D-Link Switch Training

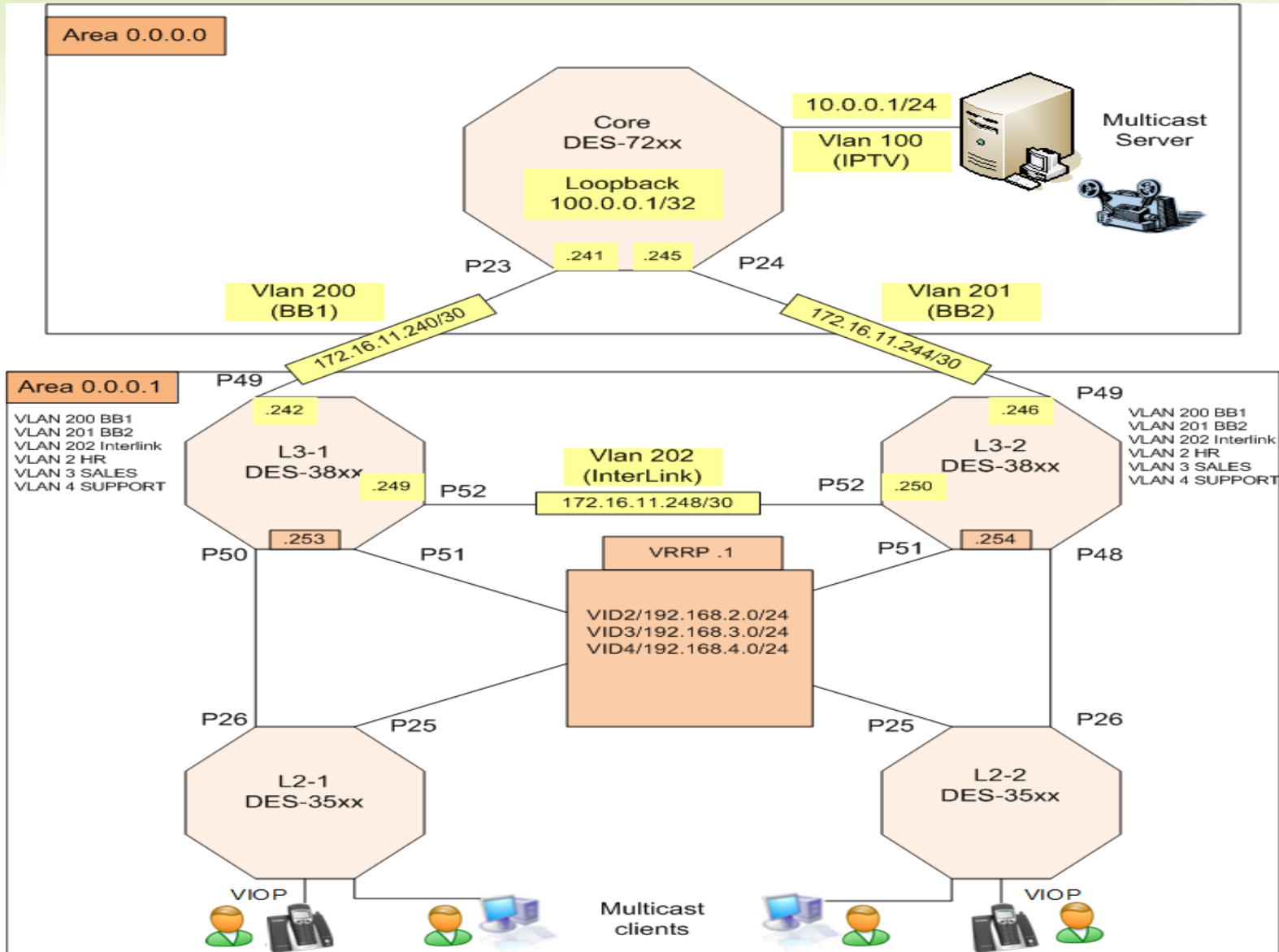Tony Thomas
D-Link Middle East

Building Triple Play Network Environment

- **Voice, Video, Data**

- **Key trend in the network market.**

Simply requirements of the project :

- Voice, Video and Data are all provided in a single access subscription.

- Using Multicast traffic to provide TV channels to end user.

- Need Redundancy Mechanism in the topology design

Network Topology

Prime protocols for the hands on

- **MSTP**

- **OSPF**

- **VRRP**

- **IGMP**

- **PIM DM / SM**

Basic Configurations
DES – 7206 Layer 3 Chassis Switch

Configuring IP address for Vlan 1 (Default Vlan)
DES-7206>en
DES-7206#config t
DES-7206(config)#interface vlan 1
DES-7206(config)#no switch port
DES-7206(config-if)# ip address x.x.x.x x.x.x.x
DES-7206(config-if)#exit

Configuring IP address for LoopBack
DES-7206#config t
DES-7206(config)#interface loopback 0
DES-7206(config)#no switch port
DES-7206(config-if)# ip address 100.0.0.1 255.255.255.255
DES-7206(config-if)#exit

Creating Vlans
DES-7206#config t
DES-7206(config)#vlan 200
DES-7206(config-vlan)#name BB1
DES-7206(config-vlan)#exit

```
DES-7206#config t
DES-7206(config)#vlan 201
DES-7206(config-vlan)#name BB2
DES-7206(config-vlan)#exit

DES-7206#config t
DES-7206(config)#vlan 100
DES-7206(config-vlan)#name IPTV
DES-7206(config-vlan)#exit
```

Assigning IP address to the created vlans
```
DES-7206#config  t
DES-7206(config)#interface vlan 200
DES-7206(config-if)# ip address 172.16.11.241 255.255.255.252
DES-7206(config-if)#exit

DES-7206#config  t
DES-7206(config)#interface vlan 201
DES-7206(config-if)# ip address 172.16.11.245 255.255.255.252
DES-7206(config-if)#exit
```

```
DES-7206#config  t
DES-7206(config)#interface vlan 100
DES-7206(config-if)# ip address 10.0.0.1 255.255.255.0
DES-7206(config-if)#exit
```

Configuring uplink ports
```
DES-7206#config  t
DES-7206(config)#interface gigabitEthernet 2/23
DES-7206(config-if)#switchport mode access
DES-7206(config-if)#switchport access vlan 200
DES-7206(config-if)#no shut
DES-7206(config-if)#exit

DES-7206#config  t
DES-7206(config)#interface gigabitEthernet 2/24
DES-7206(config-if)#switchport mode access
DES-7206(config-if)# switchport access vlan 201
DES-7206(config-if)#no shut
DES-7206(config-if)#exit

DES-7206#config  t
DES-7206(config)#interface gigabitEthernet 2/1
DES-7206(config-if)#switchport mode access
DES-7206(config-if)#switchport access vlan 100
DES-7206(config-if)#no shut
DES-7206(config-if)#exit
```

 # Switch Prompt

config command_prompt L3-1

Assigning IP address for the switch

 # mgmt ip

config ipif System ipaddress x.x.x.x/xx

Creating vlans and tagging the vlan id

 # VLAN

create vlan BB1 tag 200

create vlan Interlink tag 202

create vlan HR tag 2

create vlan SALES tag 3

create vlan SUPPORT tag 4

Assigning IP address for the switch and all the vlans

 # IPIF

create ipif BB1 172.16.11.242/30 BB1

create ipif Interlink 172.16.11.249/30 Interlink

create ipif HR 192.168.2.253/24 HR

create ipif SALES 192.168.3.253/24 SALES

create ipif SUPPORT 192.168.4.253/24 SUPPORT

Tagging the vlans to the ports

 # VLAN Port connection

config vlan default delete 1-52

config vlan BB1 add untagged 49

config vlan Interlink add untagged 52

config vlan HR add tagged 50,51,52

config vlan SALES add tagged 50,51,52

config vlan SUPPORT add tagged 50,51,52

 # Switch Prompt

config command_prompt L3-2

Creating vlans and tagging the vlan id

 # VLAN

create vlan BB2 tag 201

create vlan Interlink tag 202

create vlan HR tag 2

create vlan SALES tag 3

create vlan SUPPORT tag 4

Assigning IP address for the switch and all the vlans

 # IPIF

create ipif BB2 172.16.11.246/30 BB2

create ipif Interlink 172.16.11.250/30 Interlink

create ipif HR 192.168.2.254/24 HR

create ipif SALES 192.168.3.254/24 SALES

create ipif SUPPORT 192.168.4.254/24 SUPPORT

Tagging the vlans to the ports
 # VLAN Port connection
config vlan default delete 1-52
config vlan BB2 add untagged 49
config vlan Interlink add untagged 52
config vlan HR add tagged 48,51,52
config vlan SALES add tagged 48,51,52
config vlan SUPPORT add tagged 48,51,52

\# Switch Prompt

config command_prompt L2

Creating vlans and tagging the vlan id

 # VLAN

create vlan HR tag 2

create vlan SALES tag 3

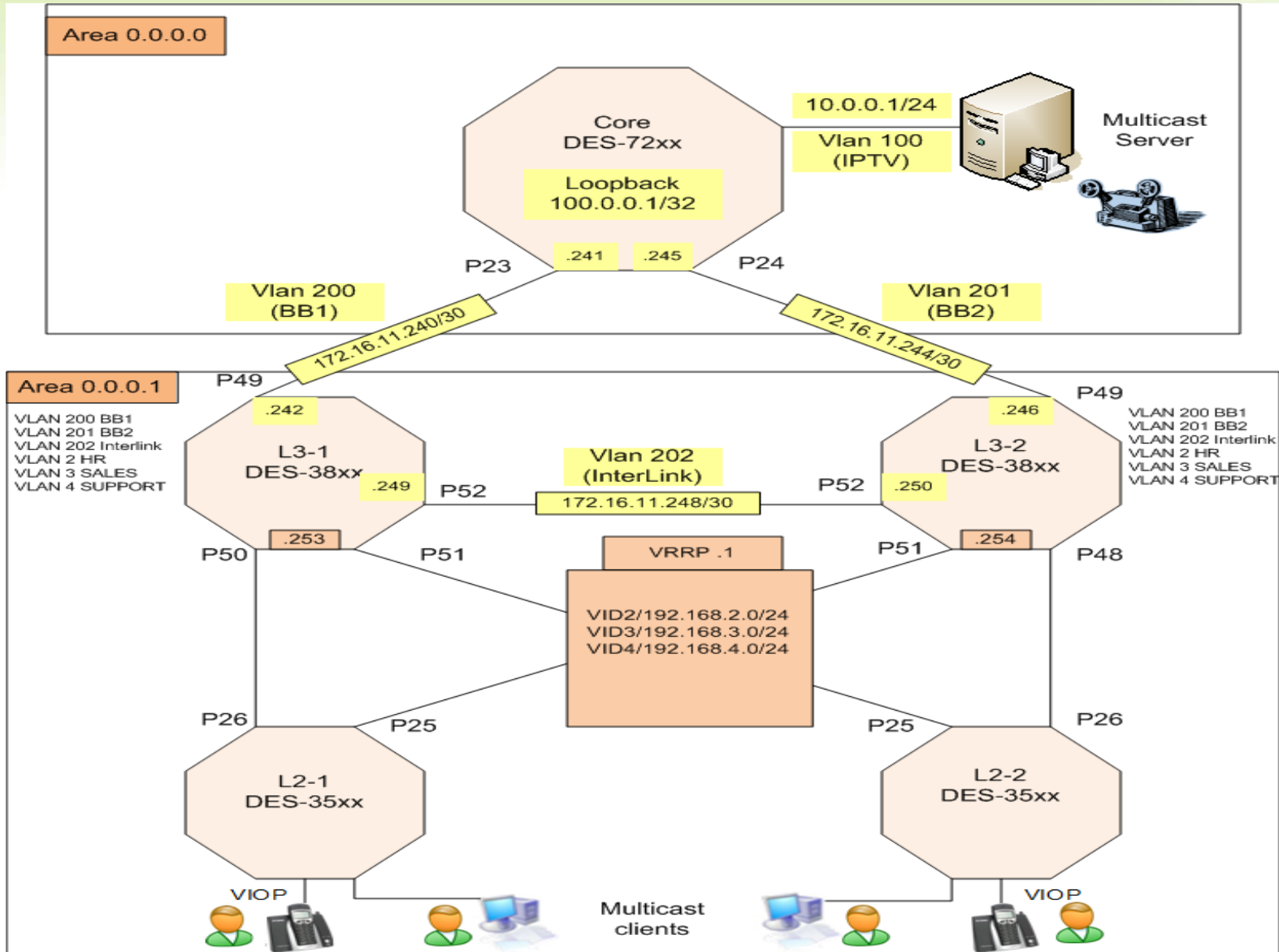create vlan SUPPORT tag 4

Tagging the vlans to the ports

 # VLAN Port connection

config vlan HR add tagged 25,26

config vlan SALES add tagged 25,26

config vlan SUPPORT add tagged 25,26

config vlan default delete 1-26

config vlan HR add untagged 1-6

config vlan SALES add untagged 7-12

config vlan SUPPORT add untagged 13-18

\# Switch Prompt

config command_prompt L2

Creating vlans and tagging the vlan id

 # VLAN

create vlan HR tag 2

create vlan SALES tag 3

create vlan SUPPORT tag 4

Tagging the vlans to the ports

\# VLAN Port connection

config vlan HR add tagged 25,26

config vlan SALES add tagged 25,26

config vlan SUPPORT add tagged 25,26

config vlan default delete 1-26

config vlan HR add untagged 1-6

config vlan SALES add untagged 7-12

config vlan SUPPORT add untagged 13-18

MSTP
(Multiple Spanning Tree Protocol)

Network Topology

Configuring MSTP and creating instances for the vlans

 # MSTP

config stp version mstp

config stp mst_config_id name dlink revision_level 1

create stp instance_id 1

config stp instance_id 1 add_vlan 2

config stp priority 8192 instance_id 1

create stp instance_id 2

config stp instance_id 2 add_vlan 3

config stp priority 8192 instance_id 2

create stp instance_id 3

config stp instance_id 3 add_vlan 4

config stp priority 8192 instance_id 3

enable stp

Configuring MSTP and creating instances for the vlans

 # MSTP
config stp version mstp
config stp mst_config_id name dlink revision_level 1

create stp instance_id 1
config stp instance_id 1 add_vlan 2
config stp priority 32768 instance_id 1

create stp instance_id 2
config stp instance_id 2 add_vlan 3
config stp priority 32768 instance_id 2

create stp instance_id 3
config stp instance_id 3 add_vlan 4
config stp priority 32768 instance_id 3
enable stp

Configuring MSTP and creating instances for the vlans

 # MSTP

config stp version mstp

config stp mst_config_id name dlink revision_level 1

create stp instance_id 1

create stp instance_id 2

create stp instance_id 3

config stp instance_id 1 add_vlan 2

config stp instance_id 2 add_vlan 3

config stp instance_id 3 add_vlan 4

config stp ports 1-24 edge true

enable stp

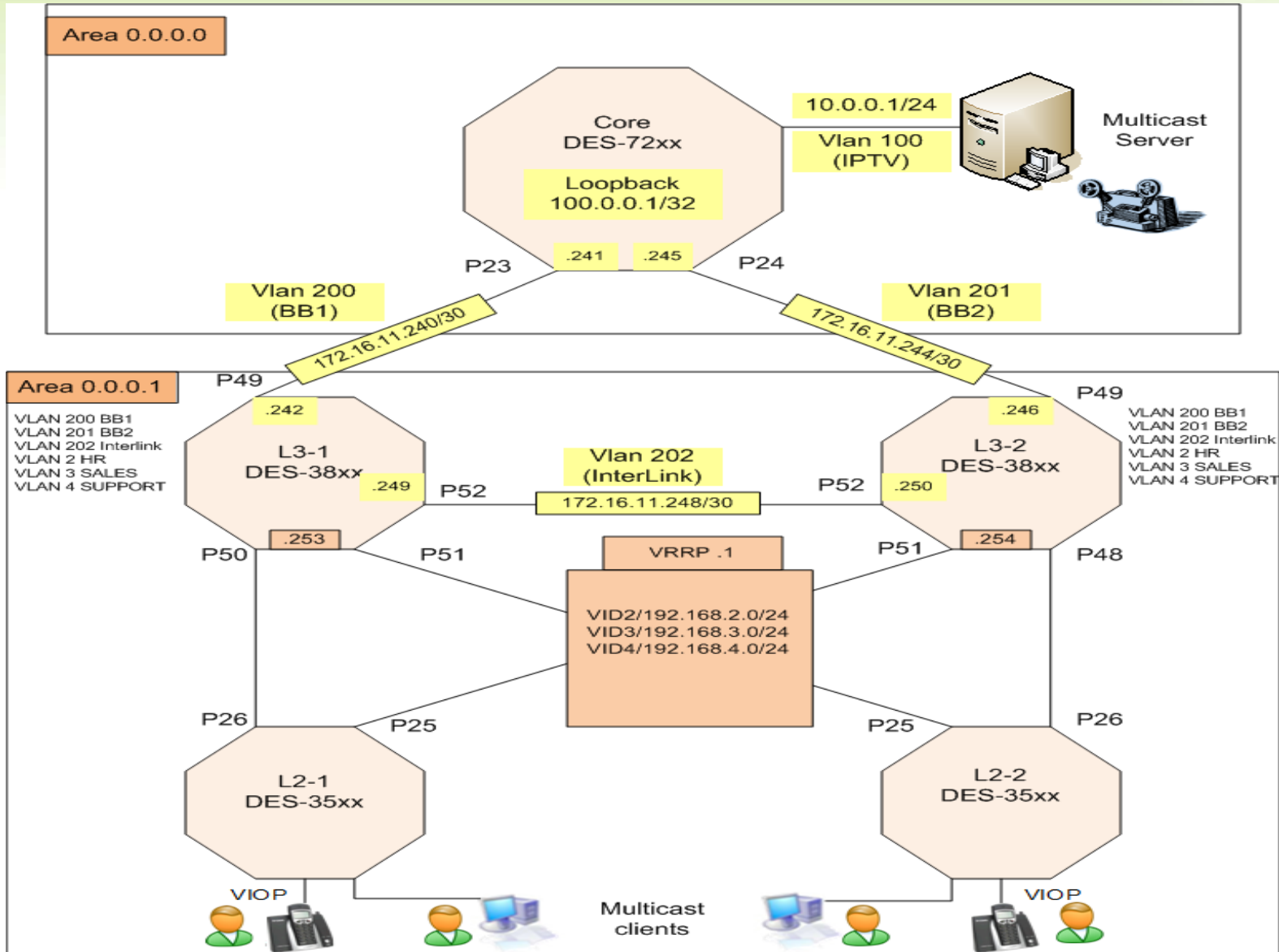**Configuring MSTP and creating instances for the vlans**

 # MSTP

config stp version mstp

config stp mst_config_id name dlink revision_level 1

create stp instance_id 1

create stp instance_id 2

create stp instance_id 3

config stp instance_id 1 add_vlan 2

config stp instance_id 2 add_vlan 3

config stp instance_id 3 add_vlan 4

config stp ports 1-24 edge true

enable stp

OSPF
(Open Shortest Path First)

Network Topology

OSPF Configurations
DES-7206 Chassis Switch

Confguring OSPF

DES-7206#config t
DES-7206(config)#router ospf 1
DES-7206(config-router)#router-id 3.3.3.3
DES-7206(config-router)# network 10.0.0.0 0.0.0.255 area 0.0.0.0
DES-7206(config-router)# network 100.0.0.1 0.0.0.0 area 0.0.0.0
DES-7206(config-router)# network 172.16.11.240 0.0.0.3 area 0.0.0.0
DES-7206(config-router)# network 172.16.11.244 0.0.0.3 area 0.0.0.0
DES-7206(config-router)#exit
DES-7206(config) #exit

Configuring router id and creating and assigning areas to the vlans

 # OSPF

enable ospf

config ospf router_id 1.1.1.1

create ospf area 0.0.0.1 type normal

config ospf ipif BB1area 0.0.0.0 state enable

config ospf ipif Interlink area 0.0.0.0 state enable

config ospf ipif HR area 0.0.0.1 state enable

config ospf ipif SALES area 0.0.0.1 state enable

config ospf ipif SUPPORT area 0.0.0.1 state enable

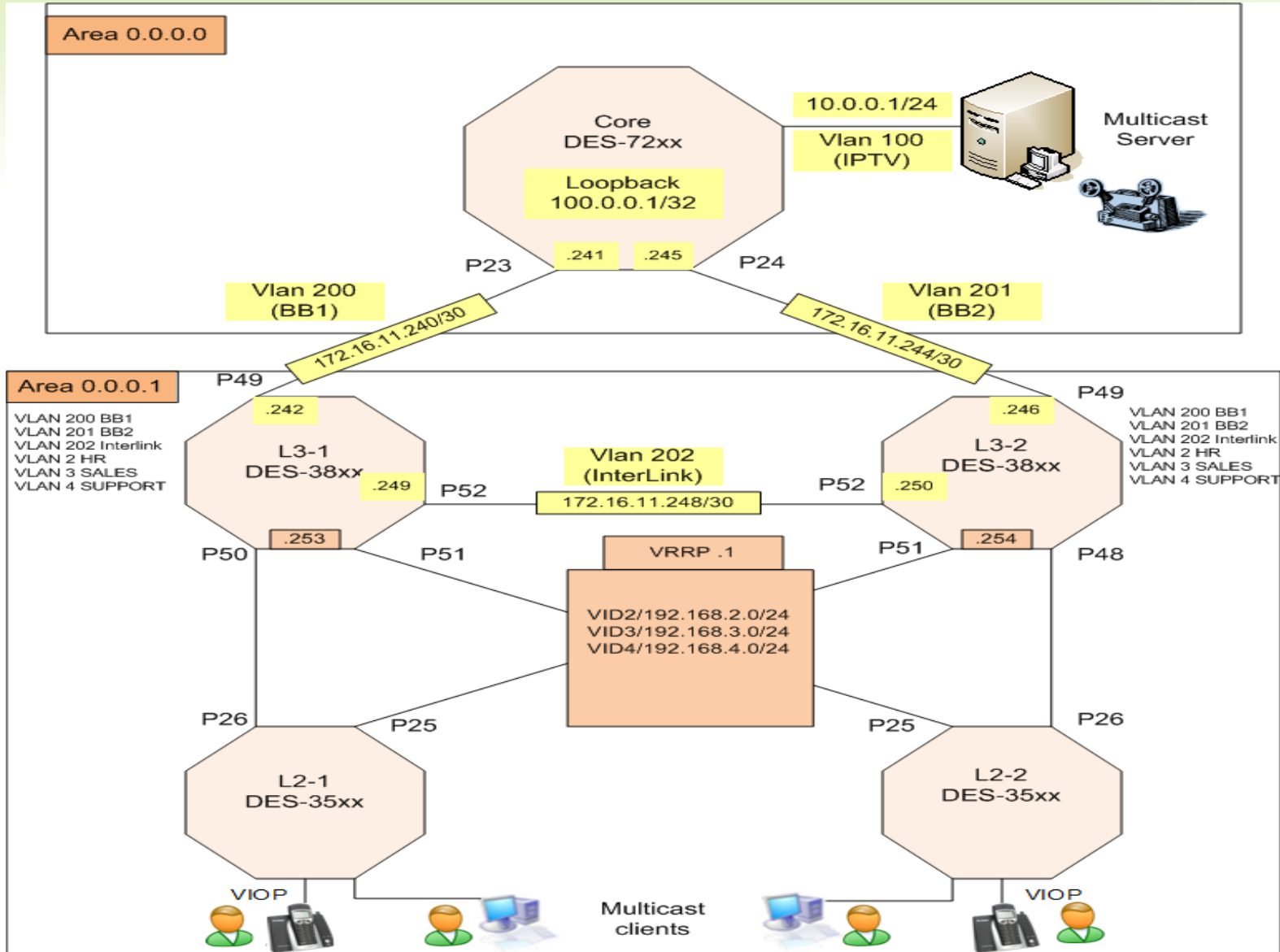**Configuring router id and creating and assigning areas to the vlans**

 # OSPF
enable ospf
config ospf router_id 2.2.2.2
create ospf area 0.0.0.1 type normal
config ospf ipif BB2 area 0.0.0.0 state enable
config ospf ipif Interlink area 0.0.0.0 state enable
config ospf ipif HR area 0.0.0.1 state enable
config ospf ipif SALES area 0.0.0.1 state enable
config ospf ipif SUPPORT area 0.0.0.1 state enable

VRRP
(Virtual Router Redundant Protocol)

Network Topology

Creating VRRP ipaddress to all the vlans

 # VRRP

enable vrrp

enable vrrp ping

create vrrp vrid 2 ipif HR ipaddress 192.168.2.1priority 150 state enable preempt true

create vrrp vrid 3 ipif SALES ipaddress 192.168.3.1 priority 150 state enable preempt true

create vrrp vrid 4 ipif SUPPORT ipaddress 192.168.4.1 priority 150 state enable preempt true

VRRP Configurations
DES-3852 L3-2 Distribution Switch

Creating VRRP ipaddress to all the vlans

 # VRRP

enable vrrp

enable vrrp ping

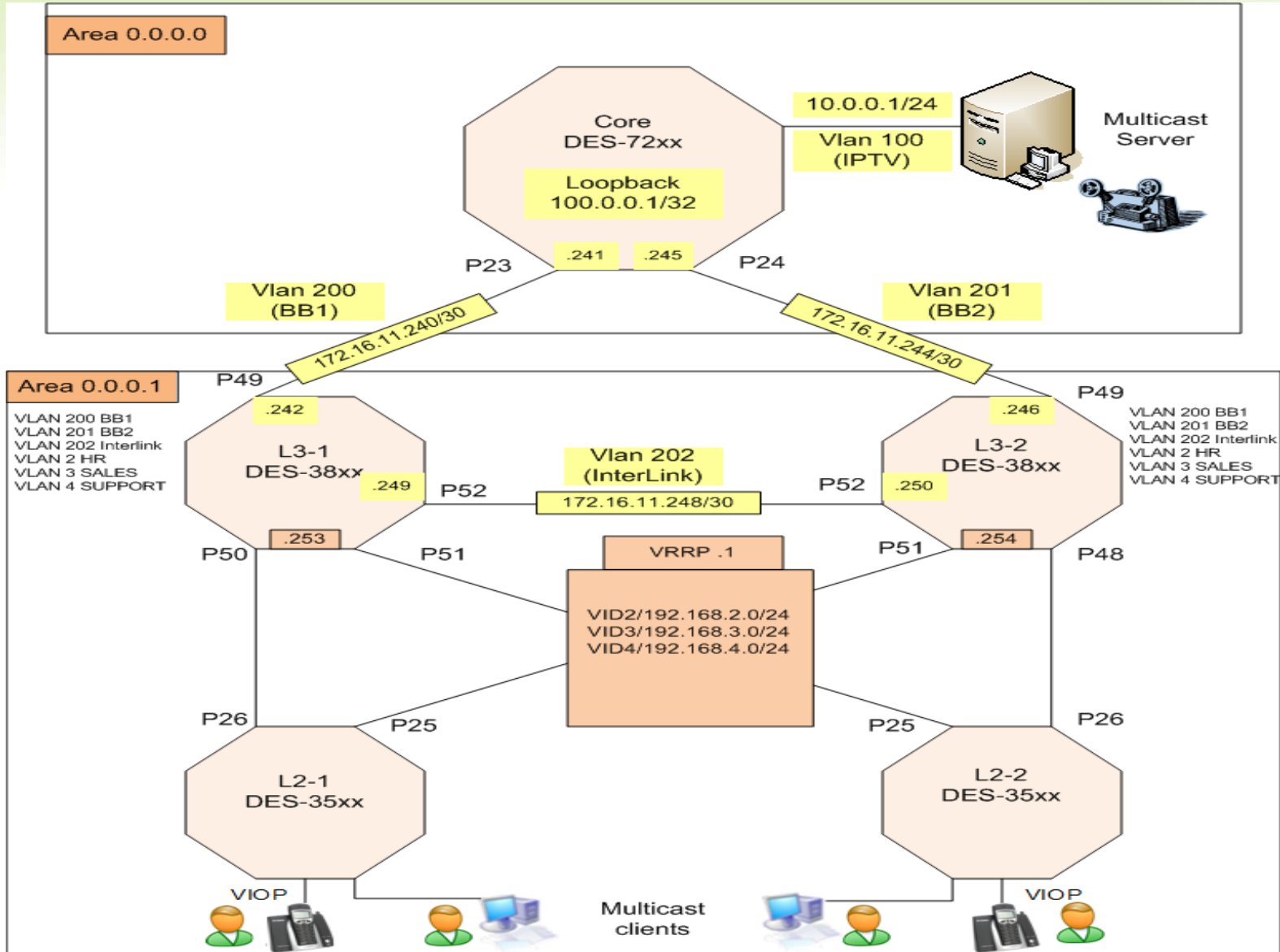create vrrp vrid 2 ipif HR ipaddress 192.168.2.1priority 100 state enable preempt false

create vrrp vrid 3 ipif SALES ipaddress 192.168.3.1 priority 100 state enable preempt false

create vrrp vrid 4 ipif SUPPORT ipaddress 192.168.4.1 priority 100 state enable preempt false

IGMP
(Internet Group Management Protocol)

Network Topology

IGMP Configurations
DES-7206 Chassis Switch

Multicasting
Configuring IGMP and PIM for multicasting

```
DES-7206#config  t
DES-7206(config)#ip multicast-routing
DES-7206(config)#interface vlan 200
DES-7206(config-if)#ip pim sparse mode
DES-7206(config-if)#ip ip igmp version 3
DES-7206(config-if)#ip igmp query-interval 20

DES-7206(config)#interface vlan 201
DES-7206(config-if)#ip pim sparse mode
DES-7206(config-if)#ip ip igmp version 3
DES-7206(config-if)#ip igmp query-interval 20

DES-7206(config)#interface vlan 100
DES-7206(config-if)#ip pim sparse mode
DES-7206(config-if)#ip ip igmp version 3
DES-7206(config-if)#ip igmp query-interval 20

DES-7206(config)#interface loopback 0
DES-7206(config-if)#ip pim sparse mode
DES-7206(config-if)#ip ip igmp version 3
DES-7206(config-if)#ip igmp query-interval 20
```

Configuring IGMP to all vlans

 # IGMP

config igmp ipif BB1version 3 query_interval 20 state enable

config igmp ipif Interlink version 3 query_interval 20 state enable

config igmp ipif HR version 3 query_interval 20 state enable

config igmp ipif SALES version 3 query_interval 20 state enable

config igmp ipif SUPPORT version 3 query_interval 20 state enable

Configuring IGMP to all vlans

 # IGMP

config igmp ipif BB2 version 3 query_interval 20 state enable

config igmp ipif Interlink version 3 query_interval 20 state enable

config igmp ipif HR version 3 query_interval 20 state enable

config igmp ipif SALES version 3 query_interval 20 state enable

config igmp ipif SUPPORT version 3 query_interval 20 state enable

Configuring IGMP Snooping

 # IGMP_Snooping

config multicast filtering_mode all filter_unregistered_groups

config igmp_snooping all state enable

enable igmp_snooping

IGMP Configurations
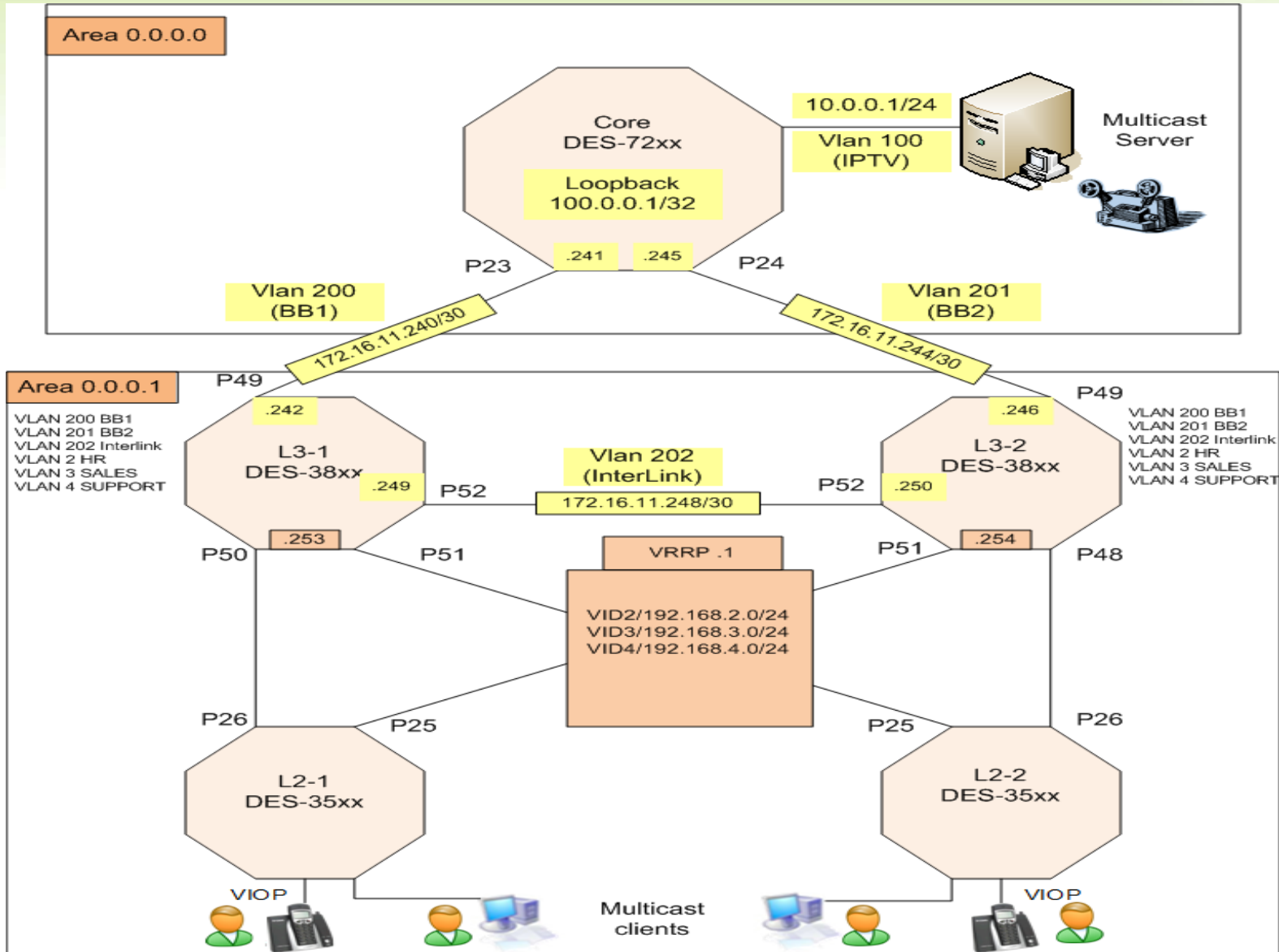# DES-3526 L2-2 Access Switch

Configuring IGMP Snooping

 # IGMP_Snooping
config multicast filtering_mode all filter_unregistered_groups
config igmp_snooping all state enable
enable igmp_snooping

PIM DM/SM
(Protocol Independent Multicast
Dense Mode / Sparse Mode)

Network Topology

PIM Configurations
DES-3852 L3-1 Distribution Switch

Configuring PIM to all vlans

 # PIM

enable pim

config pim ipif BB1 mode sm dr_priority 100 state enable

config pim ipif Interlink mode sm dr_priority 100 state enable

config pim ipif HR mode sm dr_priority 100 state enable

config pim ipif SALES mode sm dr_priority 100 state enable

config pim ipif SUPPORT mode sm dr_priority 100 state enable

Configuring PIM to all vlans

 # PIM

enable pim

config pim ipif BB2 mode sm dr_priority 50 state enable

config pim ipif Interlink mode sm dr_priority 50 state enable

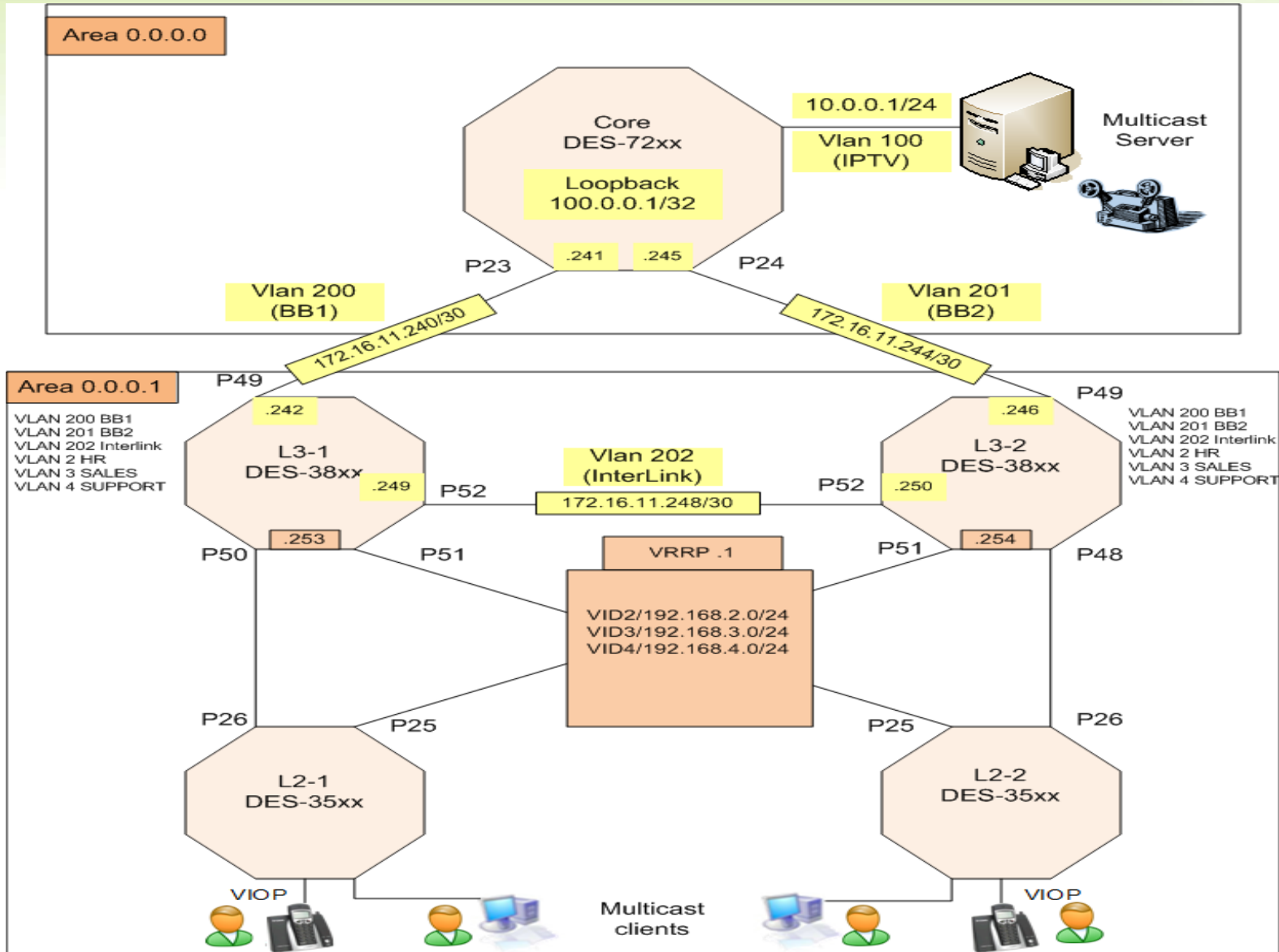config pim ipif HR mode sm dr_priority 50 state enable

config pim ipif SALES mode sm dr_priority 50 state enable

config pim ipif SUPPORT mode sm dr_priority 50 state enable

Rendezvous Points

Network Topology

Configuring Rendevous Point (RP) for PIM

DES-7206#config t
DES-7206(config)#ip pim rp-address 100.0.0.1
DES-7206(config)#exit

Rendezvouz Point Configurations
DES-3852 L3-1/L3-2 Distribution Switch

Configuring Rendevous Point (RP) for PIM

#create pim static_rp group 224.0.0.0/4 rp 100.0.0.1

Q & A