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface GigabitEthernet0/1
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
!
interface GigabitEthernet0/2
no cdp enable
```

```
!  
interface Vlan1  
ip address 10.20.80.2 255.255.255.0  
no ip route-cache  
!  
interface Vlan2  
no ip address  
no ip route-cache  
shutdown  
!  
ip default-gateway 10.20.80.254  
ip http server  
!  
no cdp run  
!  
line con 0  
line vty 0 4  
password 7 WITHHELD  
login  
line vty 5 15  
password 7 WITHHELD  
login  
!  
end
```

### 10.20.80.3 Cisco Catalyst 2950 LAVSW03

```
version 12.1  
no service pad  
service timestamps debug uptime  
service timestamps log uptime  
service password-encryption  
!  
hostname lavsw03  
!  
wrr-queue bandwidth 20 1 80 0  
wrr-queue cos-map 1 0 1 2 4  
wrr-queue cos-map 3 3 6 7  
wrr-queue cos-map 4 5  
mls qos map cos-dscp 0 8 16 26 32 46 48 56  
ip subnet-zero  
!  
spanning-tree mode pvst  
spanning-tree portfast default  
no spanning-tree optimize bpdu transmission  
spanning-tree extend system-id  
!  
interface FastEthernet0/1  
switchport trunk allowed vlan 1,2  
switchport mode trunk  
mls qos trust cos  
auto qos voip trust  
no cdp enable  
spanning-tree portfast  
!  
interface FastEthernet0/2  
switchport trunk allowed vlan 1,2  
switchport mode trunk  
mls qos trust cos  
auto qos voip trust  
no cdp enable  
spanning-tree portfast  
!  
interface FastEthernet0/3  
switchport trunk allowed vlan 1,2  
switchport mode trunk  
mls qos trust cos  
auto qos voip trust  
no cdp enable  
spanning-tree portfast  
!  
interface FastEthernet0/4  
switchport trunk allowed vlan 1,2
```

```
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/5
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/6
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/7
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/8
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/9
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/10
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/11
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/12
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/13
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
```

```
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/14
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/15
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/16
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/17
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/18
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/19
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/20
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/21
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/22
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
```

```
interface FastEthernet0/23
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface FastEthernet0/24
switchport trunk allowed vlan 1,2
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
spanning-tree portfast
!
interface GigabitEthernet0/1
switchport mode trunk
mls qos trust cos
auto qos voip trust
no cdp enable
!
interface GigabitEthernet0/2
no cdp enable
!
interface Vlan1
ip address 10.20.80.3 255.255.255.0
no ip route-cache
!
interface Vlan2
no ip address
no ip route-cache
shutdown
!
ip default-gateway 10.20.80.254
ip http server
!
no cdp run
!
line con 0
exec-timeout 0 0
line vty 0 4
password 7 WITHELD
login
line vty 5 15
password 7 WITHELD
login
!
end
```

### 10.20.80.4 Dell Power Connect 3324 Configuration LAVSW04

```
spanning-tree mode rstp
spanning-tree forward-time 5
interface range ethernet 1/e(1-24)
switchport mode general
exit
interface ethernet 1/g1
switchport mode trunk
exit
vlan database
vlan 2
exit
interface ethernet 1/e1
switchport general allowed vlan add 2
exit
interface ethernet 1/g1
switchport trunk allowed vlan add 2
exit
interface vlan 2
name Voice
exit
interface range ethernet 1/e(1-24)
switchport general ingress-filtering disable
exit
interface vlan 1
ip address 10.20.80.4 255.255.255.0
exit
ip default-gateway 10.20.80.254
wrr-queue cos-map 3 3
wrr-queue cos-map 4 5
qos trust dscp
priority-queue out num-of-queues 2
hostname lavsw04

aaa authentication enable default line

aaa authentication login default line

line telnet
login authentication default
enable authentication default
exit
line ssh
login authentication default
enable authentication default
exit
line console
login authentication default
enable authentication default
exit

snmp-server location WITHHELD
snmp-server contact WITHHELD
```

Further information regarding Cisco configurations please refer to

<http://www.cisco.com>

Further information regarding Dell power edge configurations please refer to

<http://www.dell.com>