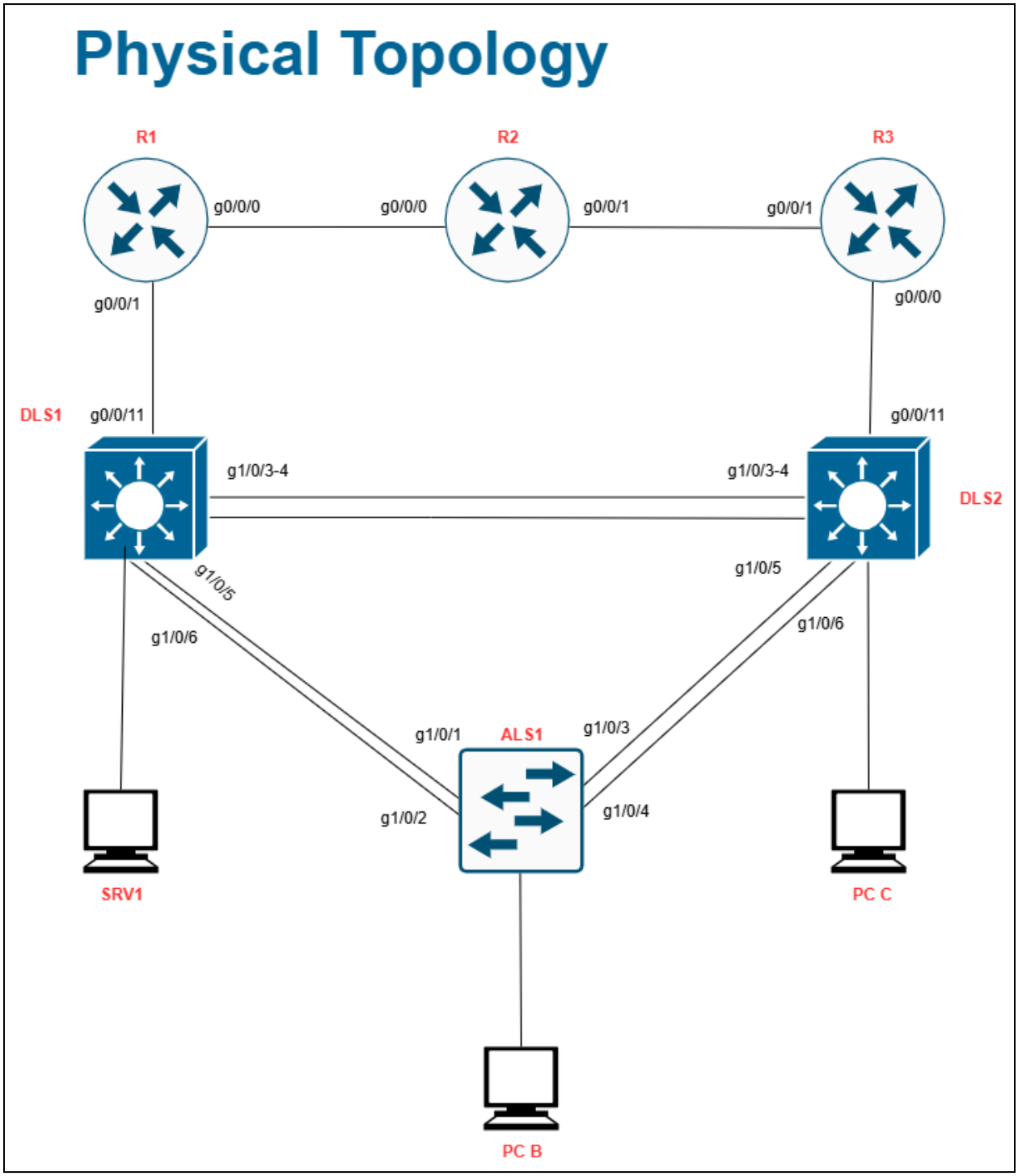
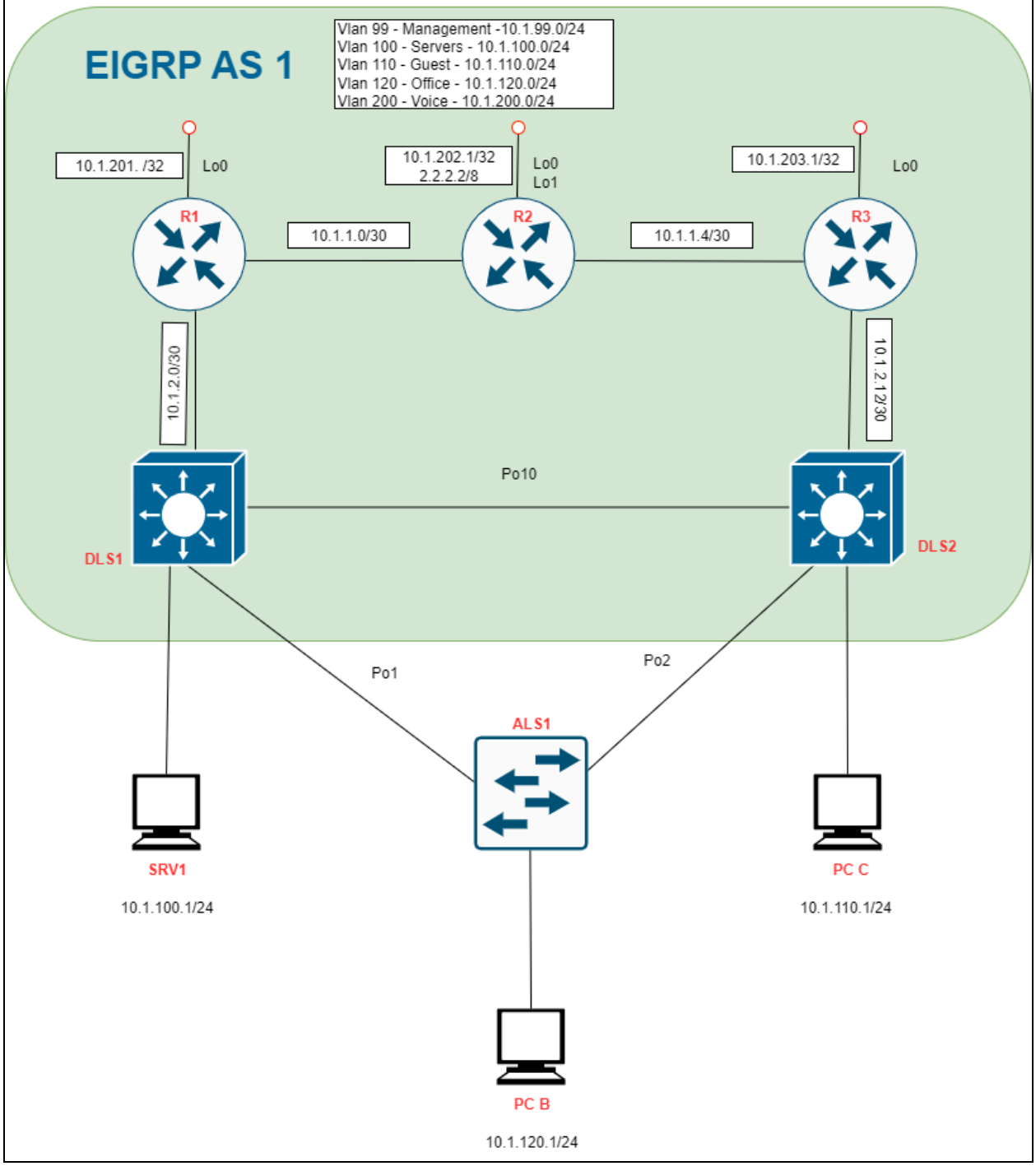
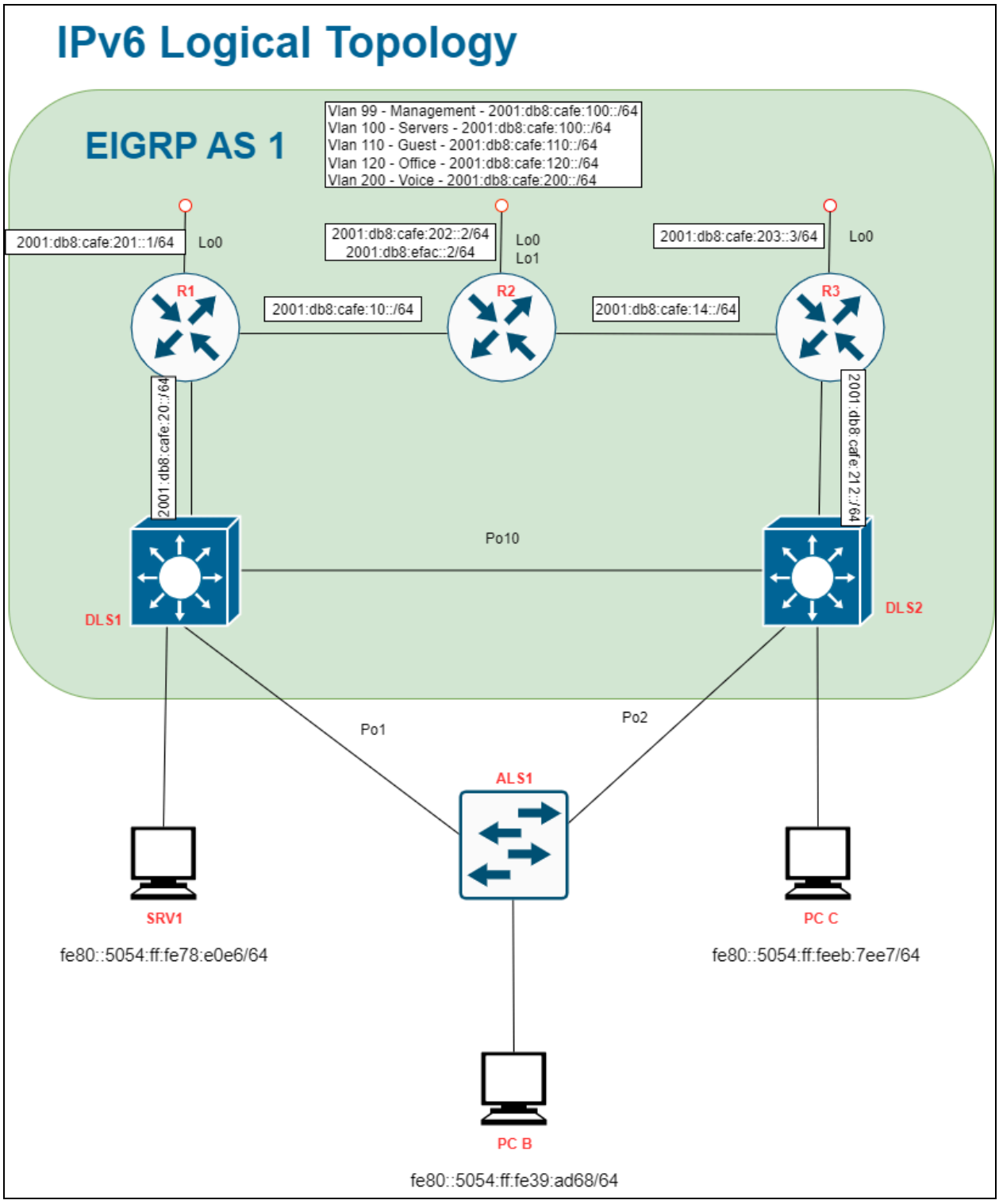
.Aysha Bilai: 100916114
Sidrah Hashmi: 100915053



# IPv4 Logical Topology




IPv6 Logical Topology
EIGRP AS 1
Vlan 99 - Management - 2001:db8:cafe:100::/64
Vlan 100 - Servers - 2001:db8:cafe:100::/64
Vlan 110 - Guest - 2001:db8:cafe:110::/64
Vlan 120 - Office - 2001:db8:cafe:120::/64
Vlan 200 - Voice - 2001:db8:cafe:200::/64
2001:db8:cafe:201::1/64
Lo0
2001:db8:cafe:202::2/64
2001:db8:efac::2/64
Lo0
Lo1
2001:db8:cafe:203::3/64
Lo0
R1
R2
R3
2001:db8:cafe:10::/64
2001:db8:cafe:14::/64
2001:db8:cafe:20::/64
2001:db8:cafe:212::/64
Po10
DLS1
DLS2
Po1
Po2
ALS1
SRV1
fe80::5054:ff:fe78:e0e6/64
PC C
fe80::5054:ff:feeb:7ee7/64
PC B
fe80::5054:ff:fe39:ad68/64

| DEVICE | INTERFACE | IPv4-ADDRESS | IPv6-ADDRESS |
|---|---|---|---|
| R1 (fe80::1) | g0/0/0 | 10.1.1.1 /30 | 2001:DB8:CAFE:10::1 /64 |
| | g0/0/1 | 10.1.2.2 /30 | 2001:DB8:CAFE:20::1 /64 |
| | g0 | 10.41.30.116 | — |
| | Lo0 | 10.1.201.1/32 | 2001:db8:cafe:201::1/64 |
| R2 (fe80::2) | g0/0/0 | 10.1.1.2 /30 | 2001:db8:cafe:10::2/64 |
| | g0/0/1 | 10.1.1.6 /30 | 2001:db8:cafe:14::2/64 |
| | g0 | 10.41.30.117 | 2001:db8:cafe:202::2/64 |
| | Lo0 | 10.1.202.1 /32 | 2001:db8:cafe:202::2/64 |
| | Lo1 | 2.2.2.2 /8 | 2001:db8:efac::2/64 |
| R3 (fe80::3) | g0/0/0 | 10.1.1.5 /30 | 2001:db8:cafe:14::3/64 |
| | g0/0/1 | 10.1.2.14 /30 | 2001:db8:cafe:212::3/64 |
| | g0 | 10.41.30.118 | — |
| | Lo0 | 10.1.203.1 /32 | 2001:db8:cafe:203::3/64 |
| DLS1 (fe80::d1) | Vlan99 (MANAGEMENT) | 10.1.99.252 /24 | 2001:db8:cafe:99::d1/64 |
| | Vlan100 (SERVERS) | 10.1.100.252 /24 | 2001:db8:cafe:100::d1/64 |
| | Vlan110 (GUEST) | 10.1.110.252 /24 | 2001:db8:cafe:110::d1/64 |
| | Vlan120 (OFFICE) | 10.1.120.252 /24 | 2001:db8:cafe:110::d1/64 |
| | Vlan200 (VOICE) | 10.1.200.252 /24 | 2001:db8:cafe:200::d1/64 |

| | | | |
|---|---|---|---|
| | g0/0/1 | 10.1.2.1 /30 | 2001:db8:cafe:20::d1/64 |
| | Port-channel1 | — | — |
| | Port-channel 10 | — | — |
| DLS2 (fe80::d2) | Vlan99 (MANAGEMENT) | 10.1.99.253 /24 | 2001:db8:cafe:99::d2/64 |
| | Vlan100 (SERVERS) | 10.1.100.253 /24 | 2001:db8:cafe:100:d2/64 |
| | Vlan110 (GUEST) | 10.1.110.253 /24 | 2001:db8:cafe:110:d2/64 |
| | Vlan120 (OFFICE) | 10.1.120.253 /24 | 2001:db8:cafe:120:d2/64 |
| | Vlan200 (VOICE) | 10.1.200.253 /24 | 2001:db8:cafe:200:d2/64 |
| | g0/0 | 10.41.30.121 | — |
| | g1/0/11 | 10.1.2.13 /30 | 2001:db8:cafe:212:d2/64 |
| | Port-channel2 | — | — |
| | Port-channel10 | — | — |
| ALS1 (fe80::a1) | Vlan99 (MANAGEMENT) | 10.1.99.251 /24 | 2001:db8:cafe:99::a1/64 |
| | Vlan110 (GUEST) | 10.1.110.251 /24 | 2001:db8:cafe:110::a1/64 |
| | Vlan120 (OFFICE) | 10.1.120.251 /24 | 2001:db8:cafe:120::a1/64 |
| | Vlan200 (VOICE) | 10.1.200.251 /24 | 2001:db8:cafe:200:a1/64 |
| | g0/0 | 10.41.30.122 | — |
| SRV1 | | 10.1.100.1/24 | fe80::5054:ff:fe78:e0e6/64 |
| PC-B | | 10.1.120.1/24 | fe80::5054:ff:fe39:ad68/64 |
| PC-C | | 10.1.110.1/24 | fe80::5054:ff:feeb:7e |

| | | | |
|---|---|---|---|
| | | | e7/64 |

## VLANs

DLS1:
Vlan 100(servers): g/0/23

DLS2:
Vlan 110 (guest): g1/0/23

ALS1:
Vlan 120 (office) : g1/0/23
Vlan 200 (voice): g1/0/23

## VTP:

→ Domain name: TSHOOT

| Switch | VTP version | Operating mode | # of VLANs | Revision number | Configured by (IP & VLAN) |
|---|---|---|---|---|---|
| DLS1 | 1 | Transparent | 12 | 0 | 10.1.100.251 (VLAN 10) |
| DLS2 | 1 | Transparent | 12 | 0 | 10.1.110.253 (VLAN 110) |
| ALS1 | 1 | Transparent | 11 | 0 | 10.1.120.251 (VLAN 120) |

## STP

**Commands: show int trunk**

| Switch | Trunk Ports | Encapsulation | Native VLAN | VLANs Allowed on Trunk | VLANs Allowed & Active in Mgmt Domain | VLANs in Stp Forwarding (Not pruned) |
|---|---|---|---|---|---|---|
| **DLS1** | Po1, Po10 | 802.1q | 666 | Po1: 99, 100, 120, 200 | Po1: 99, 100, 120, 200 | Po1: 99, 100, 120, 200 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Po10: 99–100, 110, 120, 200 | Po10: 99–100, 110, 120, 200 | Po10: 99–100, 110, 120, 200 |
| **DLS2** | Po2, Po10 | 802.1q | 666 | Po2: 99, 100, 120, 200<br>Po10: 99–100, 110, 120, 200 | Po2: 99, 100, 120, 200<br>Po10: 99–100, 110, 120, 200 | Po2: 99, 100, 120, 200<br>Po10: 99–100, 110, 120, 200 |
| **ALS1** | Po1, Po2 | 802.1q | 666 | Po1: 99, 100, 120, 200<br>Po2: 99, 110, 120, 200 | Po1: 99, 100, 120, 200<br>Po2: 99, 110, 120, 200 | Po1: 99, 110, 120<br>Po2: 200 |

**Commands: show spanning-tree**

→ DLS1 is the root bridge for VLANs 1, 99, 110, 120

→ DLS2 is the root bridge for VLANs 100, 200

| **Switch** | **VLAN** | **Root bridge** | **Bridge priority** | **Role** | **Int & states** |
|---|---|---|---|---|---|
| DLS1 | 1 | DLS1 | 32769 | Root | Ap1/0/1 → designated, forwarding |
| | 99 | DLS1 | 24675 | root | Po1 → designated, FWD; Po10 → Designated, FWD |
| | 100 | DLS2 | 28772 | Secondary | g1/0/23 → designated, FWD;Po10 → root port (to DLS2) |
| | 110 | DLS1 | 24686 | Root | Po1 (Designated, FWD),<br>Po10 (Designated, FWD) |
| | 120 | DLS1 | 24696 | Root | Po1 (Designated, FWD), |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | Po10 (Designated, FWD |
| | 200 | DLS2 | 28872 | Secondary | Po1 (Designated, FWD),<br>Po10 (Root Port) |
| DLS2 | 1 | DLS2 | 32769 | Root | Ap1/0/1 (Designated, FWD) |
| | 99 | DLS1 | 28771 | Secondary | Po2 (Designated, FWD),<br>Po10 (Root Port → DLS1) |
| | 100 | DLS2 | 24676 | Root | Po10 (Designated, FWD) |
| | 110 | DLS1 | 28782 | Secondary | g1/0/23 (Designated, FWD),<br>Po2 (Designated, FWD),<br>Po10 (Root Port) |
| | 120 | DLS2 | 28792 | Root | Po2 (Designated, FWD),<br>Po10 (Root Port) |
| | 200 | DLS2 | 24776 | Root | Po2 (Designated, FWD), Po10 (Designated, FWD) |
| ALS1 | 99 | DLS1 | 32867 | Secondary | Po1 (Root Port → DLS1), Po2 (Alternate, Blocked) |
| | 110 | DLS1 | 32878 | Secondary | Po1 (Root Port → DLS1), Po2 (Alternate, Blocked) |
| | 120 | DLS1 | 32888 | Secondary | Po1 (Alternate, Blocked), Po2 (Root Port → DLS1) |
| | 200 | DLS2 | 32968 | Secondary | Po1 (Alternate, Blocked), Po2 (Root Port → DLS2) |

## Etherchannel

**Commands: show etherchannel summary**

DLS1:
Number of channel-groups in use: 2
Number of aggregators: 2

| Group | Port-channel | Ports | |
|---|---|---|---|
| 1 | Po1 (SU) | g1/0/5(P) | g1/0/6(P) |
| 10 | Po10 (SU) | g1/0/3(P) | g1/0/4(P) |

P → bundled in port-channel

DLS2:
Number of channel-groups in use: 2
Number of aggregators: 2

| Group | Port-channel | Ports | |
|---|---|---|---|
| 2 | Po2 (SU) | g1/0/5(P) | g1/0/6(P) |
| 10 | Po10 (SU) | g1/0/3(P) | g1/0/4(P) |

P → bundled in port-channel

ALS1:
Number of channel-groups in use: 2
Number of aggregators: 2

| Group | Port-channel | Ports | |
|---|---|---|---|
| 1 | Po1 (SU) | g1/0/1(P) | g1/0/2(P) |
| 2 | Po2 (SU) | g1/0/3(P) | g1/0/4(P) |

P → bundled in port-channel

## HSRP

**Command: show standby br**

DLS1:

| INT | PRIORITY | STATE | STANDBY | VIRTUAL IP |
|---|---|---|---|---|
| Vlan 99 | 110 | Active | 10.1.99.253 | 10.1.99.254 |

| | | | | |
|---|---|---|---|---|
| Vlan 100 | 100 | Standby | Local | 10.1.100.254 |
| Vlan 110 | 110 | Active | 10.1.110.253 | 10.1.110.254 |
| Vlan 120 | 110 | Active | 10.1.120.253 | 10.1.120.254 |
| Vlan 200 | 100 | Standby | Local | 10.1.200.254 |

DLS2:

| INT | PRIORITY | STATE | STANDBY | VIRTUAL IP |
|---|---|---|---|---|
| Vlan 99 | 110 | Active | 10.1.99.253 | 10.1.99.254 |
| Vlan 100 | 100 | Standby | Local | 10.1.100.254 |
| Vlan 110 | 110 | Standby | 10.1.110.252 | 10.1.110.254 |
| Vlan 120 | 100 | Standby | Local | 10.1.120.254 |
| Vlan 200 | 110 | Active | Local | 10.1.200.254 |

## CDP neighbors

**Commands: show cdp neighbors**

→ all three routers connect to a management switch for out-of-bound management
→ each router also connects to a distribution switch (DLS1 or DLS2)
→ DLS1/2 are distribution layer switches. They are directly connected to each other.
→ every switch connects upwards to R1 and R3
→ every switch connects downwards to ALS1

| Device | Neighbor | Local Interface | Neighbor Port ID | Capabilities |
|---|---|---|---|---|
| R1 | R2 | g0/0/0 | g0/0/0 | R, S, I |
| | DLS1 | g0/0/1 | g1/0/11 | R, S, I |
| | MGMT3 | g0 | g1/0/18 | S, I |
| R2 | R3 | g0/0/1 | g0/0/0 | R, S, I |
| | R1 | g0/0/0 | g0/0/0 | R, S, I |
| | MGMT3 | g0 | g1/0/24 | S, I |

| | | | | |
|---|---|---|---|---|
| R3 | R2 | g0/0/0 | g0/0/1 | R, S, I |
| | DLS2 | g0/0/1 | g1/0/11 | R, S, I |
| | MGMT3 | g0 | g1/0/17 | S, I |
| DLS1 | R1 | g1/0/11 | g0/0/1 | R, S, I |
| | ALS1 | g1/0/5 | g1/0/1 | R, S, I |
| | ALS1 | g1/0/6 | g1/0/1 | R, S, I |
| | DLS2 | g1/0/4 | g1/0/4 | R, S, I |
| | DLS2 | g1/0/3 | g1/0/3 | R, S, I |
| | MGMT3 | g0/0 | g1/0/21 | R, S, I |
| DLS2 | R3 | g1/0/11 | g1/0/21 | S, I |
| | ALS1 | g1/0/5 | g1/0/3 | R, S, I |
| | ALS1 | g1/0/6 | g1/0/4 | R, S, I |
| | DLS1 | g1/0/4 | g1/0/4 | R, S, I |
| | DLS1 | g1/0/3 | g1/0/3 | R, S, I |
| | MGMT3 | g0/0 | g1/0/22 | S, I |
| ALS1 | DLS2 | g1/0/4 | g1/0/6 | R, S, I |
| | DLS2 | g1/0/3 | g1/0/5 | R, S, I |
| | DLS1 | g1/0/2 | g1/0/5 | R, S, I |
| | DLS1 | g1/0/1 | g1/0/20 | R, S, I |
| | MGMT3 | g0/0 | g1/0/20 | S, I |

## NTP show and associations

**Commands → show ntp status, show ntp associations**

→ R2 is the root NTP server for this network as it uses its own internal clock as reference
→ all switches are NTP clients synchronized to 10.1.202.1

| Device | Clock status | Stratum | Reference server | Offset (ms) | Associations |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| R1 | Synchronised | 4 | 10.1.202.1 | ~4.5000 | Peered with 10.1.202.1 |
| R2 | Synchronised | 3 | 127.127.1.1 (local) | ~0.0 | Source clock (Master) |
| R3 | Synchronised | 4 | 10.1.202.1 | ~5.5000 | Peered with 10.1.202.1 |
| DLS1 | Synchronised | 4 | 10.1.202.1 | ~10.5000 | Peered with 10.1.202.1 |
| DLS2 | Synchronised | 4 | 10.1.202.1 | ~4.5000 | Peered with 10.1.202.1 |
| ALS1 | Synchronised | 4 | 10.1.202.1 | ~2.5000 | Peered with 10.1.202.1 |

## Network security

**command : show ip ssh**

| Device | SSH version | Key type/ID | Key size | Crypto support |
|---|---|---|---|---|
| R1 | 1.99 | Self-signed (RSA) | 2048-bit | Default SSH support |
| R2 | 1.99 | Self-signed (RSA) | 2048-bit | Default SSH support |
| R3 | 1.99 | Self-signed (RSA) | 2048-bit | Default SSH support |
| DLS1 | — | Self-signed ID: 3453042425 | — | Default SSH support |
| DLS2 | — | Self-signed ID: 1249330207 | — | Dual-stack (ipv4/ipv6), AES + SHA-2 |
| ALS1 | — | Self-signed ID: 135570298 | — | Same crypto as DLS1 & DLS2 (AES +SHA-2) |

## ACLs

**Command: show access-lists**

| Device | ACL name | |
|---|---|---|
| DLS1 | Implicit_deny | Deny ip any any |
| | implicit_permit | Permit ip any any |
| | meraki-fqdn-dns | Allow DNS queries |
| | preauth_v4 | Permit DNS/DHCP, deny rest |
| | preauth_v6 | Permit DNS, ICMPv6 nd/ra/rs, DHCPv6, deny rest |
| DLS2 | Implicit_deny | Deny ip any any |
| | implicit_permit | Permit ip any any |
| | meraki-fqdn-dns | Allow DNS queries |
| | preauth_v4 | Permit DNS/DHCP, deny rest |
| | preauth_v6 | Permit DNS, ICMPv6 nd/ra/rs, DHCPv6, deny rest |
| ALS1 | Implicit_deny | Deny ip any any |
| | implicit_permit | Permit ip any any |
| | meraki-fqdn-dns | Allow DNS queries |
| | preauth_v4 | Permit DNS/DHCP, deny rest |
| | REMOTEv6 | Deny ipv6 any any |
| | preauth_v6 | Permit DNS/ ICMPv6 ND/RA/RS, DHCPv6, deny rest |

## DHCP

**Command: show running-config | section dhcp**

| DEVICE | ROLE | IPv4 DHCP pools | IPv6 DHCP pools | Client ID | DHCP snooping |
|---|---|---|---|---|---|
| R1 | DHCP client | ____ | ____ | FLM242611Y2 | ____ |

| | | | | | |
|---|---|---|---|---|---|
| R2 | DHCP client | ____ | ____ | FLM242611XU | ____ |
| R3 | DHCP client | ____ | ____ | FLM242611YF | ____ |
| DLS1 | DHCP server + client | VOICE (10.1.200.0/24), GUEST (10.1.1.110.0/24), OFFICE (10.1.120.0/24) | OFFICE, VOICE, GUEST | FOC2420LBDV | Enabled |
| DLS2 | DHCP client | ____ | ____ | FOC2420LBND | Enabled |
| ALS1 | DHCP client | ____ | ____ | JAE2421VD2 | Enabled |

**Command: show ip dhcp pool**

| Pool | Address range | Total | Excluded | Leased |
|---|---|---|---|---|
| VOICE | 10.1.200.1 - 10.1.200.254 | 254 | 4 | 0 |
| GUEST | 10.1.110.2 - 10.1.110.254 | 254 | 4 | 1 |
| OFFICE | 10.1.120.1 - 10.1.120.254 | 254 | 4 | 0 |

## DNS

**Commands: show hosts**

→ default domain: tshoot.net

→ name server: 255.255.255.255 (local)

| Host | IP addresses |
|---|---|
| R1 | 10.1.99.1 |
| R2 | 10.1.2.1, 10.1.99.252 |

| | |
|---|---|
| R3 | 10.1.2.13, 10.1.99.253 |
| DLS1 | 10.1.1.1, 10.1.2.2, 10.1.201.1 |
| DLS2 | 10.1.202.1, 10.1.1.6, 10.1.1.2 |
| ALS1 | 10.1.2.14, 10.1.1.5, 10.1.203.1 |

## Static Routes

**Commands: show running-config | include ip router, show running-config | include ipv6 route**

ip route 0.0.0.0 0.0.0.0 10.1.99.254
ipv6 router ::/0 2001:DB8:CAFE:99::D1

## SNMP

**Command: show snmp**

→ SNMP contact: support@tshoot.net
→ location: TSHOOT Lab Facility
→ logging destination: 10.1.100.1.162
→ global trap: disabled
→ SNMP logging: enabled on all devices

| Device | Packets in | Packets out | Traps sent | Errors/drops | Logging |
|---|---|---|---|---|---|
| R1 | 0 | 7 | 7 | 0 | 10.1.100.1.162 |
| R2 | 0 | 5 | 5 | 0 | 10.1.100.1.162 |
| R3 | 0 | 7 | 7 | 0 | 10.1.100.1.162 |
| DLS1 | 0 | 16 | 16 | 2 | 10.1.100.1.162 |
| DLS2 | 0 | 22 | 22 | 8 | 10.1.100.1.162 |

**Command: show snmp group**

| Group name | Security model | Read view | Write view | Notify view |
|---|---|---|---|---|
| ILMI | v1, v2c | *ilmi | *ilmi | None |

| | | | | |
|---|---|---|---|---|
| cisco | v1, v2c | v1default | None | Default / tv.FFFF |
| san-fran | v1, v2c | v1default | v1default | None |

**Command: show snmp host**

→ destination host: 10.1.100.1
→ UDP port: 162
→ type: trap
→ user: cisco
→ security model: v2c

## Troubleshooting methods:

→ divide and conquer
→ bottom-up method
→ top-down method
→ follow the path

## EIGRP (AS 1)

| Device | Interface | IPv4 Neighbor | IPv6 Neighbor |
|---|---|---|---|
| R1 | g0/0/1 | 10.1.2.1 | fe80::D1 |
| | g0/0/0 | 10.1.1.2 | fe80::2 |
| R2 | g0/0/1 | 10.1.1.5 | fe80::3 |
| | g0/0/0 | 10.1.1.1 | fe80::1 |
| R3 | g0/0/0 | 10.1.1.6 | fe80::2 |
| | g0/0/1 | 10.1.2.13 | fe80::D2 |
| DLS1 | g1/0/11 | 10.1.2.2 | fe80::1 |
| | vlan99 | 10.1.99.254 | fe80::D2 |
| | vlan100 | 10.1.100.253 | fe80::D2 |
| | vlan200 | 10.1.200.253 | fe80::D2 |
| | vlan120 | 10.1.120.253 | fe80::D2 |
| | vlan110 | 10.1.110.253 | fe80::D2 |
| DLS2 | vlan99 | 10.1.99.252 | fe80::D1 |
| | vlan100 | 10.1.100.252 | fe80::D1 |
| | vlan200 | 10.1.200.252 | fe80::D1 |
| | vlan120 | 10.1.120.252 | fe80::D1 |
| | vlan110 | 10.1.110.252 | fe80::D1 |
| | g1/0/11 | 10.1.2.14 | fe80::3 |