

How to Build a CCNA Certification Practice Lab

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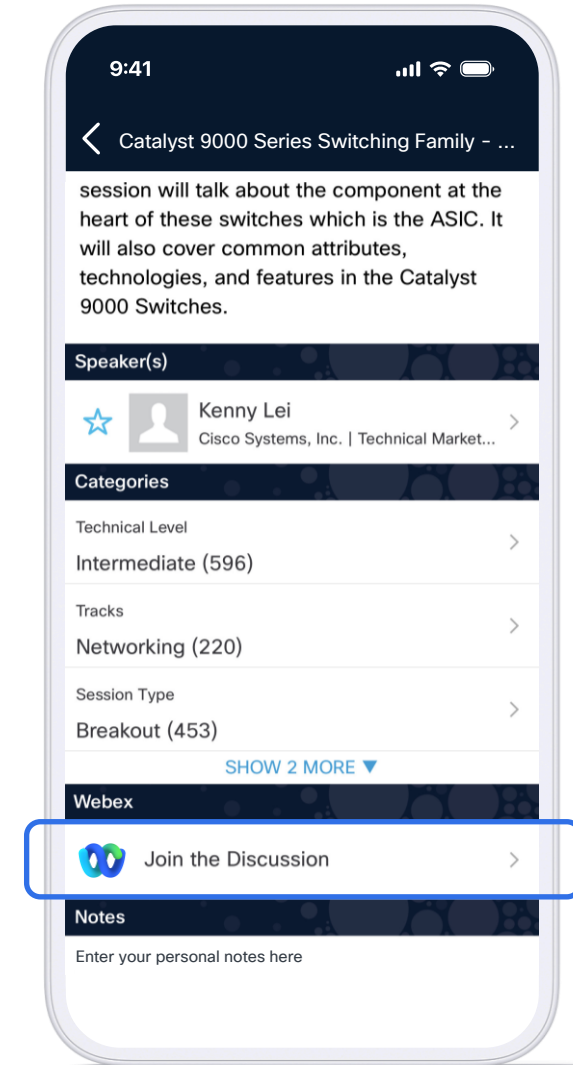
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Agenda

- 01 Introduction
- 02 Platform Options in Building a Lab
- 03 Methodology For Building Lab Exercises
- 04 Steps to Building an Adequate Lab Topology
- 05 Conclusion

Introduction

Introduction

Some Thoughts

- The Cisco Certified Network Associate (CCNA) is the entry-level certification
- The current exam to achieve the CCNA is 200-101 (V1.1)
- You can prepare using Cisco courses, Cisco Press titles, and other authorized sources
- Hands-On Exercises are a MUST!
- This session will focus on ways you can create a practical environment for CCNA preparation

Platforms Options in Building a Lab



Which of the Following Network Simulation/Emulation Tools Are You Familiar With?

Platforms Options in Building a Lab

Comparison of Options: Side by Side Look at CCNA Lab Deployments

Category

Platform Type

Cost

Hardware Required

Devices Supported

Connection Types

Best Used For

Platforms Options in Building a Lab

Comparison of Options: Side by Side Look at CCNA Lab Deployments

Category	Cisco PT
Platform Type	Simulator
Cost	Free
Hardware Required	Laptop or Desktop
Devices Supported	IOS
Connection Types	Serial & Ethernet
Best Used For	CCNA Only

Platforms Options in Building a Lab

Comparison of Options: Side by Side Look at CCNA Lab Deployments

Category	Cisco PT	CML
Platform Type	Simulator	Emulator
Cost	Free	\$0 - \$349
Hardware Required	Laptop or Desktop	Server/Laptop/PC
Devices Supported	IOS	IOS/ IOS-XR, NX-OS
Connection Types	Serial & Ethernet	Ethernet Only
Best Used For	CCNA Only	CCNA, CCNP, CCIE

Platforms Options in Building a Lab

Comparison of Options: Side by Side Look at CCNA Lab Deployments

Category	Cisco PT	CML	Physical Equipment
Platform Type	Simulator	Emulator	Physical
Cost	Free	\$0 - \$349	Varied
Hardware Required	Laptop or Desktop	Server/Laptop/PC	Multiple Devices
Devices Supported	IOS	IOS/ IOS-XR, NX-OS	Dependent on Devices
Connection Types	Serial & Ethernet	Ethernet Only	Device Dependent
Best Used For	CCNA Only	CCNA, CCNP, CCIE	CCNA, CCNP, CCIE

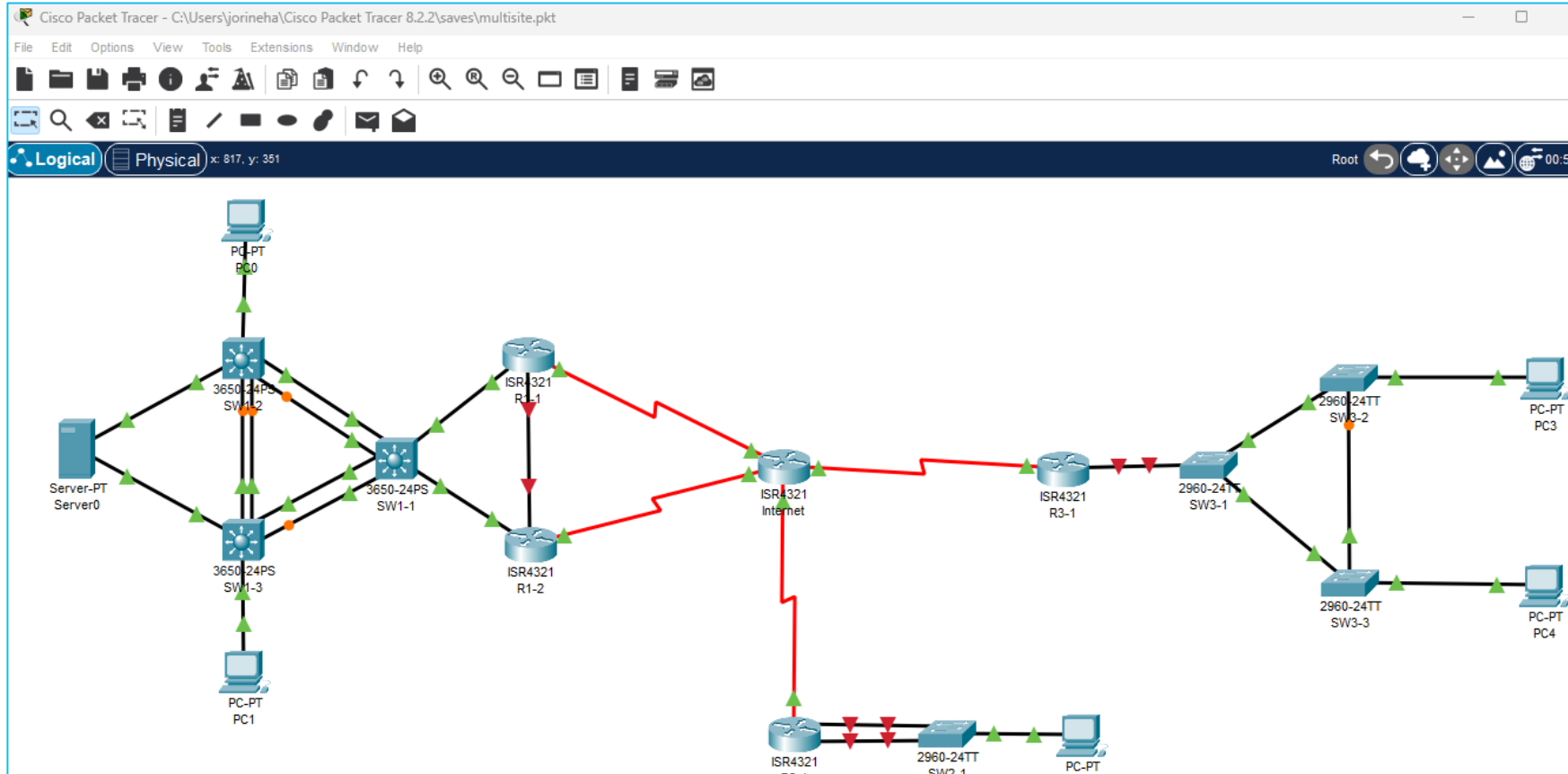
Platforms Options in Building a Lab

Option 1: Cisco Packet Tracer (Network Simulation Platform)

- Closely associated with the Cisco Network Academy
- Released in the 2000's (reported dates vary)
- Runs locally on a personal computer
 - Windows
 - Mac
 - Linux
- Network simulation platform
- Only supports Cisco networking devices

Platforms Options in Building a Lab

Option 1: Cisco Packet Tracer - Graphical User Interface



Platforms Options in Building a Lab

Option 1: Cisco Packet Tracer - Advantages

- Low resource requirements (can run on local desktop/laptop)
- Supports all device types used on the CCNA exam
- Free to download and use
- Easy to use/user-friendly
- Topology files can be saved or exported
- Geared to beginning-level students
- Realistic lab and CLI experience

Platforms Options in Building a Lab

Option 1: Cisco Packet Tracer - Disadvantages

- Simulator
- Limited feature support (VRRP, iBGP, etc., are examples)
- Does not use actual IOS code
- Unsuitable for higher-level certifications (CCNP, CCIE, etc.)
- No ability to integrate with device outside the platform
- Limited show and debug commands
- Great for beginners but not more advanced students

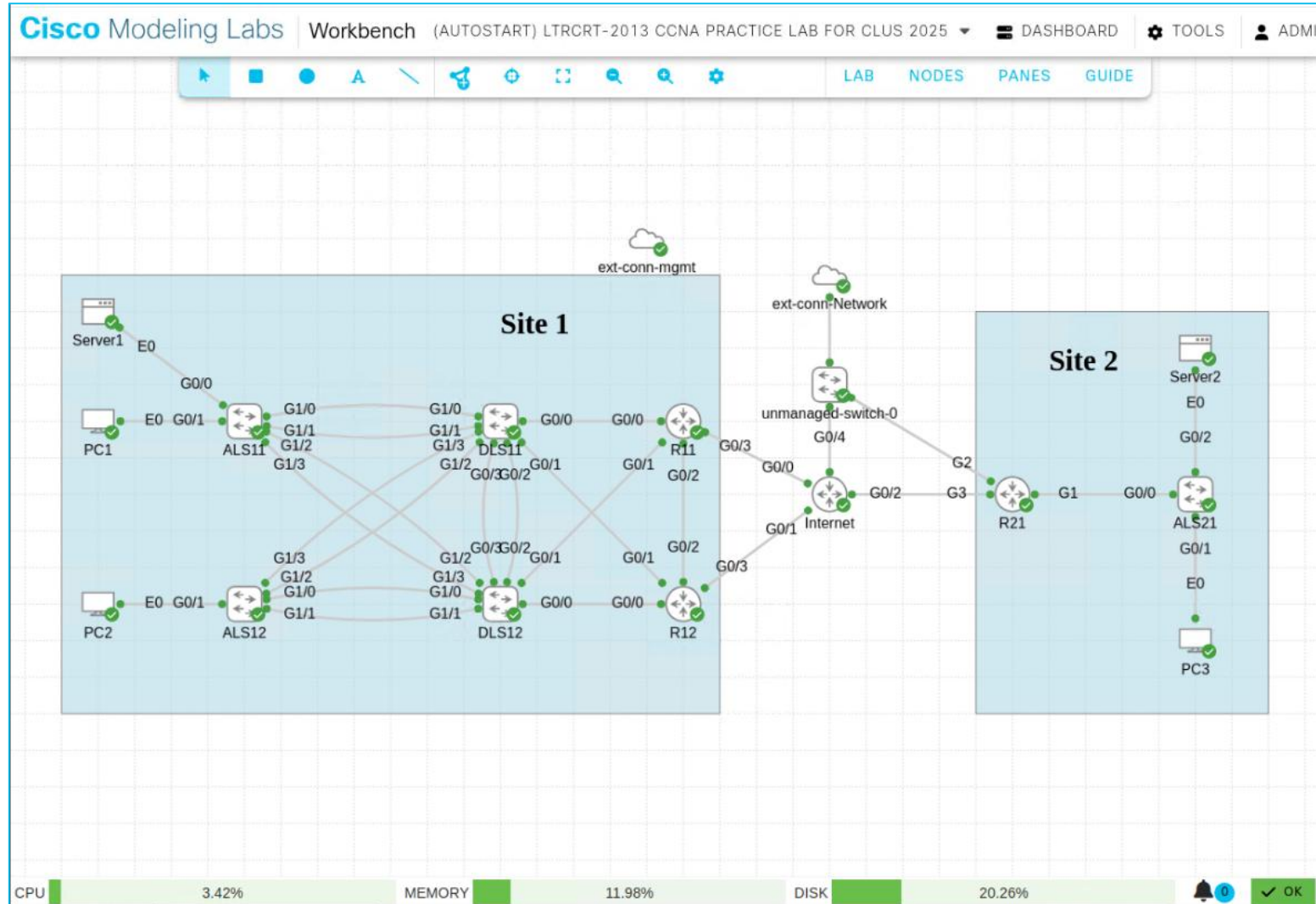
Platforms Options in Building a Lab

Option 2: Cisco Modeling Labs/CML (Network Emulation Platform)

- Released in Late 2014
- Formerly referred to as VIRL (Virtual Internet Routing Labs)
- Requires a server to run optimally (bare-metal or hypervisor)
- Utilizes actual IOS code images
- Suitable for studying all certification levels
- Consumer-Level license types:
 - CML-Free (5-node limit), \$0.00 cost
 - CML-Personal (20-node limit), \$199.00 cost
 - CML-Personal Plus (40-node limit), \$349.00 cost

Platforms Options in Building a Lab

Option 2: Cisco Modeling Labs/CML – Graphical User Interface



Platforms Options in Building a Lab

Option 2: Cisco Modeling Labs/CML - Advantages

- Provides an authentic lab experience comparable to actual devices
- Outside devices can be integrated with CML topologies
- Legally compliant way to use Cisco IOS device images
- Virtualized environment that can scale (resource dependent)
- Lower cost to deploy and operate (e.g., physical devices)
- Supports NX-OS & IOS-XR devices in addition to IOS/IOS-XE
- Supports clustering and scaling options
- Can use it for network testing and modeling (beyond cert studies)
- IOL versions included match the type of platforms that are used in Lablet exercises on the exams

Platforms Options in Building a Lab

Option 2: Cisco Modeling Labs/CML - Disadvantages

- Resource intensive (CPU/RAM/Disk)
- Some ASIC functions are not supported
- Lower licensing tiers do not support enough nodes
- No built-in topology files, samples available*
- Adding a third-party device is complex
- Larger topologies can take a while to initialize
- Limited interface support (e.g., serial)
- Unable to modify an active topology

[*https://github.com/CiscoDevNet/cml-community/tree/master/lab-topologies](https://github.com/CiscoDevNet/cml-community/tree/master/lab-topologies)

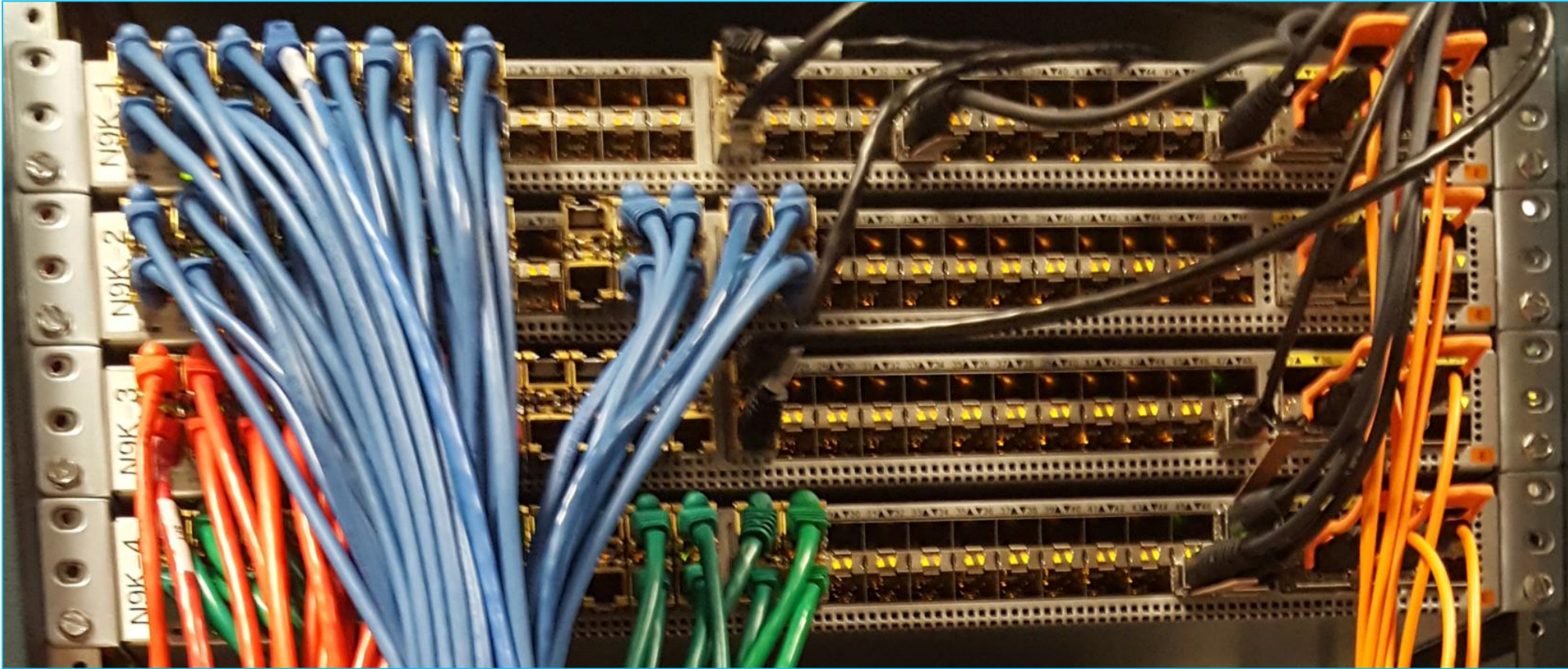
Platforms Options in Building a Lab

Option 3: Physical Cisco Equipment (“Old School” Approach)

- Originally the only way to study and test
- Utilizes physical devices networked together
- Requires space, power, and usually external access to devices
- Involves a lot of work to use:
 - **Procurement:** Purchase and shipping of equipment
 - **Deployment:** Physically installation, cabling and access
 - **Operation/Maintenance:** Software version, modules, etc.
- Subject to device failure or environmental issues

Platforms Options in Building a Lab

Option 3: Physical Cisco Equipment – Example of Racked Equipment



Platforms Options in Building a Lab

Option 3: Physical Cisco Equipment – Advantages

- Provides the single most realistic experience possible
- Feature and interface support is under your complete control
- All applicable features are available to the user
- Equipment can be obtained from many sources
 - eBay
 - Spare or retired equipment at work
 - Buy new (expensive)
- Rack rentals can also provide similar experiences

Platforms Options in Building a Lab

Option 3: Physical Cisco Equipment – Disadvantages

- Affordable equipment may not provide full feature support
- Time-consuming to deploy and/or make changes
- Fixed topology requires manual work to change
- No support (no SmartNet or TAC)
- Consumes space and power (more expensive to operate)
- May require additional purchases (such as cables)
- Inflexible
- Can be loud (especially with fans)



Which of the Following Network Simulation/Emulation Tools Would You Prefer?

Methodology For Building Lab Exercises

Methodology For Building Lab Exercises

Where to Begin?

Start With the Exam Blueprint:

- Identifies the skills measured
- Allows for focused efforts
- Avoid wasting time or effort on irrelevant topics
- Knowledge efforts map directly to command tasks:
 - Configuration
 - Verification
- Note any items not supported by your lab

Exam Description

CCNA Exam v1.1 (CCNA 200–301) is a 120-minute exam associated with the CCNA certification. This exam tests a candidate's knowledge and skills related to network fundamentals, network access, IP connectivity, IP services, security fundamentals, and automation and programmability. The course, Implementing and Administering Cisco Solutions (CCNA), helps candidates prepare for this exam.



Network Fundamentals



Network Access



IP Connectivity



IP Services



Security Fundamentals



Automation and Programmability

Expand each item below to view related exam topics.

1.0 Network Fundamentals	20%	▼
2.0 Network Access	20%	▼
3.0 IP Connectivity	25%	▼
4.0 IP Services	10%	▼
5.0 Security Fundamentals	15%	▼
6.0 Automation and Programmability	10%	▼

The above topics are likely to be included on the **200–301 CCNA v1.1** exam. The topics are subject to change at any time to reflect the latest technologies aligned to Cisco's products.

Methodology For Building Lab Exercises

CCNA 1.1 Exam Blueprint (200-301)

200-301

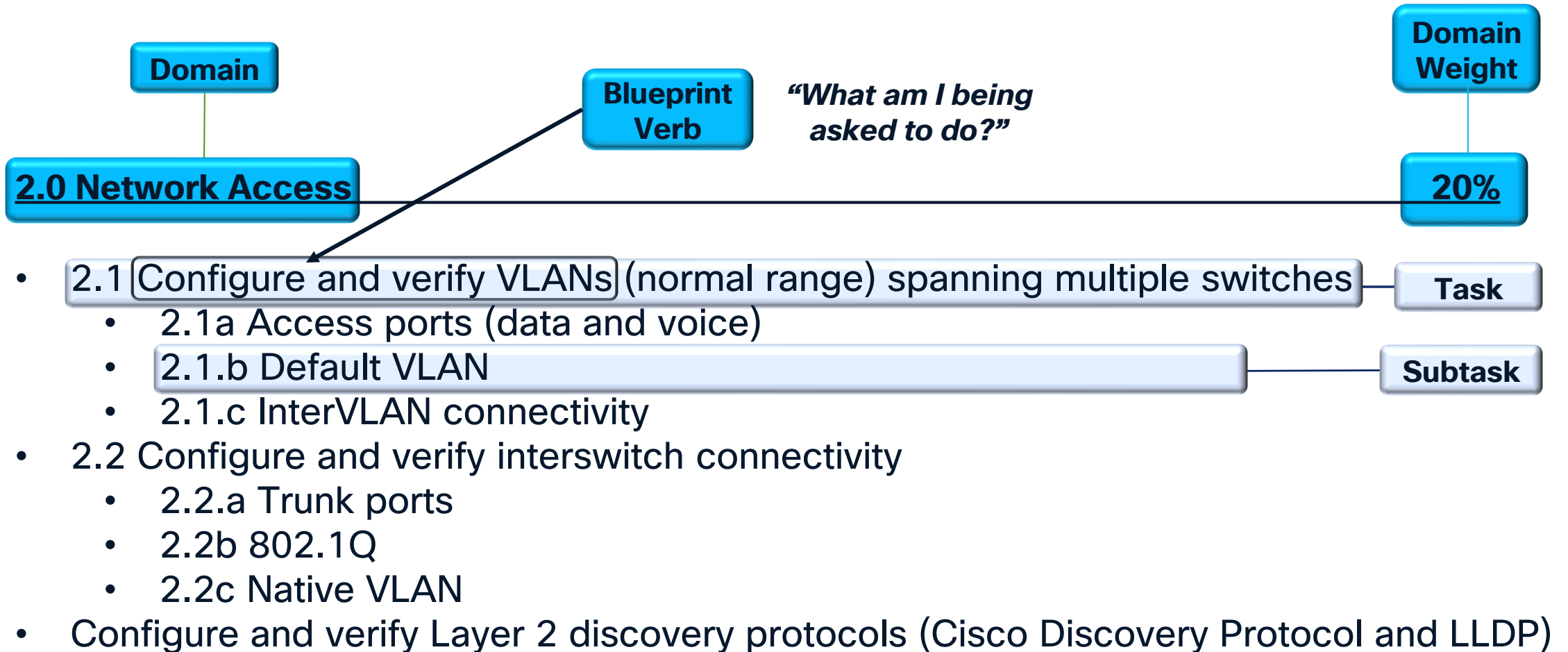
Domains/Weight

Six major areas of knowledge

- Network Fundamentals (20%)
- Network Access (20%)
- IP Connectivity (25%)
- IP Services (10%)
- Security Fundamentals (15%)
- Automation and Programmability (10%)

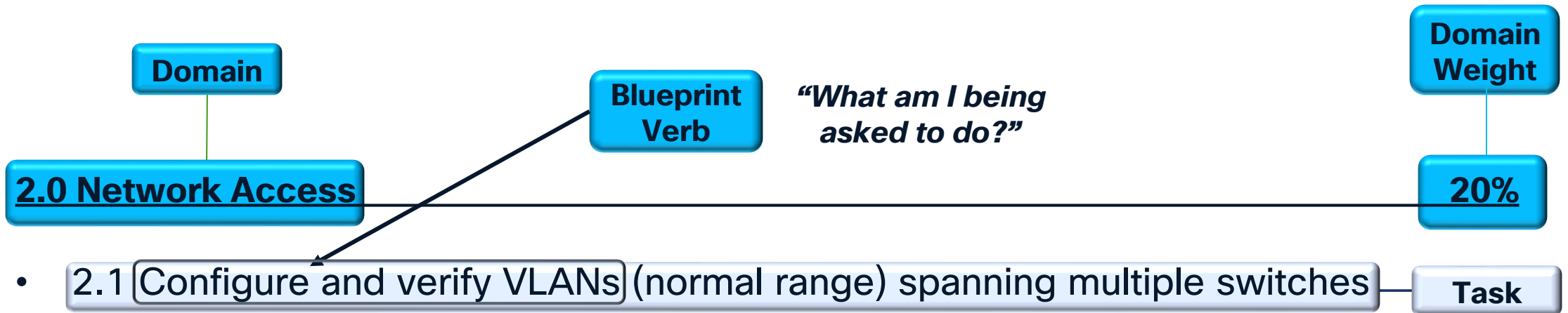
Methodology For Building Lab Exercises

CCNA 1.1 Exam Blueprint (200-301)



Methodology For Building Lab Exercises

CCNA 1.1 Exam Blueprint (200-301)



Apply/Implement

Describe/Explain

Analyze

Evaluate

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Sample Task List)

- Explicit Configuration and Verification Tasks:
- 1.6 Configure and verify IPv4 addressing and subnetting
- 1.8 Configure and verify IPv6 addressing and prefix
- 2.1 Configure and verify VLANs (normal range) spanning multiple switches
- 2.2 Configure and verify interswitch connectivity
- 2.3 Configure and verify Layer 2 discovery protocols
- 2.4 Configure and verify (Layer 2/Layer 3) EtherChannel
- 3.3 Configure and verify IPv4 and IPv6 static routing
- 3.4 Configure and verify single area OSPFv2
- 4.1 Configure and verify inside source NAT using static and pools
- 4.2 Configure and verify NTP operating in a client and server mode
- 4.6 Configure and verify DHCP client and relay
- 4.8 Configure network devices for remote access using SSH
- 5.3 Configure and verify device access control using local passwords
- 5.6 Configure and verify access control lists
- 5.7 Configure and verify Layer 2 security features
- 5.10 Configure and verify WLAN within the GUI using WPA2 PSK

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Sample Task List)

- Tasks that have possible configuration/verification operations:
- 2.5 Interpret basic operations of Rapid PVST+ Spanning Tree Protocol
- 3.5 Describe the purpose, functions, and concepts of first hop redundancy protocols
- 4.3 Explain the role of DHCP and DNS within the network
- 4.4 Explain the function of SNMP in network operations
- 4.5 Describe the use of syslog features including facilities and levels
- 4.7 Explain the forwarding per-hop behavior (PHB) for QoS, such as classification, marking, queuing, congestion, policing, and shaping
- 4.9 Describe the capabilities and functions of TFTP/FTP in the network

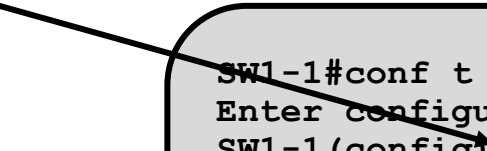
Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (Spanning-Tree Example):

2.5 Interpret basic operations of Rapid PVST+ Spanning Tree Protocol

- Configuring Spanning-Tree Settings:
 - Root bridge



```
SW1-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW1-1(config)#spanning-tree vlan 1 root primary
SW1-1(config)#interface GigabitEthernet1/0/10
SW1-1(config-if)#spanning-tree portfast
%Warning: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION
%Portfast has been configured on GigabitEthernet1/0/10 but will only
have effect when the interface is in a non-trunking mode.
SW1-1(config-if)#spanning-tree guard root
SW1-1(config-if)#
```

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (Spanning-Tree Example):

2.5 Interpret basic operations of Rapid PVST+ Spanning Tree Protocol

- Configuring Spanning-Tree Settings:

- Portfast

```
SW1-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
SW1-1(config)#spanning-tree vlan 1 root primary
SW1-1(config)#interface GigabitEthernet1/0/10
SW1-1(config-if)#spanning-tree portfast
%Warning: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION
%Portfast has been configured on GigabitEthernet1/0/10 but will only
have effect when the interface is in a non-trunking mode.
SW1-1(config-if)#spanning-tree guard root
SW1-1(config-if)#
```

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (Spanning-Tree Example):

2.5 Interpret basic operations of Rapid PVST+ Spanning Tree Protocol

- Configuring Spanning-Tree Settings:

- Root guard

```
SW1-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW1-1(config)#spanning-tree vlan 1 root primary
SW1-1(config)#interface GigabitEthernet1/0/10
SW1-1(config-if)#spanning-tree portfast
%Warning: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION
%Portfast has been configured on GigabitEthernet1/0/10 but will only
have effect when the interface is in a non-trunking mode.
SW1-1(config-if)#spanning-tree guard root
SW1-1(config-if)#
```

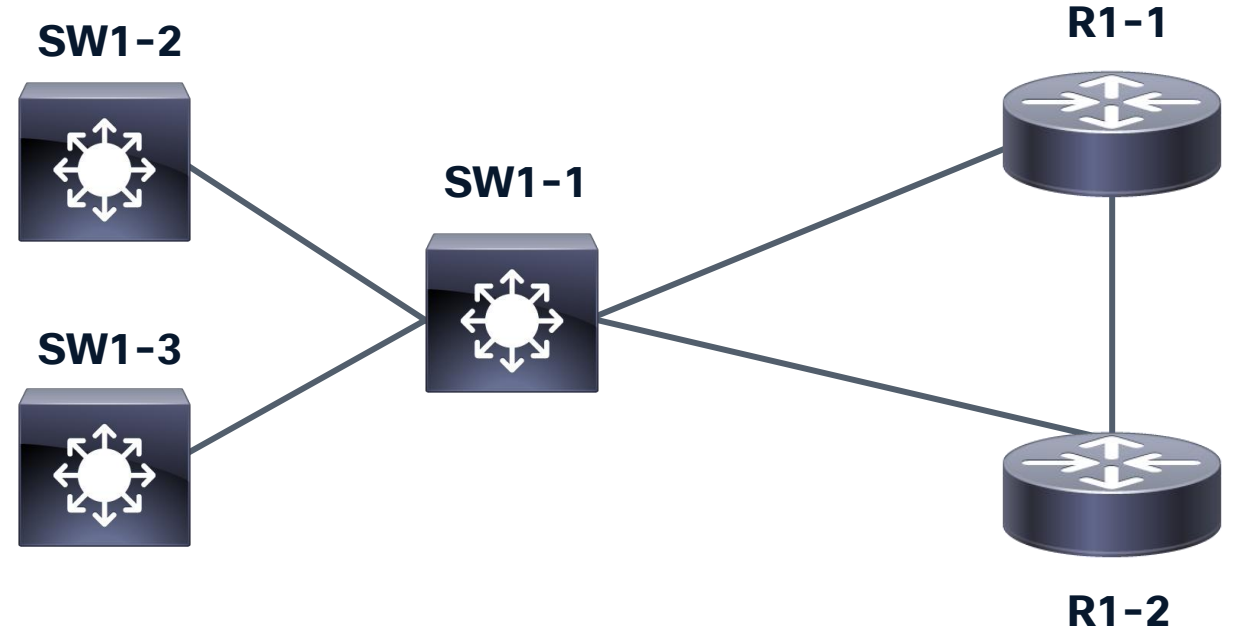
Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 Configure and verify single area OSPFv2

- OSPF Configuration Tasks:
 - Neighbor adjacencies
 - Point-to-Point
 - Broadcast (DR/BDR)
 - Router-ID



Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 **Configure** and verify single area OSPFv2

- OSPF Configuration Tasks:
 - Neighbor adjacencies
 - Point-to-Point
 - Broadcast (DR/BDR)
 - Router-ID

What is being asked/Required Here?

- Starting an OSPFv2 Process on all devices
- Configuring a Router-ID (defaults to loopback)
- Identifying interfaces between devices
- Adding the interfaces to OSPFv2
- Influencing DR/BDR Election
- Changing OSPF interface types from broadcast (if needed)

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 Configure and verify single area OSPFv2

- OSPF Configuration Tasks:
 - Routing Process
 - Router-ID
 - Neighbor adjacencies
 - Broadcast (DR/BDR)
 - Point-to-Point



**Configuration tasks
expanded and placed
in the correct
sequence**

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 **Configure** and verify single area OSPFv2

- OSPF Configuration Tasks:
 - Routing Process

```
R1-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
```

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 **Configure** and verify single area OSPFv2

- OSPF Configuration Tasks:
 - Routing Process



```
R1-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1-1(config)#router ospf 100
```

Methodology For Building Lab Exercises

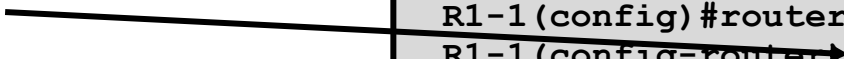
Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 **Configure** and verify single area OSPFv2

- OSPF Configuration Tasks:

- Router-ID



```
R1-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1-1(config)#router ospf 100
R1-1(config-router)#router-id 172.16.1.1
```

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 **Configure** and verify single area OSPFv2

- OSPF Configuration Tasks:

- Neighbor adjacencies

```
R1-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1-1(config)#router ospf 100
R1-1(config-router)#router-id 172.16.1.1
R1-1(config-router)#network 172.16.1.1 0.0.0.0 area 0
R1-1(config-router)#network 192.168.1.0 0.0.0.255 area 0
R1-1(config-router)#network 192.168.11.0 0.0.0.255 area 0
R1-1(config-router)#network 192.168.111.0 0.0.0.255 area 0
```

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 Configure and verify single area OSPFv2

- OSPF Configuration Tasks:

- Broadcast (DR/BDR)

```
R1-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1-1(config)#router ospf 100
R1-1(config-router)#router-id 172.16.1.1
R1-1(config-router)#network 172.16.1.1 0.0.0.0 area 0
R1-1(config-router)#network 192.168.1.0 0.0.0.0 area 0
R1-1(config-router)#network 192.168.11.0 0.0.0.0 area 0
R1-1(config-router)#network 192.168.111.0 0.0.0.0 area 0
R1-1(config-router)#interface Gigabit0/1
R1-1(config-if)#ip ospf priority 200
R1-1(config-if)#interface Gigabit0/2
R1-1(config-if)#ip ospf priority 200
```

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 **Configure** and verify single area OSPFv2

- OSPF Configuration Tasks:

- Point-to-Point

```
R1-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1-1(config)#router ospf 100
R1-1(config-router)#router-id 172.16.1.1
R1-1(config-router)#network 172.16.1.1 0.0.0.0 area 0
R1-1(config-router)#network 192.168.1.0 0.0.0.0 area 0
R1-1(config-router)#network 192.168.11.0 0.0.0.0 area 0
R1-1(config-router)#network 192.168.111.0 0.0.0.0 area 0
R1-1(config-router)#interface Gigabit0/1
R1-1(config-if)#ip ospf priority 200
R1-1(config-if)#interface Gigabit0/2
R1-1(config-if)#ip ospf priority 200
R1-1(config-if)#interface Gigabit0/3
R1-1(config-if)#ip ospf network point-to-point
```

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 Configure and verify single area OSPFv2

- OSPF Verification Tasks:



Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 Configure and **verify** single area OSPFv2

- OSPF Verification Tasks:
 - Routing Process



```
RI-1#show ip ospf
Routing Process "ospf 100" with ID 172.16.1.1
Start time: 00:00:44.112, Time elapsed: 01:14:02.266
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Link-local Signaling (LLS)
Supports area transit capability
Supports NSSA (compatible with RFC 3101)
Supports Database Exchange Summary List Optimization (RFC 5243)
Event-log enabled, Maximum number of events: 1000, Mode: cyclic
```

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 Configure and verify single area OSPFv2

- OSPF Verification Tasks:
 - Interfaces



```

R1-1#show ip ospf interface brief

```

Interface	PID	Area	IP Address/Mask	Cost	State	Nbrs	F/C
Lo0	100	0	172.16.1.1/32	1	LOOP	0/0	
Gi0/1.111	100	0	192.168.111.1/24	1	DR	0/2	
Gi0/3	100	0	192.168.12.1/30	1	BDR	1/1	
Gi0/1.11	100	0	192.168.11.11/24	1	DR	0/1	
Gi0/1.1	100	0	192.168.1.1/24	1	DR	0/1	

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 Configure and verify single area OSPFv2

- OSPF Verification Tasks:

- Neighbor adjacency

R1 show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
172.16.1.2	1	FULL/BDR	00:00:39	192.168.111.2	GigabitEthernet0/1.111
172.16.1.2	1	FULL/DR	00:00:37	192.168.12.2	GigabitEthernet0/3
172.16.1.2	1	FULL/DROTHER	00:00:39	192.168.11.12	GigabitEthernet0/1.11
172.16.1.23	1	EXSTART/BDR	00:00:13	192.168.11.23	GigabitEthernet0/1.11
172.16.1.2	1	FULL/BDR	00:00:39	192.168.1.2	GigabitEthernet0/1.1

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Examples)

How to Map to Specific Tasks (OSPF Example):

3.4 Configure and verify single area OSPFv2

- OSPF Verification Tasks:

- Received routes

```
R1-1#show ip route ospf
11.0.0.0/29 is subnetted, 1 subnets
O 11.11.11.0
  [110/2] via 192.168.111.2, 00:04:23, GigabitEthernet0/1.111
  [110/2] via 192.168.12.2, 00:30:47, GigabitEthernet0/3
  [110/2] via 192.168.11.12, 00:04:33, GigabitEthernet0/1.11
  [110/2] via 192.168.1.2, 00:04:23, GigabitEthernet0/1.1
172.16.0.0/32 is subnetted, 2 subnets
O 172.16.1.2
  [110/2] via 192.168.111.2, 00:04:23, GigabitEthernet0/1.111
  [110/2] via 192.168.12.2, 00:30:47, GigabitEthernet0/3
  [110/2] via 192.168.11.12, 00:04:33, GigabitEthernet0/1.11
  [110/2] via 192.168.1.2, 00:04:23, GigabitEthernet0/1.1
R1-1#
```

Methodology For Building Lab Exercises

Translating Blueprint Items Into Lab Tasks (Final Thoughts)

- Iterate through the blueprint until ALL possible tasks are covered
- For tasks not covered in your platform (e.g., wireless), find alternatives
- Select several off-blueprint items to change things up:
 - GRE tunneling/VPN
 - Guest shell
 - Other routing protocols
- Rework lab questions and include variations in new versions
- Get creative!

Steps to Building an Adequate Lab Topology

Steps to Building an Adequate Lab Topology

Some General Guidelines

1. Don't overdo it
 - Resist the temptation to “go big.”
 - Focus on what is required
2. Consider having multiple sites
 - Allows for site types (HQ, data center, etc.)
 - Creates practical need for subnet design
 - Enables you to deploy location-specific features (e.g., NAT)
3. Start with the essentials (you can add more later)
4. Experiment with variations to create an optimal lab design
5. Always keep the end goal in mind (preparation, not the lab itself)

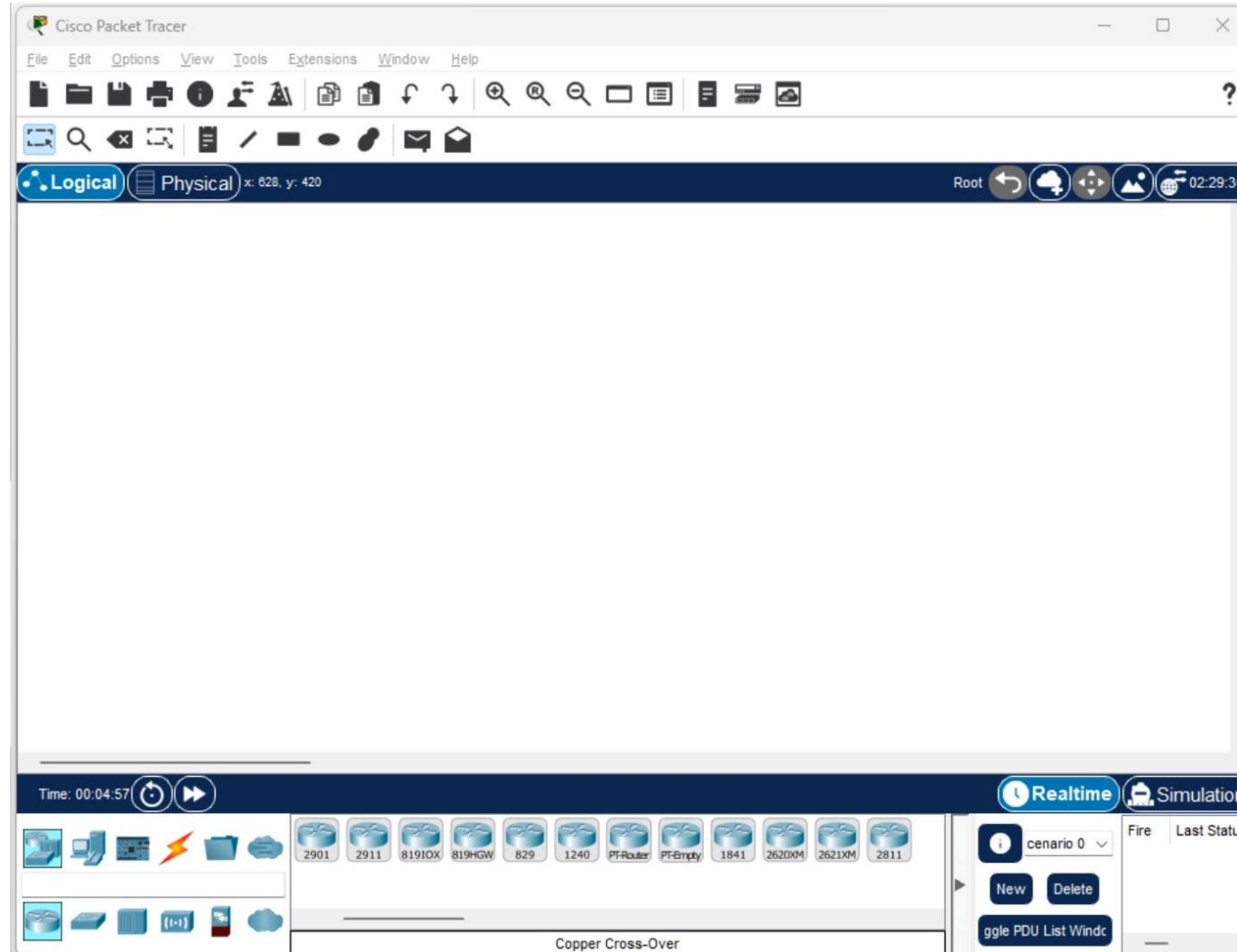
Steps to Building an Adequate Lab Topology

Step 1: Design Your Lab Environment

1. Choose the number of sites to have
2. Decide the number of devices per site
3. Be sure to allocate endpoints for testing (e.g., desktops)
4. Map out your VLAN allocations per site:
 - Management VLAN
 - Data VLAN
 - Server/Data center VLAN
5. Design IPv4/IPv6 Address Allocations
 - VLANs
 - Loopbacks
 - WAN

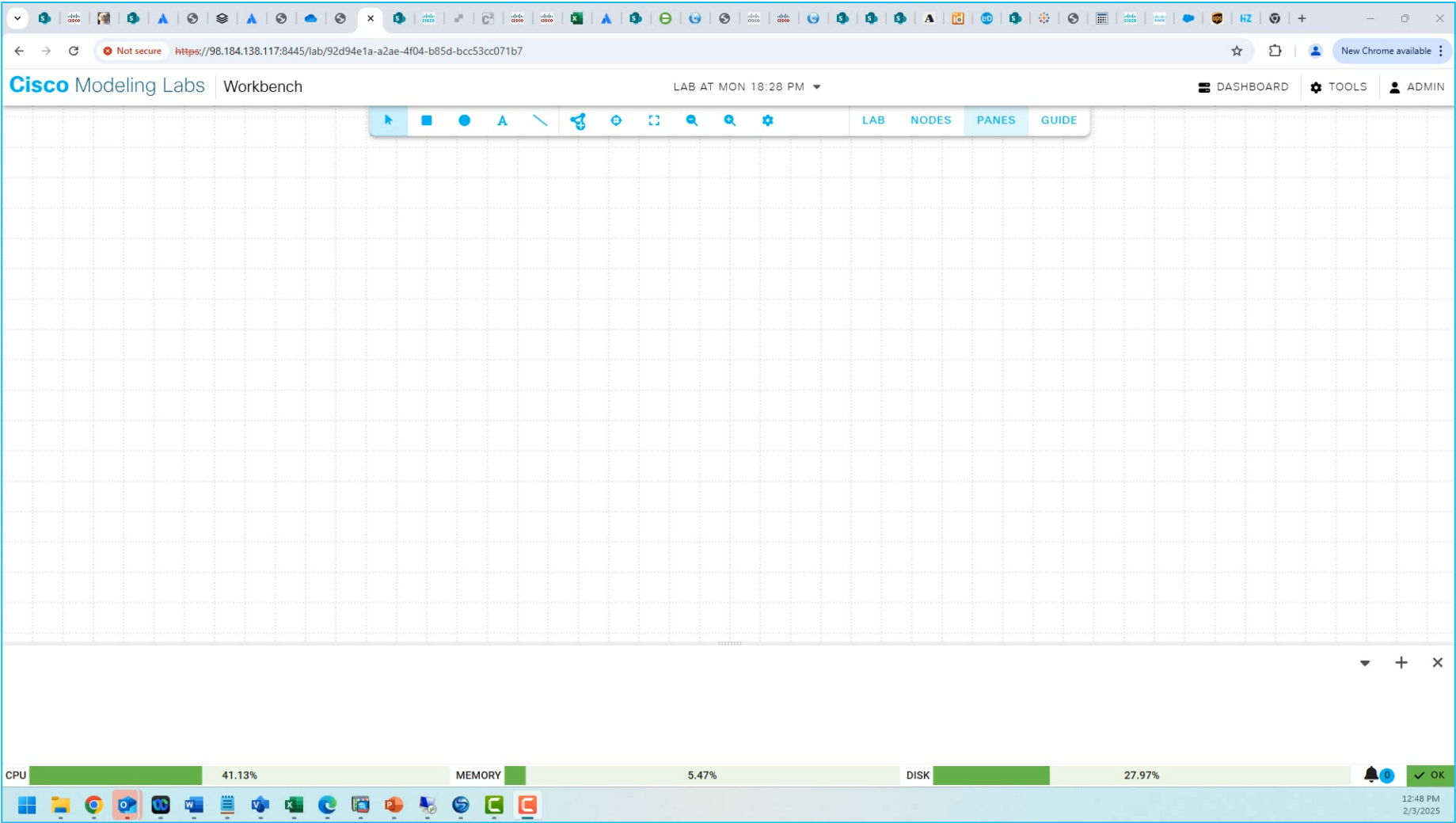
Steps to Building an Adequate Lab Topology

Step 2: Build Your Lab Environment (Packet Tracer Demo)



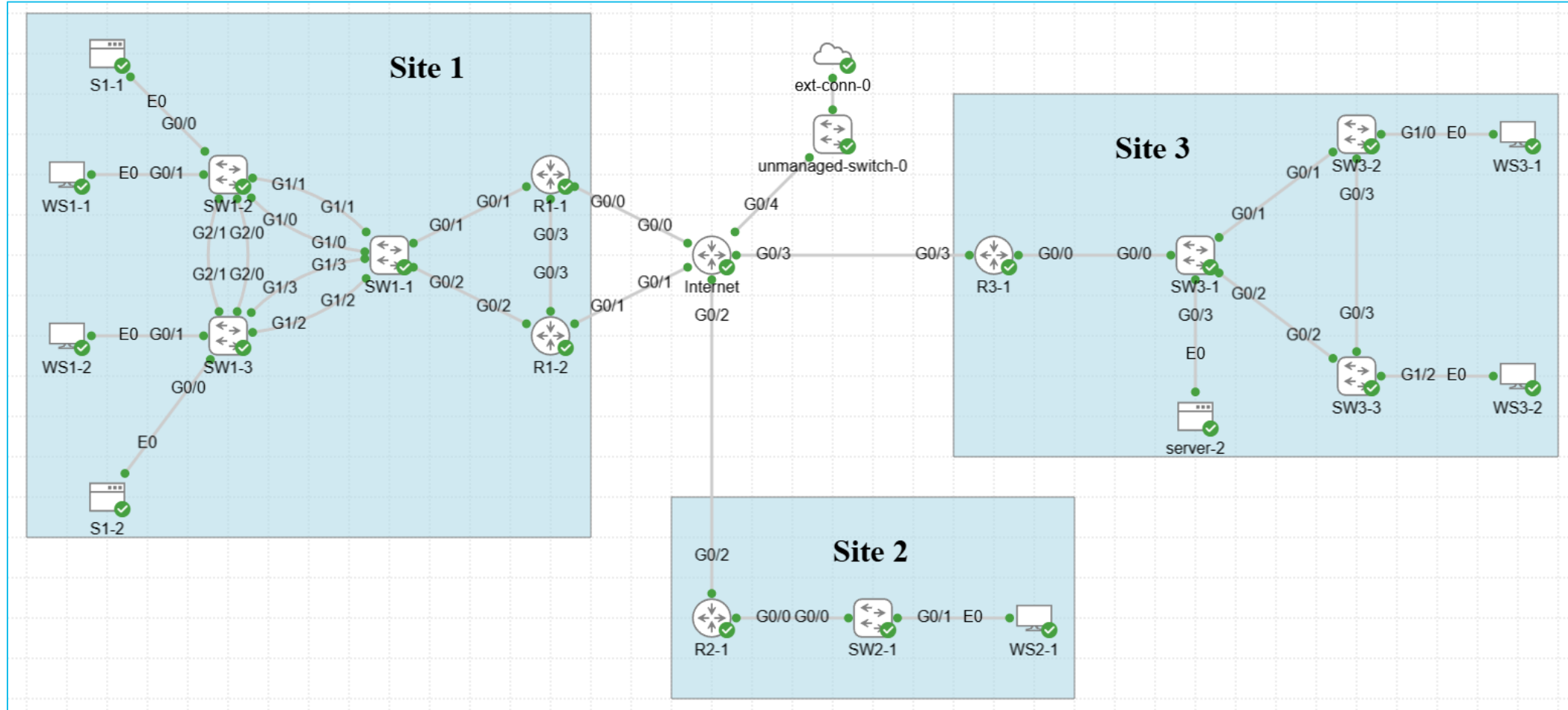
Steps to Building an Adequate Lab Topology

Step 2: Build Your Lab Environment (CML Demo)



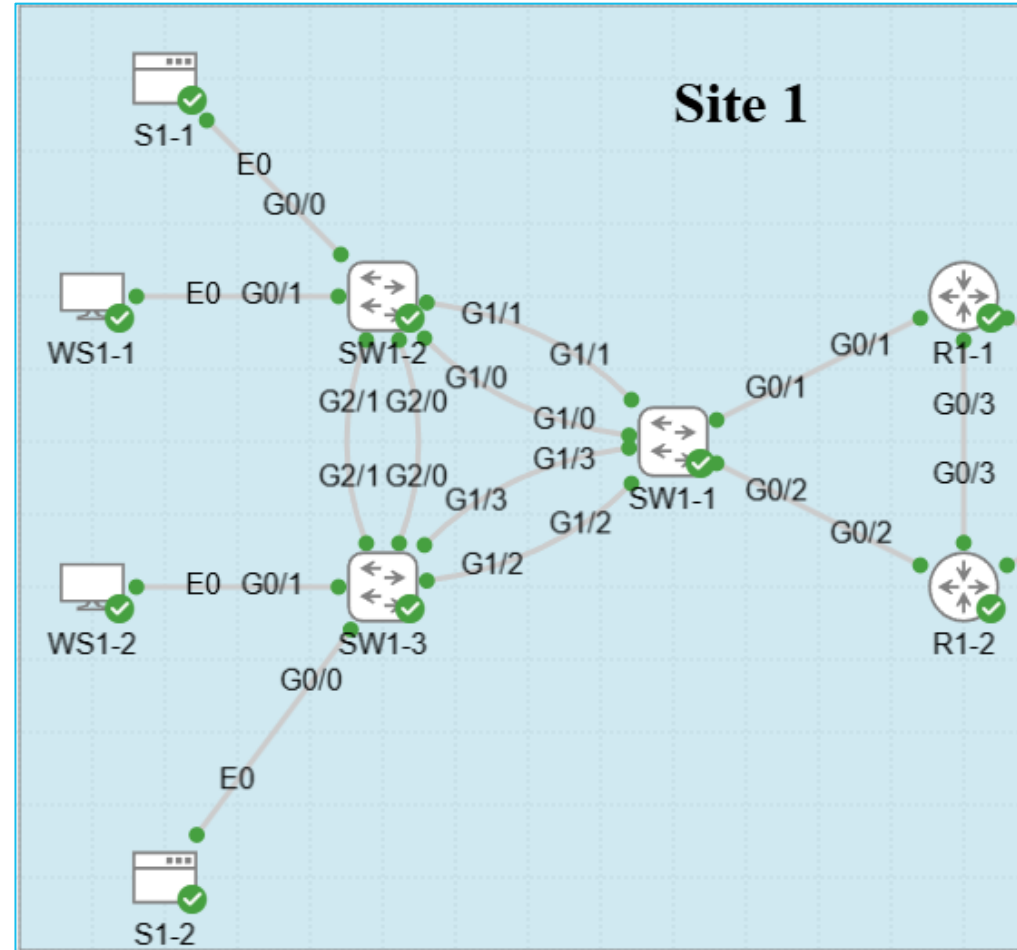
Steps to Building an Adequate Lab Topology

Sample Topology and Possible Task Mapping(s)



Steps to Building an Adequate Lab Topology

Possible Task Mappings for Site-1





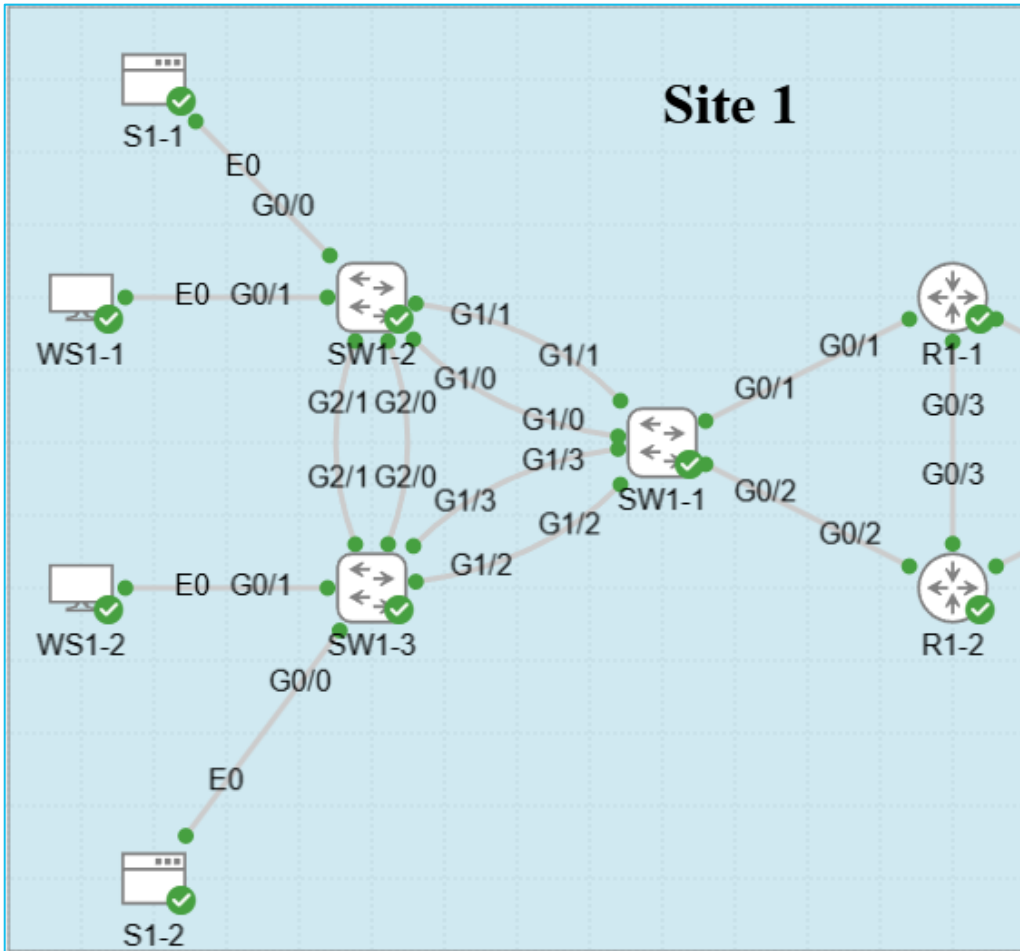
Which Layer 2 Exam Blueprint Items Would Site 1 Support?



Which Layer 3 Exam Blueprint Items Would Site 1 Support?

Steps to Building an Adequate Lab Topology

Possible Task Mappings for Site-1

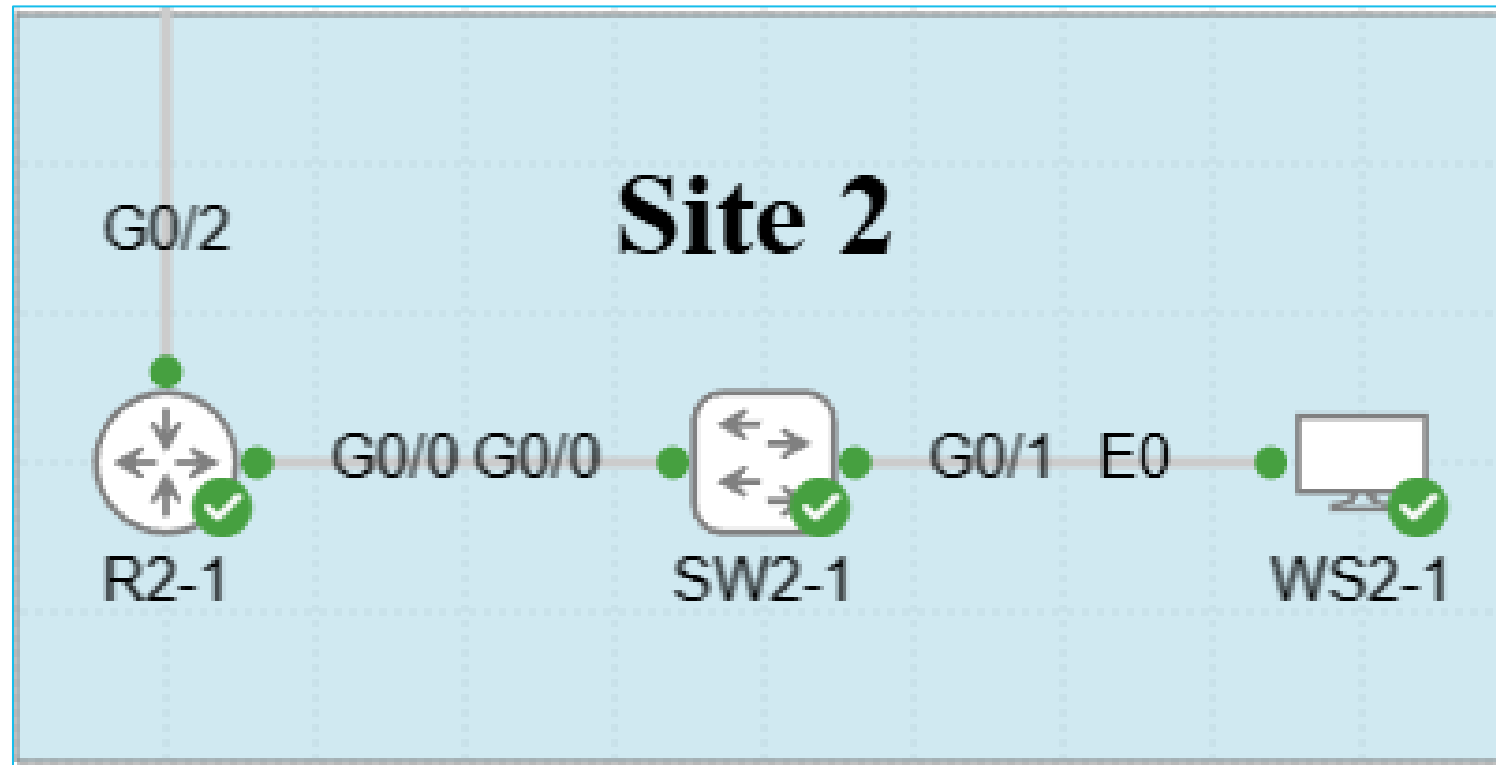


Some Task Mappings* that Would Work in **Site-1**:

1. Configure VLANs (2.1)
2. Configure/Verify OSPFv2 (3.4)
3. Configure NAT (4.1)
4. Configure NTP/DNS/DHCP (4.2, 4.3)
5. Configure/Verify EtherChannel (2.4)
6. IPv4/IPv6 Addressing/Routing (1.6, 1.8, 3.3)
7. Access Lists (5.6)

Steps to Building an Adequate Lab Topology

Possible Task Mappings for Site-2

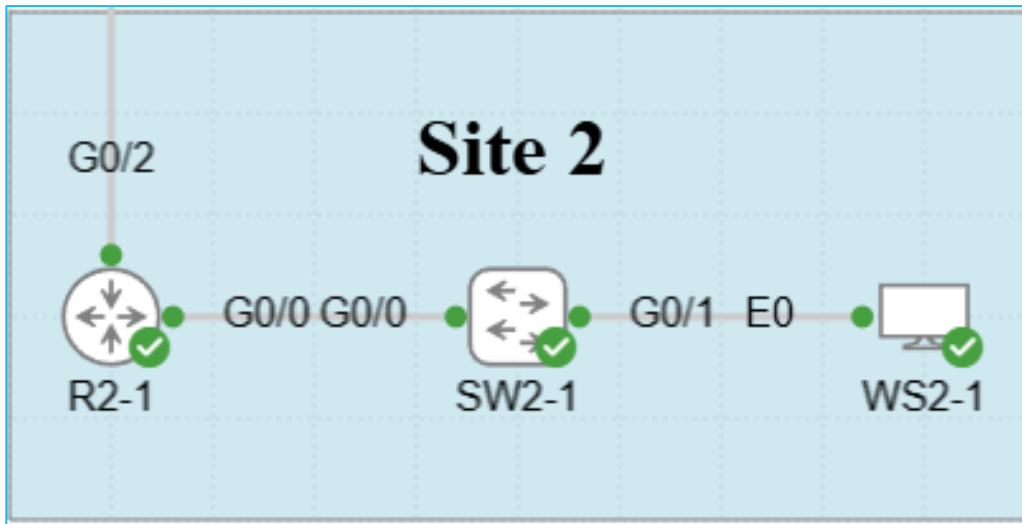




Which Exam Blueprint Items Would Site 2 Support?

Steps to Building an Adequate Lab Topology

Possible Task Mappings for Site-2

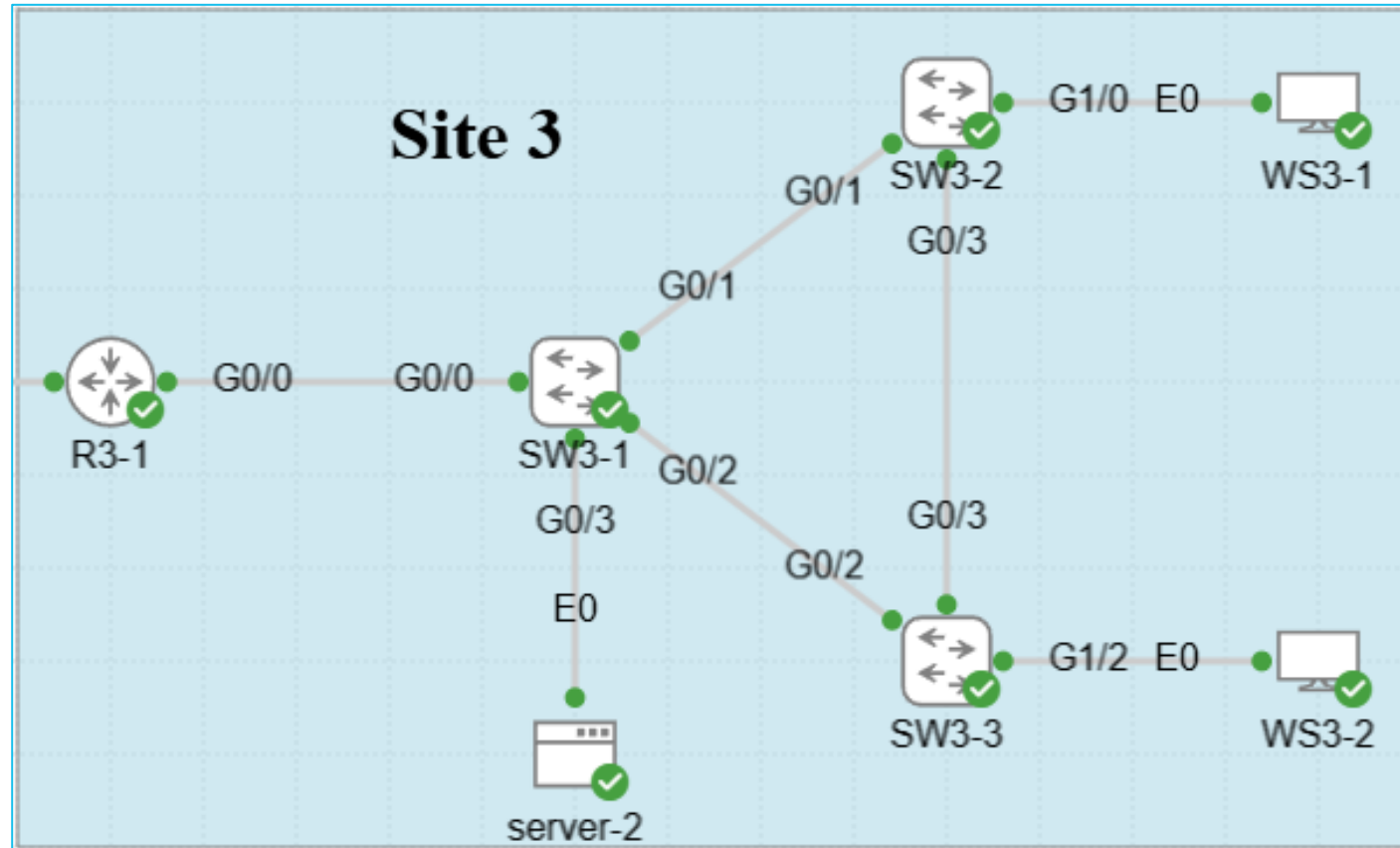


Some Task Mappings* that Would Work in **Site-2**:

1. Configure VLANs (2.1)
2. Inter-VLAN Routing/Router on a Stick (2.1.c)
3. Configure NAT/PAT/Static NAT (4.1)
4. Configure NTP/DNS/DHCP (4.2, 4.3)
5. Device Management (4.4, 4.5, 4.8, 4.9)
6. IPv4/IPv6 Addressing/Routing (1.6, 1.8, 3.3)
7. SOHO Site Type (1.2e)

Steps to Building an Adequate Lab Topology

Possible Task Mappings for Site-3

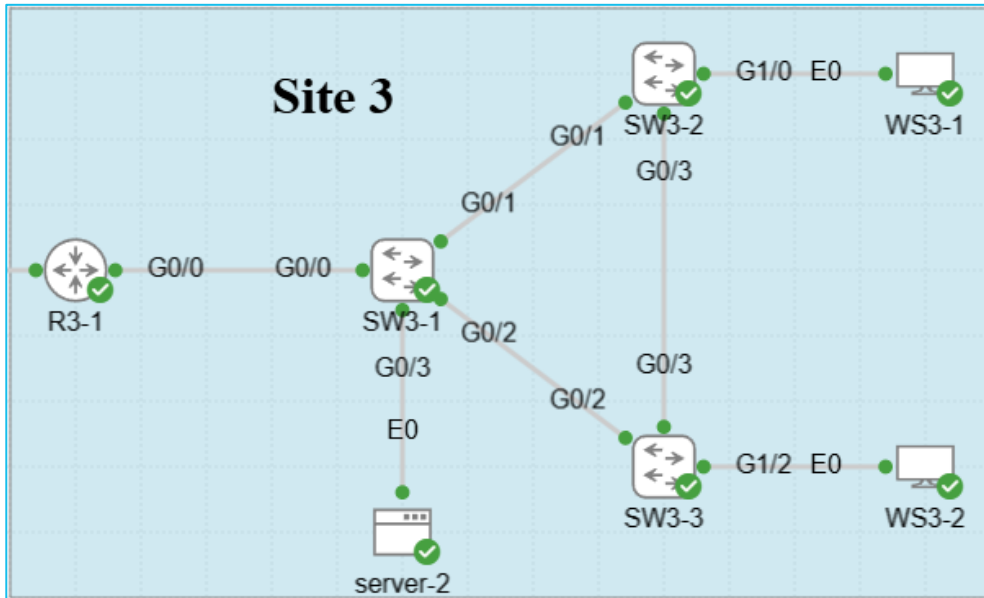




Which Exam Blueprint Items Would Site 3 Support?

Steps to Building an Adequate Lab Topology

Possible Task Mappings for Site-3



Some Task Mappings* that Would Work in **Site-3**:

1. Configure VLANs (2.1)
2. Configure/Verify Rapid PVST+ (2.5)
3. Configure Interswitch Connectivity (2.2)
4. Configure CDP/LLDP (2.3)
5. Configure NAT/PAT/Static NAT (4.1)
6. IPv4/IPv6 Routing (1.6, 1.8, 3.3)
7. Three-Tier Site Type (1.2b)
8. WAN (1.2.d)

Conclusion

Conclusion

Final Thoughts

1. Hands-on practice is a **MUST!**
2. Use practice labs to identify weak spots
3. Don't be afraid to do the same lab over several times
4. Understand the **WHY** of configuration and show commands
5. Become an expert in CLI syntax (“know them in your sleep”)
6. Avoid shortcuts because it can short-circuit genuine learning
7. Take advantage of sample labs for PT & CML (see handouts)
8. Enjoy the **JOURNEY!**

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