

113-SIG-3003
Implement Multi-Area Open Shortest Path First (OSPF) to Enable End-to-End Connectivity
Status: Approved

Distribution Restriction: Approved for public release; distribution is unlimited.

Destruction Notice: None

Foreign Disclosure: FD1 - This training product has been reviewed by the training developers in coordination with the US Army Signal School and FG foreign disclosure officer. This training product can be used to instruct international military students from all approved countries without restrictions.

Condition: Your network is fully operational. You have a requirement to make your network more efficient and scalable. You have a network plan, 3 Cisco Routers (with Cisco IOS release 15.2(4)M3 universal image or comparable), 1 PC (Windows 7, Vista, or XP with terminal emulation software), 1 console cable, 2 serial DCE/DTE cables.

Standard: Implements multi-area OSPF and issues the ping command to verify end-to-end connectivity.

Special Condition: None

Safety Risk: Low

MOPP 4:

Task Statements

Cue: None

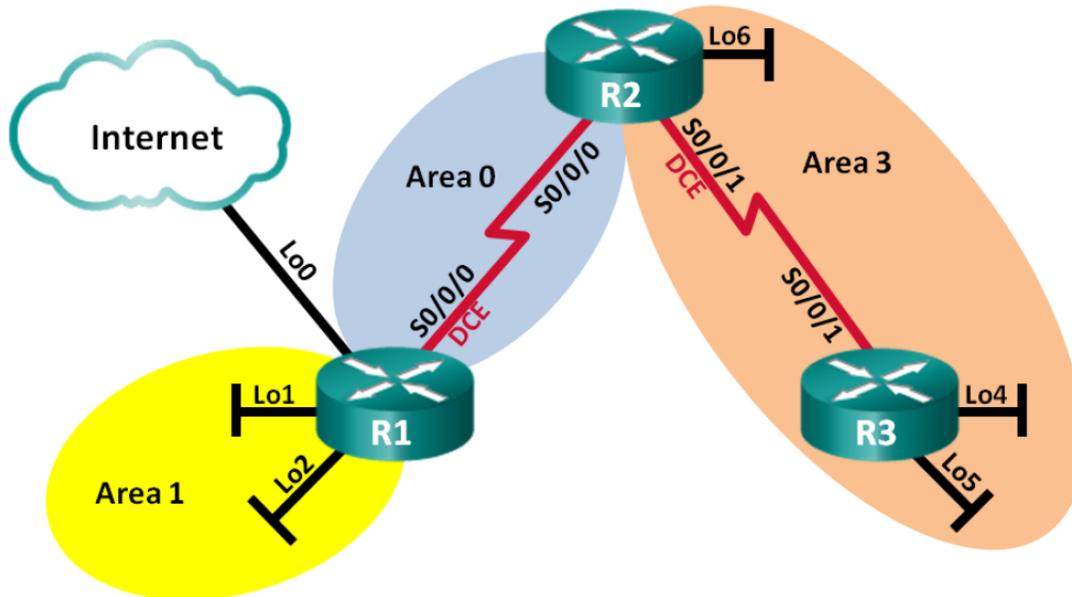
DANGER
None

WARNING
None

CAUTION
None

Remarks: None

Notes: All required references and technical manuals will be provided by the local Command via Cisco Networking Academy at www.netacad.com.



Multiarea OSPF Topology

Performance Steps

1. Configure multi-area OSPF.

a. Enable OSPF routing process for each router. `router(config)# router ospf {process id}`

b. Configure a router ID for the OSPF process for each router. `router(config-router)# router-id {32-bit unique address}`

c. Advertise each directly connected network and assign areas according to your network plan.
`router(config-router)# network {address} {wildcard mask} area #`

d. Set all interfaces not participating in the OSPF process to passive.
`router(config-router)# passive-interface {interface-type}`

e. Create a static default route to the internet using exit interface.
 NOTE: this step only applies to router(s) connecting to the internet.
`router(config)# ip route 0.0.0.0 0.0.0.0 {interface-type that connects to the internet}`

f. Configure OSPF to propagate the static default route to neighbor routers.
 NOTE: this step only applies to router(s) connecting to the internet.
`router(config-router)# default-information originate`

2. Configure MD5 authentication on all serial interfaces.

a. Assign an MD5 key for OSPF authentication to the appropriate interface.
`router(config)# interface {interface-type}`
`router(config-if)# ip ospf message-digest-key # md5 key-string-text`

b. Activate MD5 authentication for the OSPF process. router(config-if)# ip ospf authentication message-digest

c. Set up OSPF authentication for each area level. router(config-router)# area # authentication message-digest

3. Configure interarea summary routes.

a. Calculate the summary route for the networks in the appropriate areas.

b. Consolidate and summarize OSPF routes for each area

```
router(config)# router ospf #  
router(config-router)# area # range {ip-address} {subnet-mask}
```

4. Verify end-to-end connectivity. router#ping {ip address}

(Asterisks indicates a leader performance step.)

Evaluation Guidance: Score the Soldier GO if all steps are passed (P). Score the Soldier NO GO if any step is failed (F). If the Soldier fails any step, show what was done wrong and how to do it correctly.

Evaluation Preparation: Setup: Ensure that the equipment is available, serviceable, and ready for use. Use the reference and evaluation guide to score the Soldier's performance. Brief Soldier: Tell the Soldier what is required IAW the task condition and standards.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Configured multi-area OSPF.			
2. Configured MD5 authentication on all serial interfaces.			
3. Configured interarea summary routes.			
4. Verified end-to-end connectivity.			

Supporting Reference(s): None

TADSS : None

Equipment Items (LIN): None

Materiel Items (NSN) :

Step ID	NSN	LIN	Title	Qty
	7025-01-581-2387	05004N	Cisco Integrated Router Gen 2: CISCO 2901/K9	3

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to the current Environmental Considerations manual and the current GTA Environmental-related Risk Assessment card.

Safety: In a training environment, leaders must perform a risk assessment in accordance with ATP 5-19, Risk Management. Leaders will complete the current Deliberate Risk Assessment Worksheet in accordance with the TRADOC Safety Officer during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed

during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination.

Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks : None

Supported Collective Tasks : None

ICTL Data :

ICTL Title	Personnel Type	MOS Data
MOS 25U Signal Support Systems Specialist Skill Levels 1, 2, 3, and 4	Enlisted	MOS: 25U
MOS 25C Radio Operator-Maintainer Skill Levels 1, 2, and 3	Enlisted	MOS: 25C
MOS 25Q Multichannel Transmission Systems Operator-Maintainer Skill Levels 1, 2, and 3	Enlisted	MOS: 25Q
MOS 25N Nodal Network Systems Operator-Maintainer Skill Levels 1, 2, and 3	Enlisted	MOS: 25N
MOS 25B Information Technology Specialist Skill Levels 1, 2, 3, 4 and 5	Enlisted	MOS: 25B
MOS 25L Cable Systems Installer-Maintainer Skill Levels 1, 2, and 3	Enlisted	MOS: 25L