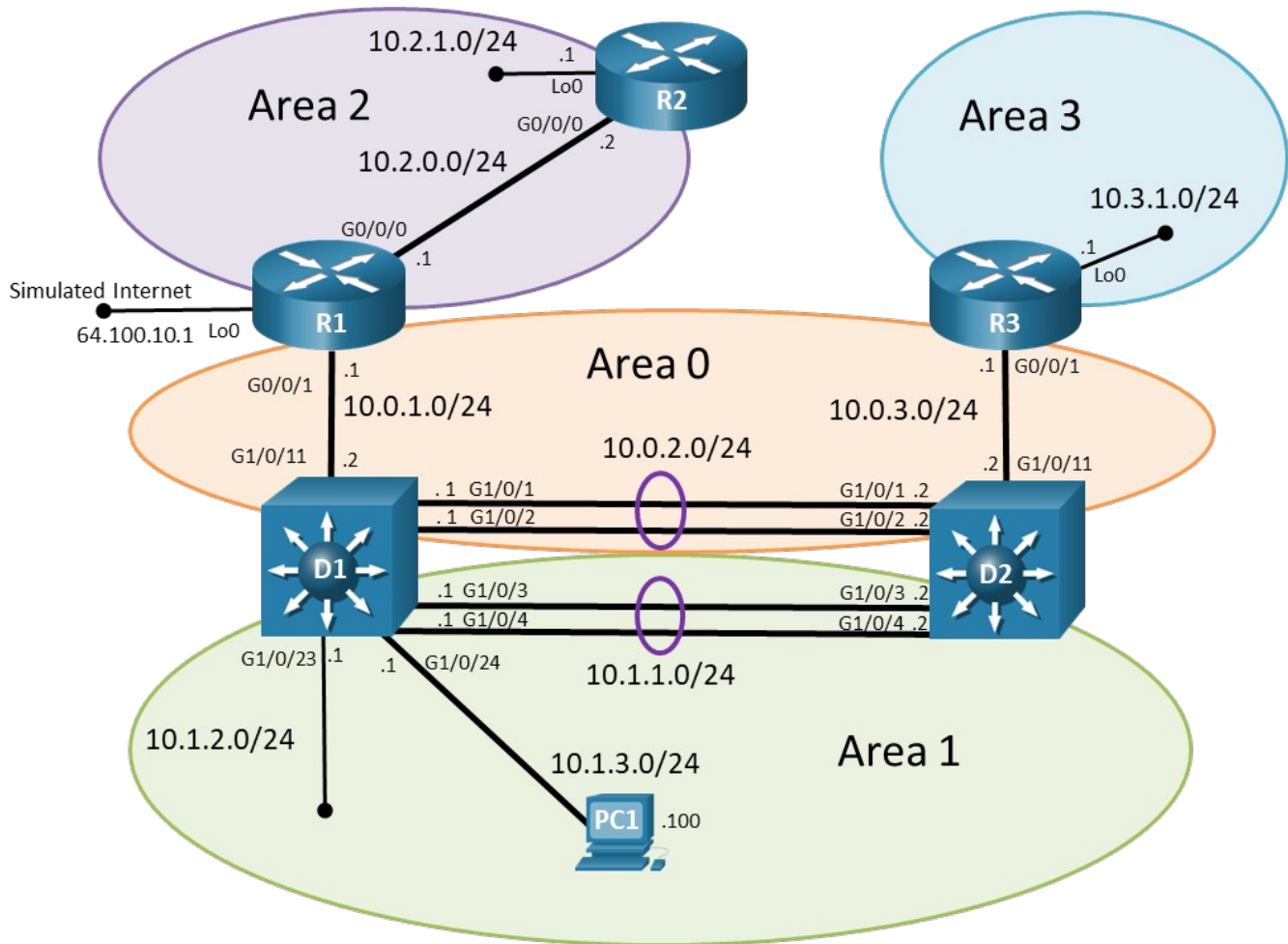


## Lab - Troubleshoot OSPFv2 (Instructor Version)

**Instructor Note:** Red font color or gray highlights indicate text that appears in the instructor copy only.

### Topology



### Addressing Table

Device	Interface	IPv4 Address	Subnet Mask
R1	G0/0/0	10.2.0.1	255.255.255.0
	G0/0/1	10.0.1.1	255.255.255.0
R2	G0/0/0	10.2.0.2	255.255.255.0
	Lo1	10.2.1.1	255.255.255.0
R3	G0/0/1	10.0.3.1	255.255.255.0
	Lo1	10.3.1.1	255.255.255.0

Device	Interface	IPv4 Address	Subnet Mask
D1	G1/0/1 (Po1)	10.0.2.1	255.255.255.0
	G1/0/2 (Po1)	10.0.2.1	255.255.255.0
	G1/0/3 (Po2)	10.1.1.1	255.255.255.0
	G1/0/4 (Po2)	10.1.1.1	255.255.255.0
	G1/0/11	10.0.1.2	255.255.255.0
	G1/0/23	10.1.2.1	255.255.255.0
	G1/0/24	10.1.3.1	255.255.255.0
D2	G1/0/1 (Po1)	10.0.2.2	255.255.255.0
	G1/0/2 (Po1)	10.0.2.2	255.255.255.0
	G1/0/3 (Po2)	10.1.1.2	255.255.255.0
	G1/0/4 (Po2)	10.1.1.2	255.255.255.0
	G1/0/11	10.0.3.2	255.255.255.0
PC1	NIC	10.1.3.100/24	Default Gateway 10.1.3.1

## Objectives

Troubleshoot network issues related to the configuration and operation of OSPFv2.

## Background / Scenario

Your University network is using multiarea OSPFv2. The 10.3.1.0/24 network has a single end device which connects to an observatory. Reading the network design documentation, you notice two key items regarding this connection:

- The connection from R3 to the observatory is a microwave link. Because this link can be unstable, it is required to be in its own OSPFv2 area.
- The data from the observatory is sent to an astronomy research team on the 10.1.3.0/24 network (PC1).

Although the topology has a limited number of routers, you should use the appropriate troubleshooting commands to help find and solve the problems in the three trouble tickets as if this were a much more complex topology with many more routers and networks.

You will be loading configurations with intentional errors onto the network. Your tasks are to FIND the error(s), document your findings and the command(s) or method(s) used to fix them, FIX the issue(s) presented here and then test the network to ensure both of the following conditions are met:

- 1) the complaint received in the ticket is resolved
- 2) full reachability is restored

**Note:** The routers used with CCNP hands-on labs are Cisco 4221 with Cisco IOS XE Release 16.9.4 (universalk9 image). The switches used in the labs are Cisco Catalyst 3650 with Cisco IOS XE Release 16.9.4 (universalk9 image) and Cisco Catalyst 2960s with Cisco IOS Release 15.2(2) (lanbasek9 image). Other routers, switches, and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and the output produced might vary from what is shown in the labs. Refer to the Router Interface Summary Table at the end of the lab for the correct interface identifiers.

**Note:** Make sure that the switches have been erased and have no startup configurations. If you are unsure, contact your instructor.

**Instructor Note:** Refer to the Instructor Lab Manual for the procedures to initialize and reload devices.

### Required Resources

- 3 Routers (Cisco 4221 with Cisco IOS XE Release 16.9.4 universal image or comparable)
- 2 Switches (Cisco 3560 with Cisco IOS XE Release 16.9.4 universal image or comparable)
- 1 PC (choice of operating system with terminal emulation program installed)
- Console cables to configure the Cisco IOS devices via the console ports
- Ethernet cables as shown in the topology

### Instructions

#### Part 1: Trouble Ticket 8.1.2.1

##### Scenario:

Changes were made to minimize the number of routes in area 2. The intention was that all internal OSPF routers in area 2 would only receive a default route via OSPF, and they would not receive any interarea OSPF routes. However, after the change was made users began to indicate that they no longer have connectivity to devices on the 10.2.1.0/24 network.

Use the commands listed below to load the configuration files for this trouble ticket:

**Instructor Note:** Commands for uploading the configuration are provided at the end of this document.

Device	Command
R1	<code>copy flash:/enarsi/8.1.2.1-r1-config.txt run</code>
R2	<code>copy flash:/enarsi/8.1.2.1-r2-config.txt run</code>
R3	<code>copy flash:/enarsi/8.1.2.1-r3-config.txt run</code>
D1	<code>copy flash:/enarsi/8.1.2.1-d1-config.txt run</code>
D2	<code>copy flash:/enarsi/8.1.2.1-d2-config.txt run</code>

- All routers should have the 10.2.1.0/24 network in their routing tables.
- All area 2 internal OSPF routers should only receive a default route via OSPF, they should not have any interarea routes.
- PC1 should be able to ping 10.2.1.1/24.
- R3, D1, and D2 should see the 10.2.1.0/24 network in their routing table.
- R2 should only have a single OSPF route in its routing table, and that should be a default route learned via OSPF.
- When you have fixed the ticket, change the MOTD on EACH DEVICE using the following command:  
**banner motd # This is \$(hostname) FIXED from ticket <ticket number> #**
- Then save the configuration by issuing the **wri** command (on each device).
- Inform your instructor that you are ready for the next ticket.

- After the instructor approves your solution for this ticket, issue the **reset.now** privileged EXEC command. This script will clear your configurations and reload the devices.

### Instructor Notes:

This trouble ticket contains 2 intentional errors:

- 1) **R1**: OSPF area 2 is configured as a stub area instead of a totally stubby area.
- 2) **R2**: OSPF area 2 is configured as a normal area.

The commands used to fix these errors should be:

```
R1(config)# router ospf 1
R1(config-router)# no area 2 stub
R1(config-router)# area 2 stub no-summary

R2(config)# router ospf 1
R2(config-router)# area 2 stub
```

## Part 2: Trouble Ticket 8.1.2.2

### Scenario:

Recently Layer 3 switch D2 was replaced. However, the backup config file was corrupt and unable to be used. One of the network technicians configured D2 manually using the network documentation including the topology. After D2 was brought online, D2's routing table only sees the 10.3.1.0/24 network via OSPF.

Use the commands listed below to load the configuration files for this trouble ticket:

**Instructor Note:** Commands for creating these files are at the end of this document.

Device	Command
R1	<code>copy flash:/enarsi/8.1.2.2-r1-config.txt run</code>
R2	<code>copy flash:/enarsi/8.1.2.2-r2-config.txt run</code>
R3	<code>copy flash:/enarsi/8.1.2.2-r3-config.txt run</code>
D1	<code>copy flash:/enarsi/8.1.2.2-d1-config.txt run</code>
D2	<code>copy flash:/enarsi/8.1.2.2-d2-config.txt run</code>

- D2 should see all OSPF networks.
- When you have fixed the ticket, change the MOTD on EACH DEVICE using the following command:  
**banner motd # This is \$(hostname) FIXED from ticket <ticket number> #**
- Then save the configuration by issuing the **wri** command (on each device).
- Inform your instructor that you are ready for the next ticket.
- After the instructor approves your solution for this ticket, issue the **reset.now** privileged EXEC command. This script will clear your configurations and reload the devices.

### Instructor Notes:

This trouble ticket contains 2 intentional errors. D2 has the wrong subnet mask on both port-channel 1 and port-channel 2. This prohibited D2 from forming an OSPF adjacency with D1. Port-channel 1 on D2 does not have an IP address because it had the wrong subnet mask that caused it to overlap the G1/0/11 interface.

This creates overlapping subnets causing port-channel 1 to be shutdown. Port-channel 2 was also configured the wrong subnet mask.

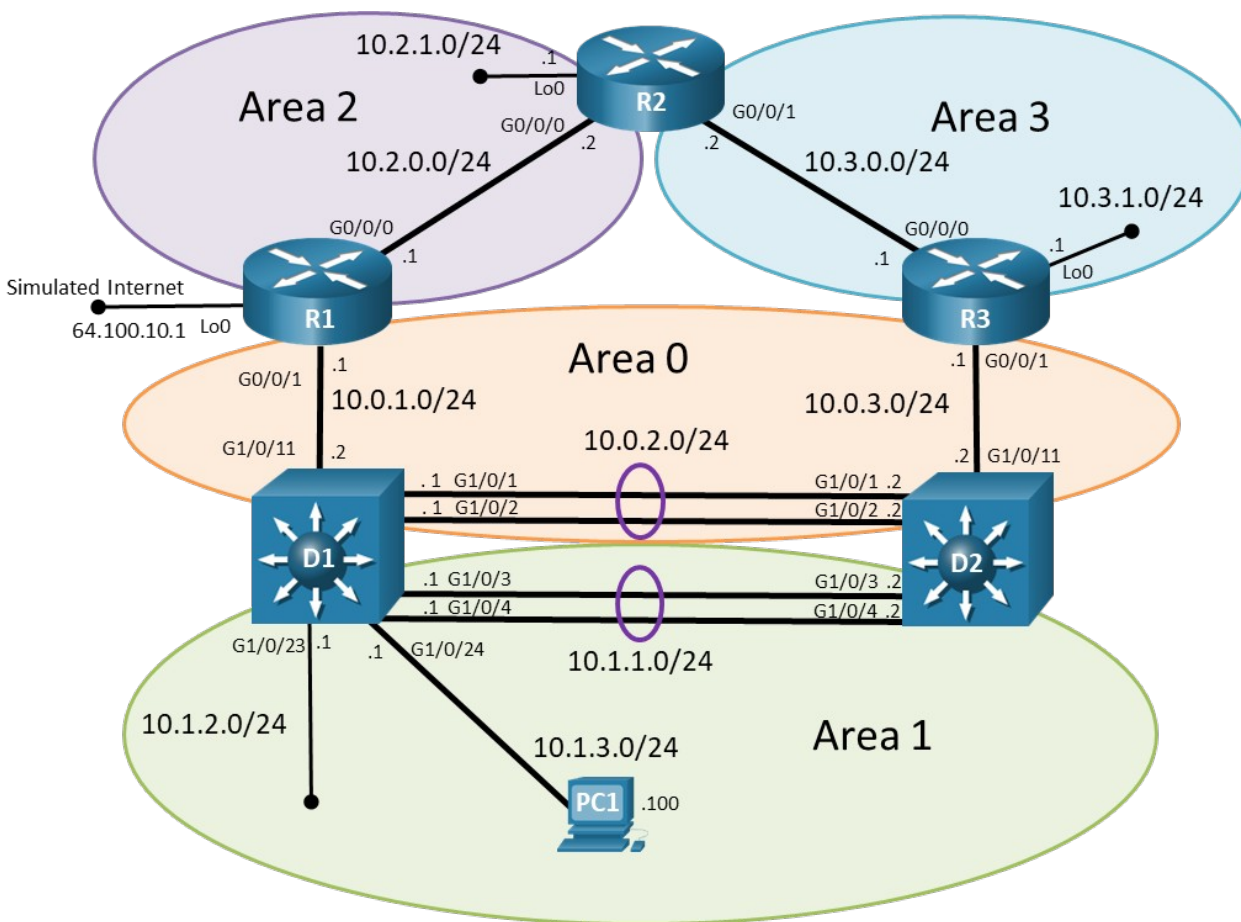
The commands used to fix these errors should be:

```
D2(config)# interface port-channel 1
D2(config-if)# ip address 10.0.2.2 255.255.255.0
D2(config-if)# no shutdown
D2(config-if)# exit
D2(config)# interface port-channel 2
D2(config-if)# ip address 10.1.1.2 255.255.255.0
D2(config-if)# no shutdown
```

**Note:** The **no shutdown** command will be required on at least one interface.

### Part 3: Trouble Ticket 8.1.2.3

Topology Update:



Addressing Table Update:

Device	Interface	IPv4 Address	Subnet Mask
R2	G0/0/0	10.2.0.2	255.255.255.0
	G0/0/1	10.3.0.2	255.255.255.0

Device	Interface	IPv4 Address	Subnet Mask
	Lo1	10.2.1.1	255.255.255.0
R3	G0/0/0	10.3.0.1	255.255.255.0
	G0/0/1	10.0.3.1	255.255.255.0
	Lo1	10.3.1.1	255.255.255.0

**Scenario:**

The 10.3.1.0/24 network has a single end device which connects to an observatory. Reading the network design documentation, you notice three key items:

- The connection from R3 to the observatory is a microwave link. Because this link can be unstable, it is required to be in its own OSPFv2 area. The data from the observatory is sent to an astronomy research team on the 10.1.3.0/24 network (PC5).
- For redundancy purposes the design team had installed a new link between R2 and R3. This link results in an additional path from R1 to PC5. The primary path is through D2 to R3. The new backup path is through R2 to R3. This is verified using traceroute.
- Although redundancy is helpful, the most important requirement is that 10.1.3.0/24 is in its own OSPF area.

A troubleshooting ticket has just been received by the help desk. During construction of a new building on campus, the link between R3 and D2 was cut. It may take four or five days before this link can be restored.

The astronomy team has informed your manager that they are not receiving the data from the observatory and they cannot wait more than a day for the data from the observatory. Your manager is confused about why the data is not being forwarded using the redundant connection via R2.

Your task is to diagnose this problem and resolve it. Connectivity between the 10.3.1.0/24 and 10.1.3.0/24 networks is critical. In addition, the 10.3.1.0/24 network must be in its own area so the unstable link does not affect other areas.

**Note:** OSPF area 2 and area 3 are both normal OSPF areas.

Use the commands listed below to load the configuration files for this trouble ticket:

**Instructor Note:** Commands for creating these files are at the end of this document.

Device	Command
R1	<code>copy flash:/enarsi/8.1.2.3-r1-config.txt run</code>
R2	<code>copy flash:/enarsi/8.1.2.3-r2-config.txt run</code>
R3	<code>copy flash:/enarsi/8.1.2.3-r3-config.txt run</code>
D1	<code>copy flash:/enarsi/8.1.2.3-d1-config.txt run</code>
D2	<code>copy flash:/enarsi/8.1.2.3-d2-config.txt run</code>

**Note:** To simulate the link being cut, shut down the G0/0/1 interface on R3:

```
R3(config)# inter g 0/0/1
R3(config-if)# shutdown
```

- PC1 should be able to ping the 10.3.1.1.
- Network 10.3.1.0/24 must be in its own area.

- When you have fixed the ticket, change the MOTD on EACH DEVICE using the following command:  
**banner motd # This is \$(hostname) FIXED from ticket <ticket number> #**
- Then save the configuration by issuing the **wri** command (on each device).
- Inform your instructor that you are ready for the next ticket.
- After the instructor approves your solution for this ticket, issue the **reset.now** privileged EXEC command. This script will clear your configurations and reload the devices.

### Instructor Notes:

This trouble ticket contains a design error. ABR R2 belongs to two areas, area 2 and area 3. The OSPF specification states that an ABR is restricted to considering LSA 3s only from the backbone area (area 0) to avoid routing loops. After the link between R3 and D2 went down, the networks in area 3 were no longer reachable via OSPF from other areas. R2 will not be propagating LSA 3s from area 3 (a non-backbone area) into area 2.

A virtual link will need to be created between R1 and R2 to restore connectivity.

The commands used to fix these errors should be:

```
R1(config)# router ospf 1
R1(config-router)# area 2 virtual-link 2.2.2.2
```

```
R2(config)# router ospf 1
R2(config-router)# area 2 virtual-link 1.1.1.1
```

### Router Interface Summary Table

Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
1800	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
1900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2801	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)
2811	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
4221	Gigabit Ethernet 0/0/0 (G0/0/0)	Gigabit Ethernet 0/0/1 (G0/0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)
4300	Gigabit Ethernet 0/0/0 (G0/0/0)	Gigabit Ethernet 0/0/1 (G0/0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)

**Note:** To find out how the router is configured, look at the interfaces to identify the type of router and how many interfaces the router has. There is no way to effectively list all the combinations of configurations for each router class. This table includes identifiers for the possible combinations of Ethernet and Serial interfaces in the device. The table does not include any other type of interface, even though a specific router may contain one. An example of this might be an ISDN BRI interface. The string in parenthesis is the legal abbreviation that can be used in Cisco IOS commands to represent the interface.



## Uploading Configuration Files

Use the commands below to create the configuration files for each trouble ticket in this lab on the lab devices. The TCL script commands help create and copy the configurations. However, the configuration commands could also be copied and pasted directly into global config mode on each device. Simply remove the TCL script commands, enter the **enable** and **configure t** commands on the device, and copy and paste the configuration commands.

**Important:** The device requires a folder in flash named **enarsi**. Use the **dir** command to verify. If the folder is missing, then create it using the **mkdir flash:/enarsi** privileged exec command. For all switches, make sure the **vlan.dat** file is set to the default. Use the **delete vlan.dat** privileged EXEC command, if necessary.

### Reset scripts

These TCL scripts will completely clear and reload the device in preparation for the next ticket. Copy and paste the appropriate script to the appropriate device.

#### Router Reset Script

```
tclsh
puts [ open "flash:/enarsi/reset.tcl" w+ ] {
typeahead "\n"
copy running-config startup-config
typeahead "\n"
erase startup-config
puts "Reloading the router"
typeahead "\n"
reload
}
tclquit
```

**D1/D2 (Cisco 3650) Reset Script** - The default 3650 SDM template supports IPv6 by default, so it is not set by this script.

```
tclsh
puts [ open "flash:/enarsi/reset.tcl" w+ ] {
typeahead "\n"
copy running-config startup-config
typeahead "\n"
erase startup-config
delete /force vlan.dat
puts "Reloading the switch"
typeahead "\n"
reload
}
tclquit
```

**A1 (Cisco 2960 Script)** - The default 2960 SDM template does not support IPv6, so this script includes that setting.

```
tclsh
puts [ open "flash:reset.tcl" w+ ] {
typeahead "\n"
copy running-config startup-config
```



```
typeahead "\n"
erase startup-config
delete /force vlan.dat
delete /force multiple-fs
ios_config "sdm prefer lanbase-routing"
typeahead "\n"
puts "Reloading the switch in 1 minute, type reload cancel to halt"
typeahead "\n"
reload
}
tclquit
```

## **R1 Configuration File Scripts**

### **!R1 - Trouble Ticket # 1**

```
tclsh
puts [ open "flash:/enarsi/8.1.2.1-r1-config.txt" w+ ] {
hostname R1
banner motd # This is R1, Trouble Ticket 8.1.2.1 #
no ip domain lookup
line con 0
logg sync
exec-time 0 0
exit
inter g 0/0/0
ip add 10.2.0.1 255.255.255.0
no shut
inter g 0/0/1
ip add 10.0.1.1 255.255.255.0
no shut
int lo0
ip add 64.100.10.1 255.255.255.0
router ospf 1
router-id 1.1.1.1
network 10.0.1.0 0.0.0.255 area 0
network 10.2.0.0 0.0.0.255 area 2
default-information originate always
area 2 stub
exit
ip route 0.0.0.0 0.0.0.0 lo0
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
tclquit
```

**!R1 - Trouble Ticket # 2**

```
tclsh
puts [ open "flash:/enarsi/8.1.2.2-r1-config.txt" w+ ] {
hostname R1
banner motd # This is R1, Trouble Ticket 8.1.2.2 #
no ip domain lookup
line con 0
logg sync
exec-time 0 0
exit
inter g 0/0/0
ip add 10.2.0.1 255.255.255.0
no shut
inter g 0/0/1
ip add 10.0.1.1 255.255.255.0
no shut
int lo0
ip add 64.100.10.1 255.255.255.0
router ospf 1
router-id 1.1.1.1
network 10.0.1.0 0.0.0.255 area 0
network 10.2.0.0 0.0.0.255 area 2
default-information originate always
area 2 stub no-summary
exit
ip route 0.0.0.0 0.0.0.0 lo0
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
tclquit
```

**!R1 - Trouble Ticket # 3**

```
tclsh
puts [ open "flash:/enarsi/8.1.2.3-r1-config.txt" w+ ] {
hostname R1
banner motd # This is R1, Trouble Ticket 8.1.2.3 #
no ip domain lookup
line con 0
logg sync
exec-time 0 0
exit
inter g 0/0/0
ip add 10.2.0.1 255.255.255.0
```

```
no shut
inter g 0/0/1
ip add 10.0.1.1 255.255.255.0
no shut
int lo0
ip add 64.100.10.1 255.255.255.0
router ospf 1
router-id 1.1.1.1
network 10.0.1.0 0.0.0.255 area 0
network 10.2.0.0 0.0.0.255 area 2
default-information originate always
exit
ip route 0.0.0.0 0.0.0.0 lo0
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
tclquit
```

## R2 Configuration File Scripts

### !R2 - Trouble Ticket # 1

```
tclsh
puts [ open "flash:/enarsi/8.1.2.1-r2-config.txt" w+ ] {
hostname R2
banner motd # This is R2, Trouble Ticket 8.1.2.1 #
no ip domain lookup
line con 0
logg sync
exec-time 0 0
exit
inter g 0/0/0
ip add 10.2.0.2 255.255.255.0
no shut
inter lo 0
ip add 10.2.1.1 255.255.255.0
ip ospf network point-to-point
no shut
router ospf 1
router-id 2.2.2.2
network 10.2.1.0 0.0.0.255 area 2
network 10.2.0.0 0.0.0.255 area 2
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
```

```
yes
}
tclquit
```

### !R2 - Trouble Ticket # 2

```
tclsh
puts [ open "flash:/enarsi/8.1.2.2-r2-config.txt" w+ ] {
hostname R2
banner motd # This is R2, Trouble Ticket 8.1.2.2 #
no ip domain lookup
line con 0
logg sync
exec-time 0 0
exit
inter g 0/0/0
ip add 10.2.0.2 255.255.255.0
no shut
inter lo 0
ip add 10.2.1.1 255.255.255.0
ip ospf network point-to-point
no shut
router ospf 1
router-id 2.2.2.2
network 10.2.1.0 0.0.0.255 area 2
network 10.2.0.0 0.0.0.255 area 2
area 2 stub
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
tclquit
```

### !R2 - Trouble Ticket # 3

```
tclsh
puts [ open "flash:/enarsi/8.1.2.3-r2-config.txt" w+ ] {
hostname R2
banner motd # This is R2, Trouble Ticket 8.1.2.3 #
no ip domain lookup
line con 0
logg sync
exec-time 0 0
exit
inter g 0/0/0
ip add 10.2.0.2 255.255.255.0
no shut
```

```
inter g 0/0/1
ip add 10.3.0.2 255.255.255.0
no shut
inter lo 0
ip add 10.2.1.1 255.255.255.0
ip ospf network point-to-point
no shut
router ospf 1
router-id 2.2.2.2
network 10.2.1.0 0.0.0.255 area 2
network 10.2.0.0 0.0.0.255 area 2
network 10.3.0.0 0.0.0.255 area 3
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
tclquit
```

## R3 Configuration File Scripts

### !R3 - Trouble Ticket # 1

```
tclsh
puts [ open "flash:/enarsi/8.1.2.1-r3-config.txt" w+ ] {
hostname R3
banner motd # This is R3, Trouble Ticket 8.1.2.1 #
no ip domain lookup
line con 0
logg sync
exec-time 0 0
exit
inter g 0/0/1
ip add 10.0.3.1 255.255.255.0
no shut
inter lo 0
ip add 10.3.1.1 255.255.255.0
ip ospf network point-to-point
no shut
router ospf 1
router-id 3.3.3.3
network 10.0.3.0 0.0.0.255 area 0
network 10.3.1.0 0.0.0.255 area 3
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
```

```
}  
tclquit
```

**!R3 - Trouble Ticket # 2**

```
tclsh  
puts [ open "flash:/enarsi/8.1.2.2-r3-config.txt" w+ ] {  
hostname R3  
banner motd # This is R3, Trouble Ticket 8.1.2.2 #  
no ip domain lookup  
line con 0  
logg sync  
exec-time 0 0  
exit  
inter g 0/0/1  
ip add 10.0.3.1 255.255.255.0  
no shut  
inter lo 0  
ip add 10.3.1.1 255.255.255.0  
ip ospf network point-to-point  
no shut  
router ospf 1  
router-id 3.3.3.3  
network 10.0.3.0 0.0.0.255 area 0  
network 10.3.1.0 0.0.0.255 area 3  
alias exec reset.now tclsh flash:/enarsi/reset.tcl  
end  
clear ip ospf process  
yes  
}  
tclquit
```

**!R3 - Trouble Ticket # 3**

```
tclsh  
puts [ open "flash:/enarsi/8.1.2.3-r3-config.txt" w+ ] {  
hostname R3  
banner motd # This is R3, Trouble Ticket 8.1.2.3 #  
no ip domain lookup  
line con 0  
logg sync  
exec-time 0 0  
exit  
inter g 0/0/0  
ip add 10.3.0.1 255.255.255.0  
no shut  
inter g 0/0/1  
ip add 10.0.3.1 255.255.255.0
```

```
no shut
inter lo 0
ip add 10.3.1.1 255.255.255.0
ip ospf network point-to-point
no shut
router ospf 1
router-id 3.3.3.3
network 10.0.3.0 0.0.0.255 area 0
network 10.3.0.0 0.0.0.255 area 3
network 10.3.1.0 0.0.0.255 area 3
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
tclquit
```

## D1 Configuration File Scripts

### !D1 - Trouble Ticket # 1

```
tclsh
puts [ open "flash:/enarsi/8.1.2.1-d1-config.txt" w+ ] {
hostname D1
banner motd # This is D1, Trouble Ticket 8.1.2.1 #
no ip domain lookup
ip routing
line con 0
logg sync
exec-time 0 0
exit
inter g 1/0/11
no switchport
ip add 10.0.1.2 255.255.255.0
no shut
exit
inter g 1/0/23
no switchport
ip add 10.1.2.1 255.255.255.0
no shut
exit
inter g 1/0/24
no switchport
ip add 10.1.3.1 255.255.255.0
no shut
exit
interface g 1/0/1
```



```
description Channel to D2
no switchport
channel-group 1 mode on
no shutdown
exit
interface g 1/0/2
description Channel to D2
no switchport
channel-group 1 mode on
no shutdown
exit
interface g 1/0/3
description Channel to D2
no switchport
channel-group 2 mode on
no shutdown
exit
interface g 1/0/4
description Channel to D2
no switchport
channel-group 2 mode on
no shutdown
exit
inter port-channel 1
ip add 10.0.2.1 255.255.255.0
no shut
exit
inter port-channel 2
ip add 10.1.1.1 255.255.255.0
no shut
exit
inter range g1/0/5-10, g1/0/12-22
shut
router ospf 1
router-id 4.4.4.4
network 10.0.1.0 0.0.0.255 area 0
network 10.0.2.0 0.0.0.255 area 0
network 10.1.1.0 0.0.0.255 area 1
network 10.1.2.0 0.0.0.255 area 1
network 10.1.3.0 0.0.0.255 area 1
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
```

```
tclquit
```

### !D1 - Trouble Ticket # 2

```
tclsh
puts [ open "flash:/enarsi/8.1.2.2-d1-config.txt" w+ ] {
hostname D1
banner motd # This is D1, Trouble Ticket 8.1.2.2 #
hostname D1
no ip domain lookup
ip routing
line con 0
logg sync
exec-time 0 0
exit
inter g 1/0/11
no switchport
ip add 10.0.1.2 255.255.255.0
no shut
exit
inter g 1/0/23
no switchport
ip add 10.1.2.1 255.255.255.0
no shut
exit
inter g 1/0/24
no switchport
ip add 10.1.3.1 255.255.255.0
no shut
exit
interface g 1/0/1
description Channel to D2
no switchport
channel-group 1 mode on
no shutdown
exit
interface g 1/0/2
description Channel to D2
no switchport
channel-group 1 mode on
no shutdown
exit
interface g 1/0/3
description Channel to D2
no switchport
channel-group 2 mode on
no shutdown
```

```
exit
interface g 1/0/4
  description Channel to D2
  no switchport
  channel-group 2 mode on
  no shutdown
exit
inter port-channel 1
ip add 10.0.2.1 255.255.255.0
no shut
exit
inter port-channel 2
ip add 10.1.1.1 255.255.255.0
no shut
exit
inter range g1/0/5-10, g1/0/12-22
shut
router ospf 1
router-id 4.4.4.4
network 10.0.1.0 0.0.0.255 area 0
network 10.0.2.0 0.0.0.255 area 0
network 10.1.1.0 0.0.0.255 area 1
network 10.1.2.0 0.0.0.255 area 1
network 10.1.3.0 0.0.0.255 area 1
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
tclquit
```

**!D1 - Trouble Ticket # 3**

```
tclsh
puts [ open "flash:/enarsi/8.1.2.3-d1-config.txt" w+ ] {
hostname D1
banner motd # This is D1, Trouble Ticket 8.1.2.3 #
no ip domain lookup
ip routing
line con 0
logg sync
exec-time 0 0
exit
inter g 1/0/11
no switchport
ip add 10.0.1.2 255.255.255.0
no shut
```

```
exit
inter g 1/0/23
no switchport
ip add 10.1.2.1 255.255.255.0
no shut
exit
inter g 1/0/24
no switchport
ip add 10.1.3.1 255.255.255.0
no shut
exit
interface g 1/0/1
description Channel to D2
no switchport
channel-group 1 mode on
no shutdown
exit
interface g 1/0/2
description Channel to D2
no switchport
channel-group 1 mode on
no shutdown
exit
interface g 1/0/3
description Channel to D2
no switchport
channel-group 2 mode on
no shutdown
exit
interface g 1/0/4
description Channel to D2
no switchport
channel-group 2 mode on
no shutdown
exit
inter port-channel 1
ip add 10.0.2.1 255.255.255.0
no shut
exit
inter port-channel 2
ip add 10.1.1.1 255.255.255.0
no shut
exit
inter range g1/0/5-10, g1/0/12-22
shut
```

```
router ospf 1
router-id 4.4.4.4
network 10.0.1.0 0.0.0.255 area 0
network 10.0.2.0 0.0.0.255 area 0
network 10.1.1.0 0.0.0.255 area 1
network 10.1.2.0 0.0.0.255 area 1
network 10.1.3.0 0.0.0.255 area 1
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
tclquit
```

## D2 Configuration File Scripts

### !D2 - Trouble Ticket # 1

```
tclsh
puts [ open "flash:/enarsi/8.1.2.1-d2-config.txt" w+ ] {
hostname D2
banner motd # This is D2, Trouble Ticket 8.1.2.1 #
no ip domain lookup
ip routing
line con 0
logg sync
exec-time 0 0
exit
inter g 1/0/11
no switchport
ip add 10.0.3.2 255.255.255.0
no shut
interface g 1/0/1
description Channel to D1
no switchport
channel-group 1 mode on
no shutdown
interface g 1/0/2
description Channel to D1
no switchport
channel-group 1 mode on
no shutdown
interface g 1/0/3
description Channel to D1
no switchport
channel-group 2 mode on
no shutdown
```

```
interface g 1/0/4
  description Channel to D1
  no switchport
  channel-group 2 mode on
  no shutdown
inter port-channel 1
ip add 10.0.2.2 255.255.255.0
no shut
inter port-channel 2
ip add 10.1.1.2 255.255.255.0
no shut
inter range g1/0/5-10, g1/0/12-24
shut
router ospf 1
router-id 5.5.5.5
network 10.0.2.0 0.0.0.255 area 0
network 10.0.3.0 0.0.0.255 area 0
network 10.1.1.0 0.0.0.255 area 1
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
tclquit
```

**ID2 - Trouble Ticket # 2**

```
tclsh
puts [ open "flash:/enarsi/8.1.2.2-d2-config.txt" w+ ] {
hostname D2
banner motd # This is D2, Trouble Ticket 8.1.2.2 #
no ip domain lookup
ip routing
line con 0
logg sync
exec-time 0 0
exit
inter g 1/0/11
no switchport
ip add 10.0.3.2 255.255.255.0
no shut
interface g 1/0/1
  description Channel to D1
  no switchport
  channel-group 1 mode on
  no shutdown
interface g 1/0/2
```

```
description Channel to D1
no switchport
channel-group 1 mode on
no shutdown
interface g 1/0/3
description Channel to D1
no switchport
channel-group 2 mode on
no shutdown
interface g 1/0/4
description Channel to D1
no switchport
channel-group 2 mode on
no shutdown
inter port-channel 1
ip add 10.0.2.2 255.255.0.0
no shut
inter port-channel 2
ip add 10.1.1.2 255.255.0.0
no shut
inter range g1/0/5-10, g1/0/12-24
shut
router ospf 1
router-id 5.5.5.5
network 10.0.2.0 0.0.0.255 area 0
network 10.0.3.0 0.0.0.255 area 0
network 10.1.1.0 0.0.0.255 area 1
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
tclquit
```

**ID2 - Trouble Ticket # 3**

```
tclsh
puts [ open "flash:/enarsi/8.1.2.3-d2-config.txt" w+ ] {
hostname D2
ip routing
banner motd # This is D2, Trouble Ticket 8.1.2.3 #
no ip domain lookup
ip routing
line con 0
logg sync
exec-time 0 0
exit
```



```
inter g 1/0/11
no switchport
ip add 10.0.3.2 255.255.255.0
no shut
interface g 1/0/1
description Channel to D1
no switchport
channel-group 1 mode on
no shutdown
interface g 1/0/2
description Channel to D1
no switchport
channel-group 1 mode on
no shutdown
interface g 1/0/3
description Channel to D1
no switchport
channel-group 2 mode on
no shutdown
interface g 1/0/4
description Channel to D1
no switchport
channel-group 2 mode on
no shutdown
inter port-channel 1
ip add 10.0.2.2 255.255.255.0
no shut
inter port-channel 2
ip add 10.1.1.2 255.255.255.0
no shut
inter range g1/0/5-10, g1/0/12-24
shut
router ospf 1
router-id 5.5.5.5
network 10.0.2.0 0.0.0.255 area 0
network 10.0.3.0 0.0.0.255 area 0
network 10.1.1.0 0.0.0.255 area 1
alias exec reset.now tclsh flash:/enarsi/reset.tcl
end
clear ip ospf process
yes
}
tclquit
```

## A1 Configuration File Scripts - Not Used In This Lab