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CCIE Enterprise Infrastructure

Advanced Techtorial

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TECCCIE-3000

cisco Live!
Barcelona | January 27-31, 2020

Cisco Webex Teams

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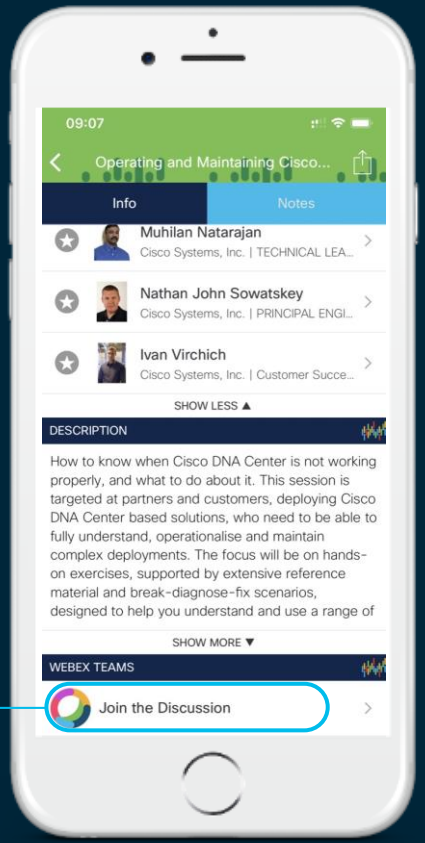
How

1. Find this session in the Cisco Events Mobile App
2. Click “Join the Discussion”
3. Install Webex Teams or go directly to the team space
4. Enter messages/questions in the team space



Updated PDF can be found here

https://cisco.box.com/s/0ktiu0sfaw6vpqy0u1nfhe2boj3tgutr

Session Abstract

This session will focus on the new CCIE Enterprise Infrastructure (CCIE EI) Practical Exam. The extensive overhaul of Cisco career certifications, including the transition of the CCIE R&S into the CCIE EI, has brought in a set of new questions and challenges for the candidates.

- How does CCIE EI compare to its predecessor, CCIE RS?
- What are the modules comprising the new Practical Exam?
- What are the rating and pass/fail rules?
- What are the new technologies covered by the EI?
- How to prepare for the EI, and how to leverage the existing RS knowledge
- What strategy to choose when sitting for the Practical Exam?

By the end of this session, an attendee will have a solid understanding of the content and structure of the new CCIE EI Practical Exam, strategies to prepare for the exam.

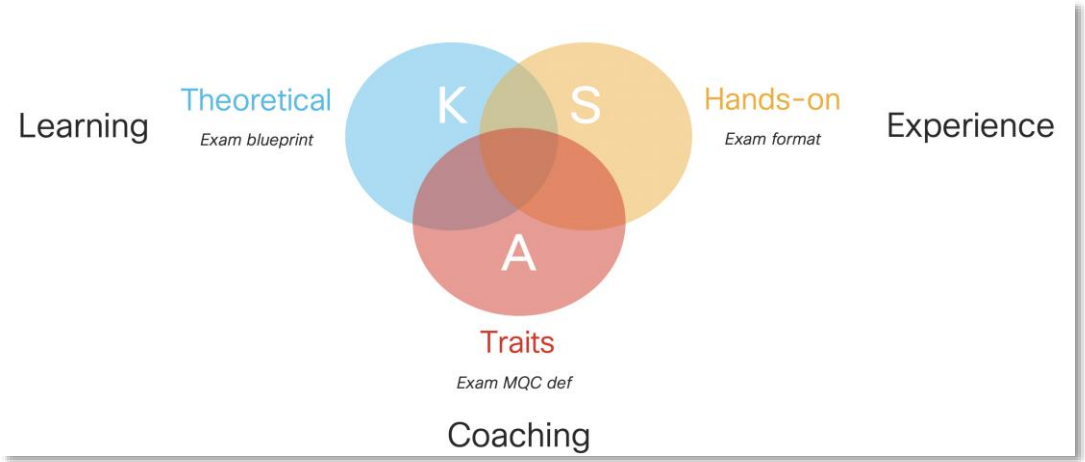
Know what you don't know

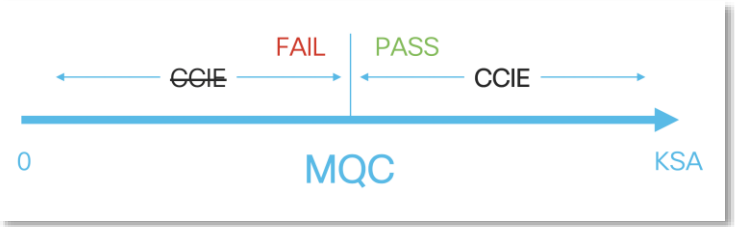
Real knowledge is to know the extent of one's ignorance

AGENDA

- Know Your Enemy
  - Overview
  - Exam Curriculum
  - Exam Design
- Plan of Attack
  - Exam Preparations
  - Exam Guidelines & Strategy
- Battlefield Tactics
  - Exam Case Studies
  - Exam Tips & Tricks

Know Your Enemy





Introducing Cisco's new certification suite

Cisco Certifications – Announced June 2019

	Associate Level	Specialist Level	Professional Level	Expert Level
Engineering				
Software				

How our program is evolving

Associate Level

Specialist Level

Professional Level

Expert Level

CISCO CERTIFIED CCNA

One Exam

CISCO CERTIFIED SPECIALIST

One Exam:
Every written proctored exam (except CCNA) = Cisco Certified Specialist

CISCO CERTIFIED DEVNET SPECIALIST

CISCO CERTIFIED CCNP

Two Exams:
1 concentration exam and 1 technology core in any order, but from the same track

Technology Core Exam	Concentration Exam
Enterprise	C C C C C
Security	C C C C C
Service Provider	C C C C C
Collaboration	C C C C C
Data Center	C C C C C

Automation and programmability cross functional course/exam option focused within technology track for CCNP certification

CISCO CERTIFIED CCIE

Lab Exam

L L	
L	
L	1 technology core and 1 CCIE lab in same track
L	
L	

CISCO CERTIFIED DEVNET Associate

One Exam

CISCO CERTIFIED DEVNET SPECIALIST

One Exam:
Every DevNet written, proctored exam (except Cisco Certified DevNet Associate) = Cisco Certified DevNet Specialist

CISCO CERTIFIED DEVNET Professional

Two Exams:
1 DevNet core and 1 concentration exam in any order, but from the DevNet track

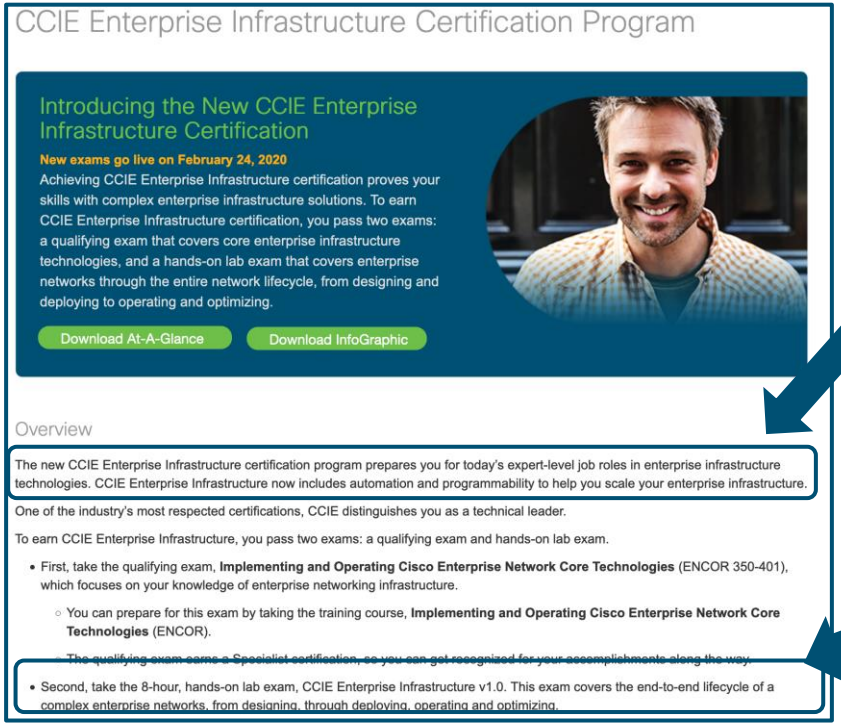
Technology Core exam	Concentration exam
DevNet	C C C C C C C C

CISCO CERTIFIED DEVNET Expert

Future Offering

Future offering

CCIE Enterprise Infrastructure



The new CCIE EI certification program

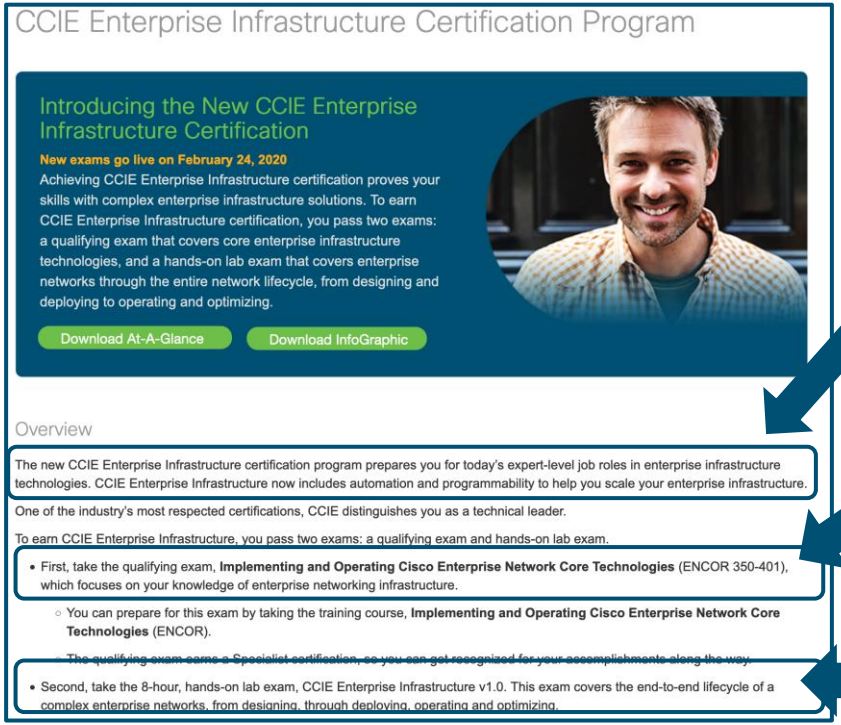
- Prepares you for today's expert-level job roles in enterprise infrastructure technologies
- Includes automation and programmability

Exam covers the end-to-end lifecycle of a complex enterprise network,

- Designing
- Deploying
- Operating
- Optimizing

https://learningnetwork.cisco.com/community/certifications/ccie-enterprise

CCIE Enterprise Infrastructure



- Today's expert-level job roles in enterprise infrastructure technologies
- Includes ***automation and programmability***

* New written qualifying exam

- *Designing*
- *Deploying*
- *Operating*
- *Optimizing*

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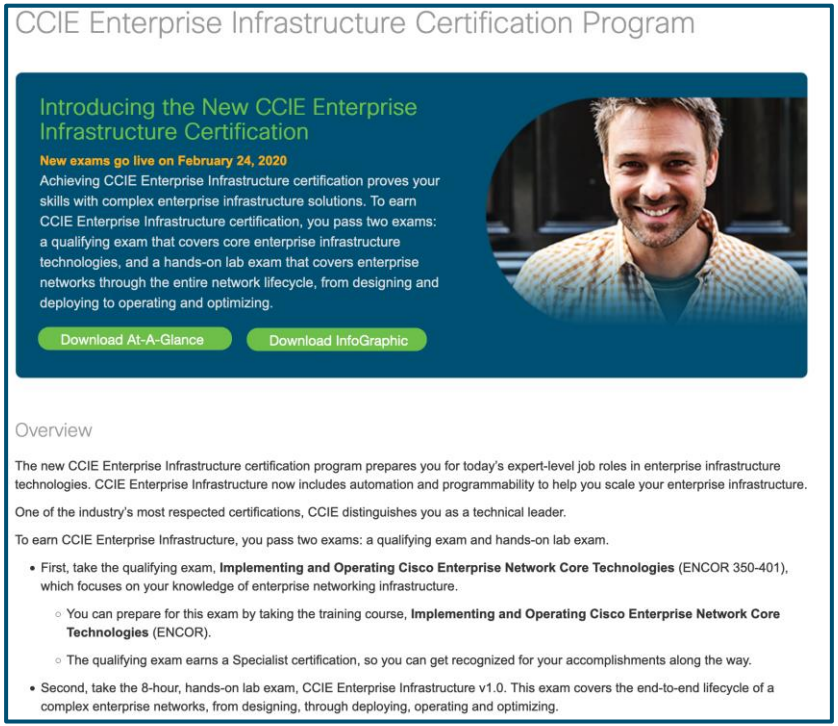
CCIE Enterprise Infrastructure



CCIE Enterprise Infrastructure Certification Program

Introducing the New CCIE Enterprise Infrastructure Certification

New exams go live on February 24, 2020

Achieving CCIE Enterprise Infrastructure certification proves your skills with complex enterprise infrastructure solutions. To earn CCIE Enterprise Infrastructure certification, you pass two exams: a qualifying exam that covers core enterprise infrastructure technologies, and a hands-on lab exam that covers enterprise networks through the entire network lifecycle, from designing and deploying to operating and optimizing.

Download At-A-Glance | Download InfoGraphic

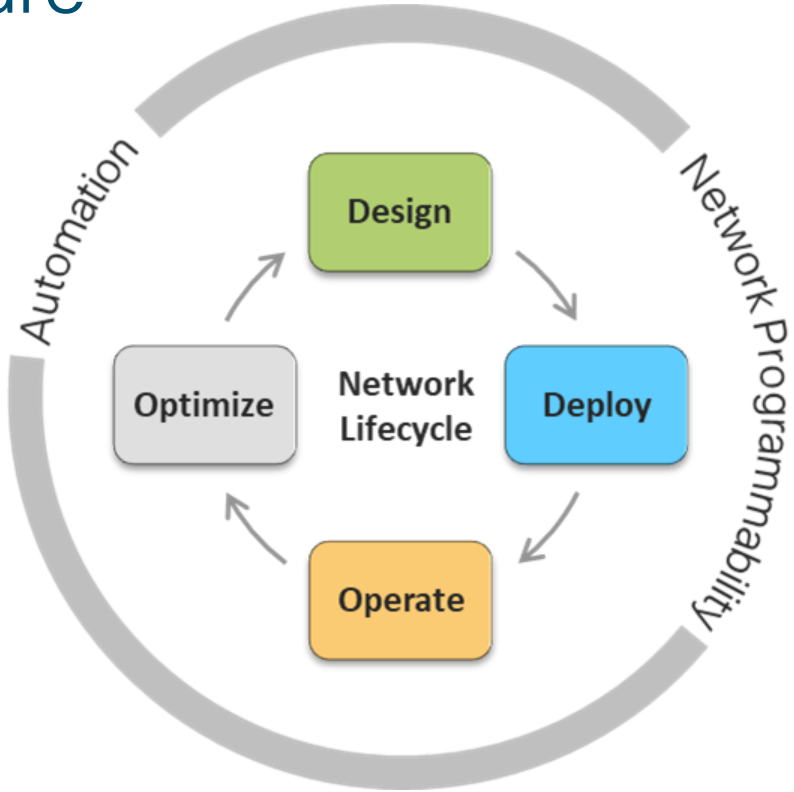
Overview

The new CCIE Enterprise Infrastructure certification program prepares you for today's expert-level job roles in enterprise infrastructure technologies. CCIE Enterprise Infrastructure now includes automation and programmability to help you scale your enterprise infrastructure.

One of the industry's most respected certifications, CCIE distinguishes you as a technical leader.

To earn CCIE Enterprise Infrastructure, you pass two exams: a qualifying exam and hands-on lab exam.

- First, take the qualifying exam, **Implementing and Operating Cisco Enterprise Network Core Technologies** (ENCOR 350-401), which focuses on your knowledge of enterprise networking infrastructure.
  - You can prepare for this exam by taking the training course, **Implementing and Operating Cisco Enterprise Network Core Technologies** (ENCOR).
  - The qualifying exam earns a Specialist certification, so you can get recognized for your accomplishments along the way.
- Second, take the 8-hour, hands-on lab exam, CCIE Enterprise Infrastructure v1.0. This exam covers the end-to-end lifecycle of a complex enterprise networks, from designing, through deploying, operating and optimizing.

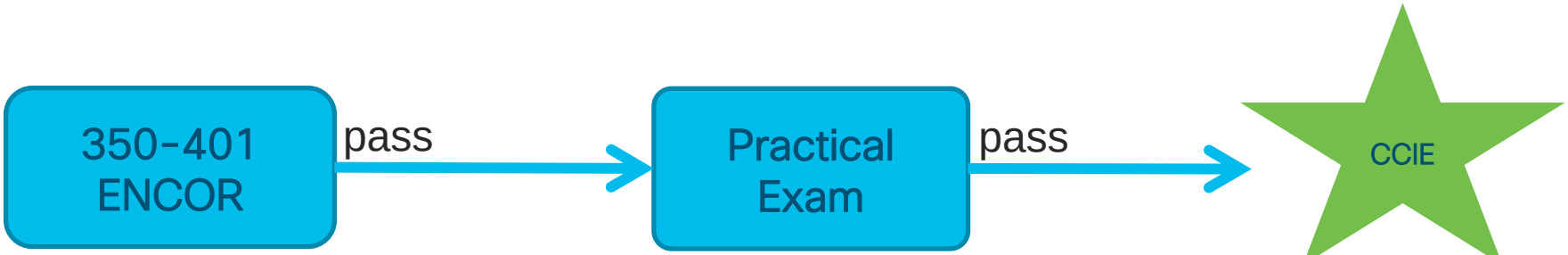


https://learningnetwork.cisco.com/community/certifications/ccie-enterprise

CCIE EI Minimally Qualified Candidate definition

- The minimally qualified Enterprise Infrastructure CCIE candidate can:
  - abstract functional elements of a complex network environment,
  - understand how infrastructure components interoperate,
  - grasp subtle issues,
  - perceive problem areas,
  - and quickly resolve problems.
- The expert's fluency makes them ideally suited for configuring and validating implementations, troubleshooting critical network issues, and participating in network design teams
- The MQC is aware of industry standards and best practices and is able to translate functional requirements into specific device configurations

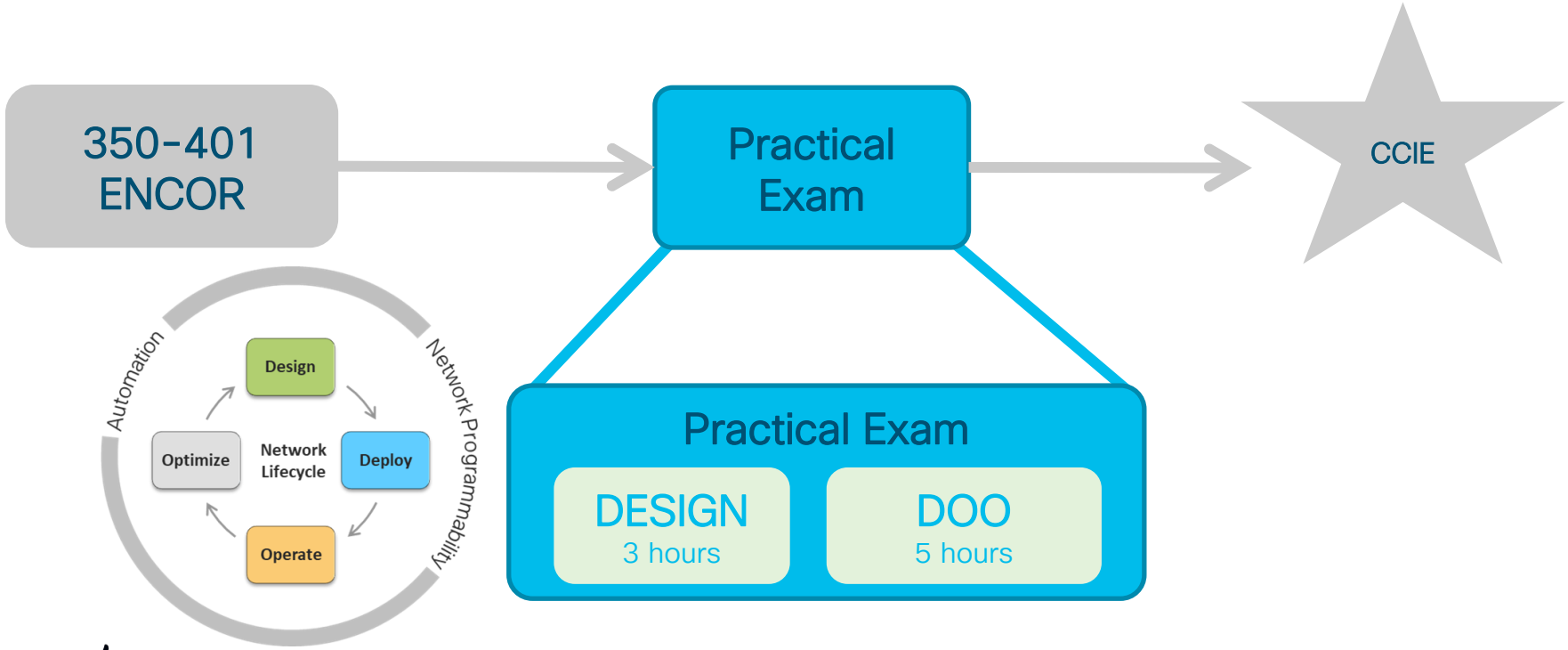
CCIE EI Certification Process



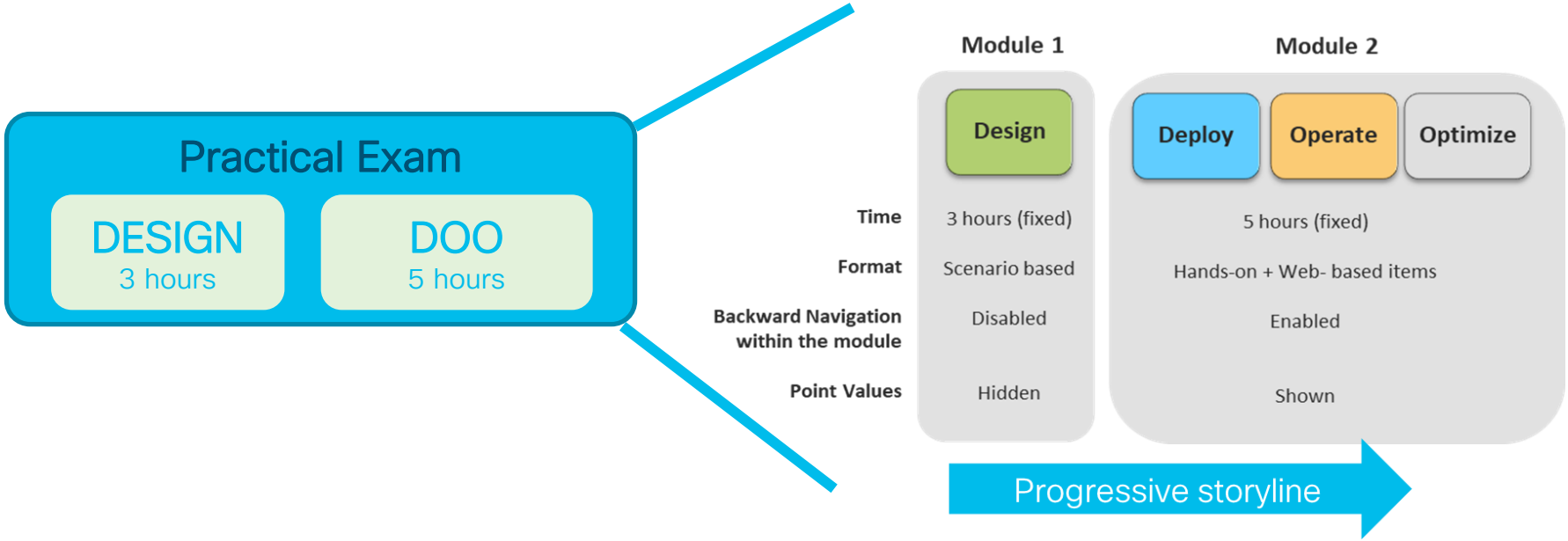
- Pearson testing centers
- 2 hours
- Multiple item types
- Web-based content
- No documentation access
- Immediately scored

- Select Cisco locations
- 8 hours
- Web-based content (Design)
- Device-based content (DOO)
- Cisco documentation
- Scored within 48h

CCIE EI Certification Process



CCIE EI Certification Process



CCIE EI Lab Skills Assessment

DESIGN

- Low level network design close to implementation
- Translate requirements into solutions
- Adapting to changes that occur
- identifying disadvantages and/org advantages of technology of choice
- Identifying boundaries of particular approach

DOO

- Abstract functional element of complex network environment
- Understand how infrastructure components interoperate
- Implement any topic on the blueprint
- Design appropriate solutions to network infrastructure's challenges within constraints and verify functionality

- Know Your Enemy
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  - Exam Tips & Tricks

CCIE Enterprise Infrastructure Curriculum

Step 1: Take the qualifying exam

350-401 ENCOR	Overview	Exam Topics	Study Material	Practice

Step 2: Take the lab exam

Lab Exam	Overview	Exam Topics	Study Material	Practice

https://learningnetwork.cisco.com/community/certifications/ccie-enterprise

CCIE EI Practical Exam Topics

CCIE EI Practical Exam		Weight
1.0	Network Infrastructure	30%
2.0	Software Defined Infrastructure	25%
3.0	Transport Technologies and Solutions	15%
4.0	Infrastructure Security and Services	15%
5.0	Infrastructure Automation and Programmability	15%

How the blueprint used to look like...

Domains > Sub-domains > Tasks > Sub-tasks

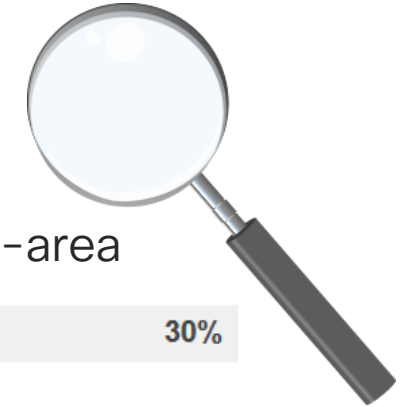
1.0 Network Principles **10%**

1.1 Network theory

- 1.1.a Describe basic software architecture differences between IOS and IOS XE
  - 1.1.a [i] Control plane and Forwarding plane
  - 1.1.a [ii] Impact to troubleshooting and performances
  - 1.1.a [iii] Excluding specific platform's architecture
- 1.1.b Identify Cisco express forwarding concepts
  - 1.1.b [i] RIB, FIB, LFIB, Adjacency table
  - 1.1.b [ii] Load balancing Hash
  - 1.1.b [iii] Polarization concept and avoidance

Action verb + Technical topic

… and how it looks now



Domains > Sub-domains > Technology area > Sub-area

1.0 Network Infrastructure **30%**

1.1 Switched campus

- 1.1.a Switch administration
  - 1.1.a i Managing MAC address table
  - 1.1.a ii Errdisable recovery
  - 1.1.a iii L2 MTU
- 1.1.b Layer 2 protocols
  - 1.1.b i CDP, LLDP
  - 1.1.b ii UDLD

No action verbs (very few exceptions) due to focus on the entire lifecycle

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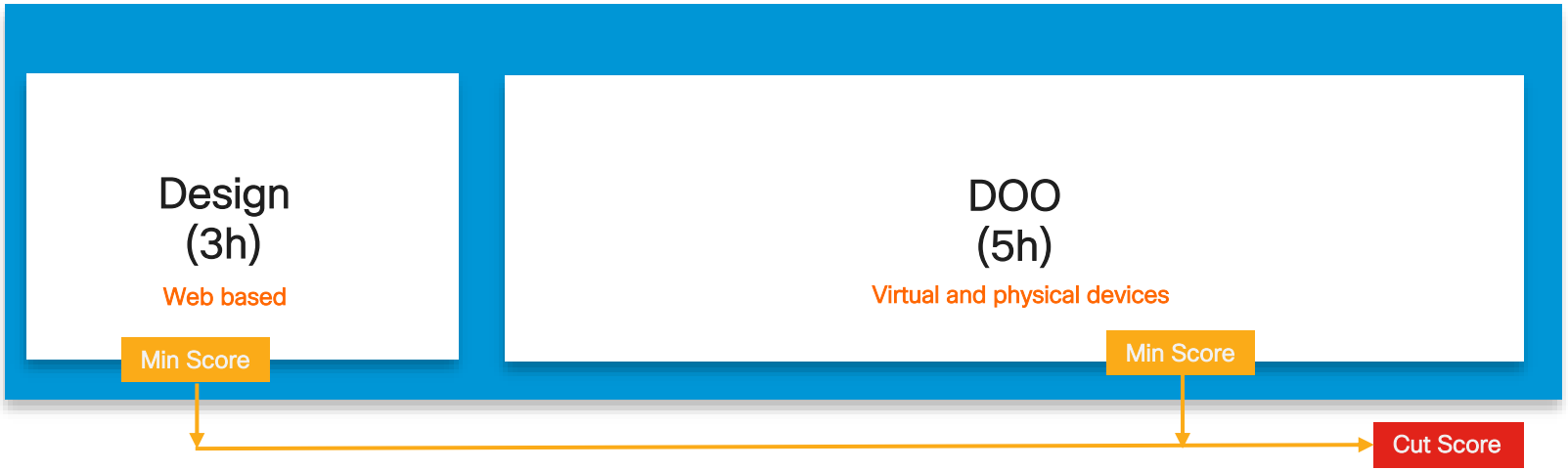
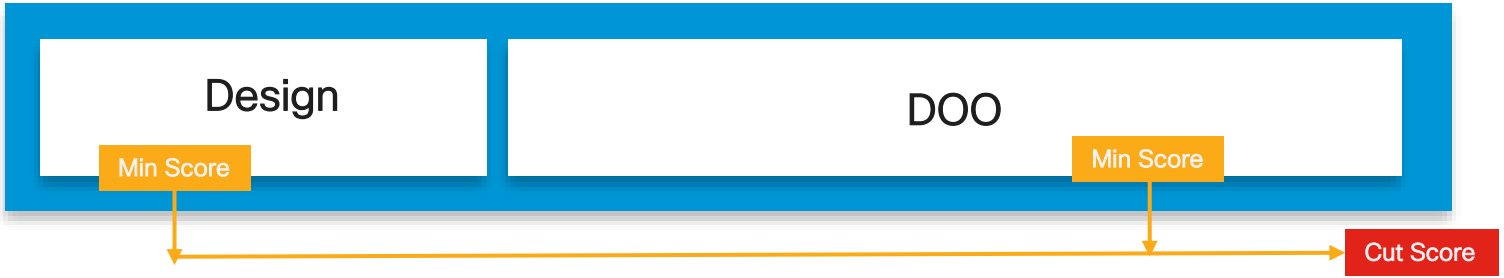
CCIE EI Lab Exam Format



Timing structure

Scoring logic

Scoring Logic



- 2 **required** conditions to PASS:
  - #1: **MUST** meet or exceed **each module's minScore**
  - #2: **MUST** meet or exceed **the Lab's TOTAL cutScore**

Min Score

Cut Score

Example#1: PASS+FAIL = FAIL

Module	Total score	Min score	Cut score
DESIGN	37	18	25
DOO	63	33	45
	100		70

Candidate 1	Score	PASS/FAIL
DESIGN	36	PASS
DOO	32	FAIL
	68	FAIL

#1: Didn't meet or exceed each module's Min score
#2: Didn't meet or exceeded the Lab's TOTAL Cut score

Min Score
Cut Score

Example#2: PASS+PASS = FAIL

Module	Total score	Min score	Cut score
DESIGN	37	18	25
DOO	63	33	45
	100		70

Candidate 2	Score	PASS/FAIL
DESIGN	23	PASS
DOO	43	PASS
	66	FAIL

#1: met or exceed each module's Min score
#2: DIDN'T meet or exceed the Lab's TOTAL Cut score

Passed all modules Min score, but total < Cut score!

Min Score
Cut Score

Example#3: PASS+PASS = PASS

Module	Total score	Min score	Cut score
DESIGN	30	18	25
DOO	10	33	45
	100		70

Candidate 3	Score	PASS/FAIL
DESIGN	26	PASS
DOO	46	PASS
	72	PASS

#1: met or exceeded each module's Min score
#2: met or exceeded the Lab's TOTAL Cut score

Min Score
Cut Score

- Know Your Enemy
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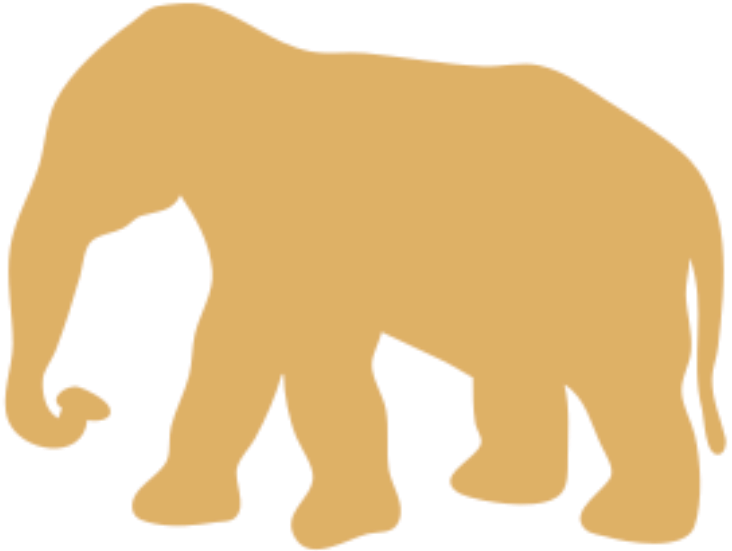
How to eat an elephant?

One bite at a time!



CCIE Exam Preparations

Expert knowledge & performance requires

ACTIVE LEARNING & DELIBERATE PRACTICE

Get started...

- Make time!
- The first few hours are the most difficult
- Study on daily basis
- Be consistent and maintain the pace
- Create the study habit...

- And... Remember Newton's First Law of motion...

“An object that is at rest will stay at rest unless an external force acts upon it”

I. Newton

CCIE EI Preparation Materials

- Cisco Learning Network (CLN)
  - https://learningnetwork.cisco.com
- Cisco Documentation
  - http://www.cisco.com/cisco/web/psa/default.html?mode=prod
- Ciscopress books
  - http://www.ciscopress.com/markets/detail.asp?st=44718
- CCIE Lab builder (Public 'Web-IOL')
  - https://learningnetworkstore.cisco.com/cisco-ccie-lab-builder

Preparation Advice

- Know Why you do it!
- Use Cisco documentation
- Remove barriers to practice
- Deconstruct the Topics
- Self Assessment
- Learn one topic at a time
- Prepare Lab Equipment
- 3x Practice … then practice for speed

Know Why you do it!

I want to become a CCIE because...

...the answer is what will keep you going in difficult times...

Use Cisco Documentation

- Main resource during DOO Module...
- Sort, don't search...
- Configuration guide and command reference

- **Bookmarks**:
  - https://www.cisco.com/c/en/us/support/all-products.html
  - https://www.cisco.com/c/en/us/support/ios-nx-os-software/ios-xe-16/tsd-products-support-series-home.html
  - https://www.cisco.com/c/en/us/support/ios-nx-os-software/ios-software-release-15-6m-t/tsd-products-support-series-home.html

Remove Barriers in Learning

- Do you have Internet access?
- Do you have a login for Cisco Learning Network?
- Do you have study materials?
- Do you have access to practice lab?
- Do you have a place to study?
- Did you allocate time in your schedule?

Deconstruct the Topics

- Turn the blueprint into a checklist

- ✓ Layer 2 Technologies
  - ✓ LAN Switching
  - ✓ L2 Multicast
- ❑ Layer 3 Technologies
  - ❑ Routing Protocols (IGP, EGP)
  - ❑ Common features
- ❑ VPN Technologies
  - ❑ DMVPN, MPLS VPN
  - ❑ Encryption
- ❑ Infrastructure Security
- ❑ Software Defined
  - ❑ SD Access
  - ❑ SD-WAN
- ❑ Automation and Programmability

Self Assessment

Know What You Don't Know

Self Assessment

Know what you don't know!

- Be honest with yourself & revisit frequently
- Assess and rate your current skills level in each topic for example:
  - I’m a star
  - I'm very comfortable
  - I'm familiar but need more hands on
  - I'm less familiar but can find it in Cisco docs
  - I don’t have any clue

Learn one Topic at a time

Slow but steady!

- Start with the core topics (switching, IGP, BGP, multicast, MPLS)
- Focus on technology/topic labs before moving to full-lab scenario!
- Gradually mix technologies together!
- Increase the pace slowly!

Prepare Lab Equipment

Choose your swiss-army knife!

- Emulator vs. real lab
  - IOL, CCIE Lab builder, Cisco Learning Labs, VIRL, Dynamips
- Home lab vs. rental lab
- Combination between emulator vs. real lab

Cisco is looking into offering a Lab Bundle for Software Defined Technologies

Practice, Practice & Practice!

Build confidence first...

- Better to be stuck in one full lab scenario than looking at the answer
- Try to find the answer on your own!
  - Further research on the topic
  - Use debug and show commands
  - Try and test possible config solutions
- Focus on Quality!!!! Not quantity!!!!
- Invent, ask ”What if?”
  - Do not restrict your study to the courseware! Explore, try, create new scenario!

The Untold...

Knowledge test vs Performance test

Deliberate Practice

- Practice on what you don't master yet!
  - Put yourself out of your comfort zone!
- Spend time, lots of time, but practice with purpose, not just muscle!
- Focus on tiny improvements! Get 1% better every day/week!
  - Master one skill at a time! Get feedback! Set measurable goals!
- Repeat and work on techniques to improve performance (i.e. speed!)
  - Put in your full attention!

Deliberate Practice Strategy

- Do I really understand the fundamentals?
  - Don’t lose sight on the fundamentals
- Am I working on the next step?
  - Build cumulative skills!
- What am I missing? What is new? How can I grow?
  - Expertise is a process, not a race!

Practice for speed

...then work on performance!

- Target max 5h to resolve a practice lab
  - Learn and use IOS shortcuts (shortest CLI, alias, config)#do ..., etc)
  - Use plain text editor to build config snippets and copy/paste identical
  - Establish your method and strategy with speed in mind

Practice for Troubleshooting
Even for CCIE EI!

Build your Root-Cause-Analysis process

- Ask someone to introduce problems to a known lab
  - Focus on the troubleshooting methodology and speed will come naturally
  - Know how (which CLI!) to verify states vs configs!
  - Isolate the issue in OSI layer, protocol/feature, device(s), interface(s), …
  - Work from destination when applicable
  - Keep asking “What IS and What IS NOT working?” & “What if?”
  - Use debugs!

Final Preparation

- Book your exam when you feel confident…
- Anticipate the D-day!
- Review the Tips & Tricks… ☺
- Mentally picture yourself as a CCIE! ☺

And…

Remember the Universal Law of Attraction…

Whether you think you can,
or you think you can't... **you're right!**

Henry Ford

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Exam Guidelines

CLICK HERE TO START - Background Info

- What are the rules with the content?
- Do’s and Don’t
- Available anytime within the exam UI

Lab Exam Guidelines

- General recommendations
- Timing
- Scoring
- Inter-dependency
- Prohibited solutions
- Devices

Lab Exam Guidelines

General recommendations

- Read all items before starting
- Verify initial configurations
- Required exhibits aren’t always sufficient
- Manage your time
- Pay attention to details

DESIGN Exam Guidelines

Specific to Design module

- Play the role of a design engineer
- Read the whole story and background information
- Select as many options as requested
- Keep in mind of partial scoring on item level

DOO Exam Guidelines

Specific to DOO module

- Read all items and **understand the overall scenario**.
- The overall scenario targets full reachability between all sites, unless specified.
- **Points are awarded per item if the solution meets all requirements.**
- There are many valid solutions, grading is based on outcome.
- Do not use static route and redistributions **unless explicitly requested to**.
- Do not change IP addressing or routing protocols boundaries.
- Do not add interfaces unless specified.
- Plan for regression tests after completed substantial changes.

Lab Exam Strategy

Did you drive the same way on your driving license test compared to how you drive in real life?

Lab Exam Strategy

"Just"…

PASS it!

Overall Lab Exam Strategy

"Just" PASS it!

- Target 80% in all modules, not 100%
  Don't try to ace it
- Use the Scoring logic
  Don't give up after Design
- Manage your time
- Pay attention to details
  Don't just do & move on, (anticipate & verify too)

Exam Strategy: Manage your time!

Do not get stuck!

- Set time limit per item
- Use your watch or workstation' clock
- Monitor the session's count-down timer
- STOP and move on to the next item
- Keep a note… and get back to it later…
- Use prohibited solution if needed…
- Troubleshoot before asking help to the proctor

Exam Strategy: Pay attention to the detail!

Do not assume!

- Read items multiple times
- Consult diagrams! (authoritative reference)
- Think, anticipate and plan before doing
- Beware of typos!
- Use plain text editor + copy/paste to author config snippets
- Verify states, not configuration
- Re-read item when completed, check for anything missing

Read, Think, Anticipate, Do, Verify, Re-read, Re-verify!

Exam Strategy: Control your stress!

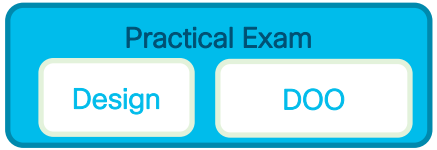
Build your confidence level!

- Relax!
- Scan read and cherry pick items!
- Take the low-hanging fruits! (Collect the ‘easy’ points first!)
- Use plain text editor to speed up configs!
- Rely on the documentation!
- Keep notes of overall progress.

Overall Strategy for each Exam Module

Design: Don't Panic!

DOO: Make your choice!



We'll develop tactics and illustrate with demos for each module

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Exam Case Studies

- Lab Exam Web GUI
- DESIGN
- DOO

CCIE 2.0: Lab Structure

8h Lab

Design

- Progressive storyline (no back nav)
- Only web items
- No access to device
- Fixed 3h (min/max time)
- Min + Cut Score
- Partial scoring
- Score value hidden
- Include automation & programmability

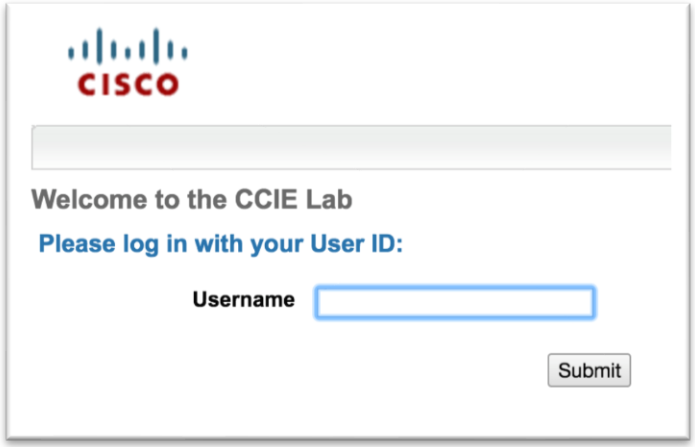
DOO

- Hybrid CFG + TS
- Virtual Devices along with live devices
- Fixed 5h (min/max time)
- Min + Cut Score
- Score value visible
- No partial scoring
- Include automation & programmability

Progressive Story Line

Lab Exam Environment

- 100% Web-based
- No printed workbook
- Dual-monitor
- Qwerty keyboard
- Linux Based VDI
- Terminal Emulator
- Color pens + Scratch paper



User Interface Overview

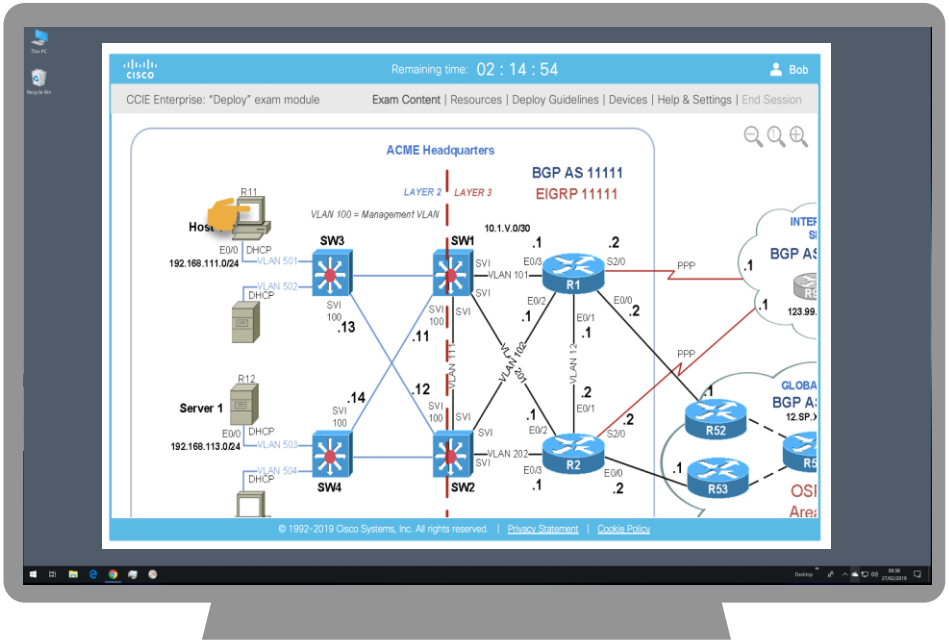
Content popup

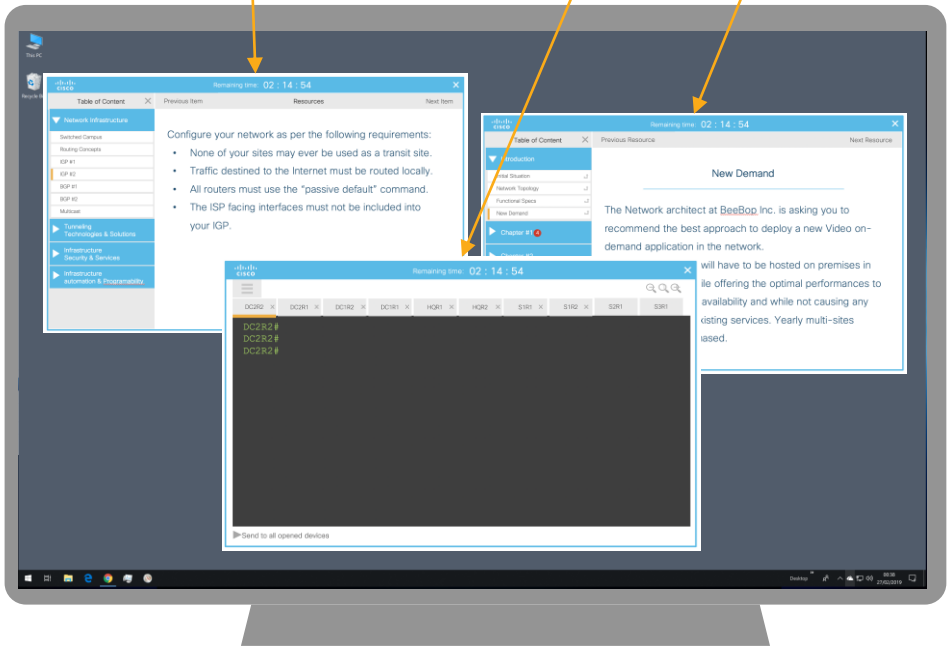
Resources popup

Devices popup

Monitor 1

Monitor 2



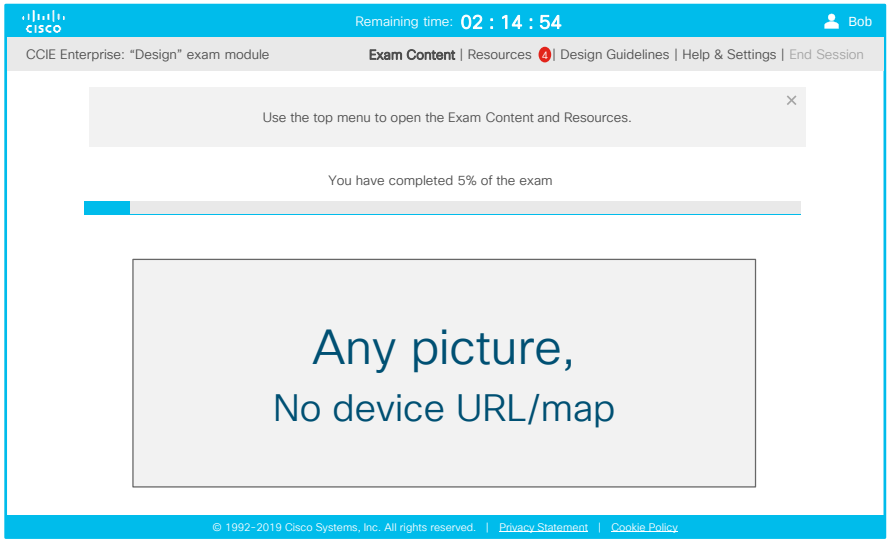


Main page

3x popups

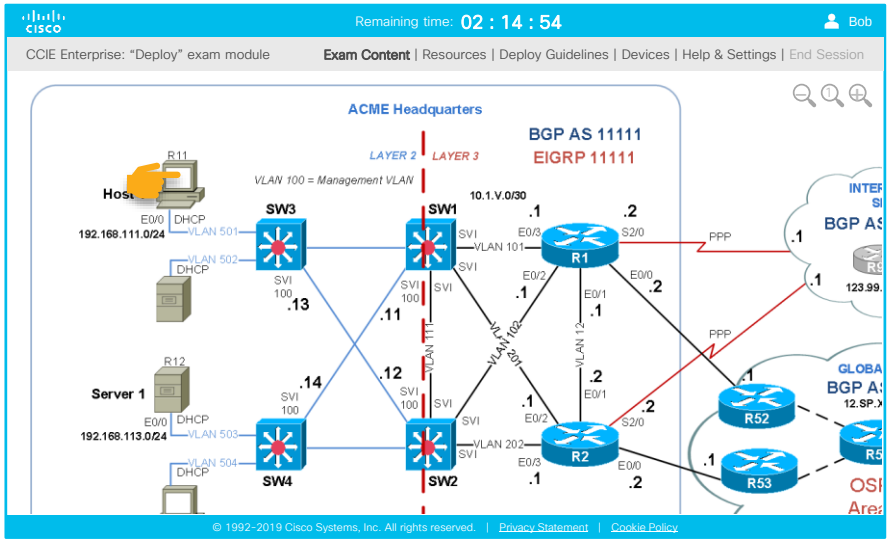
User Interface Main page

Design module



- Always visible countdown timer
- "End Session" disabled until minimum time reached

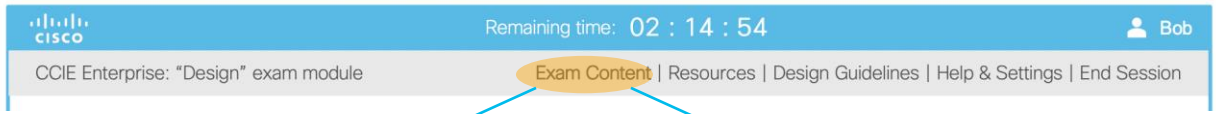
DOO module



- Main topology diagram
- Clickable icons
- Always visible countdown timer
- "End Session" disabled until minimum time reached
- Zoom in/out/fit-in buttons when mouse-over the diagram

User Interface Content popup

From Main page



Design module

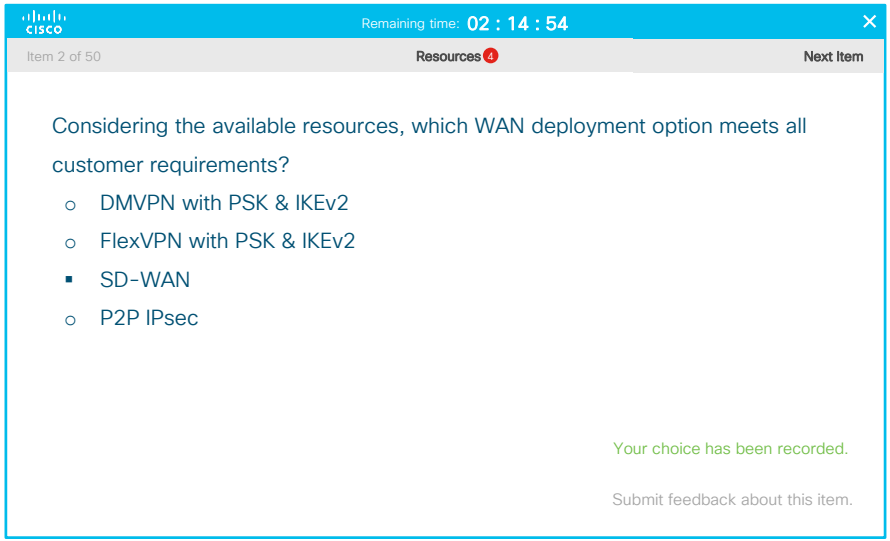
- Only Web-items
- No backward navigation
- Score hidden

DOO module

- Device-items
- Backward navigation
- Table of Contents
- Score shown

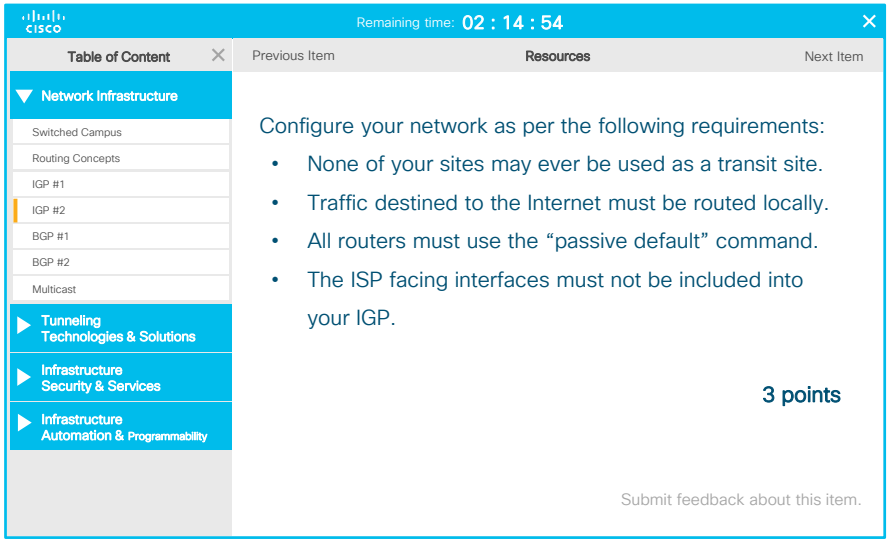
User Interface Content popup

Design module



- Always visible countdown timer
- Visual indicator for newly available Resource(s)
- Progress indicator
- Score is hidden

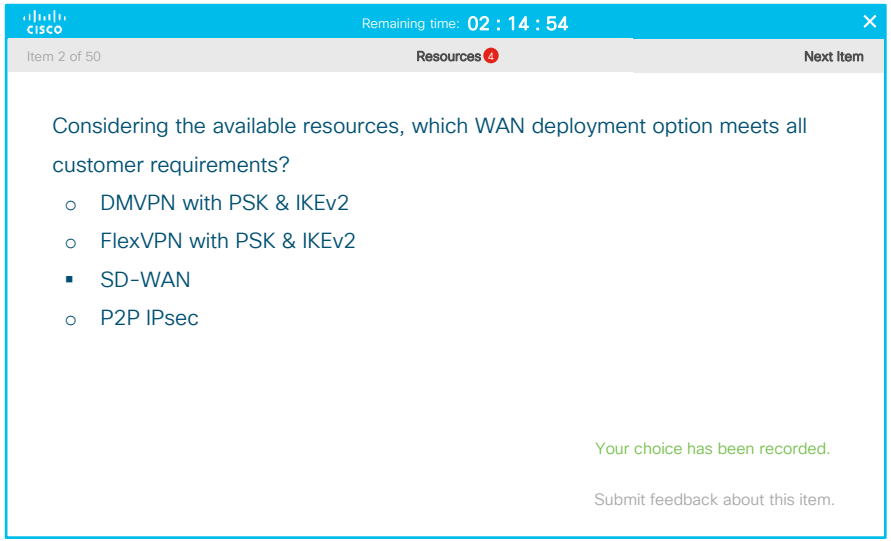
DOO module



- Always visible countdown timer
- Collapsible table of contents
- No progress indicator
- Score is visible

User Interface Design

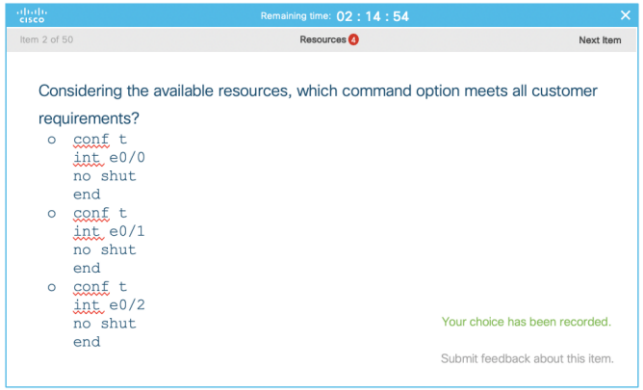
Design module

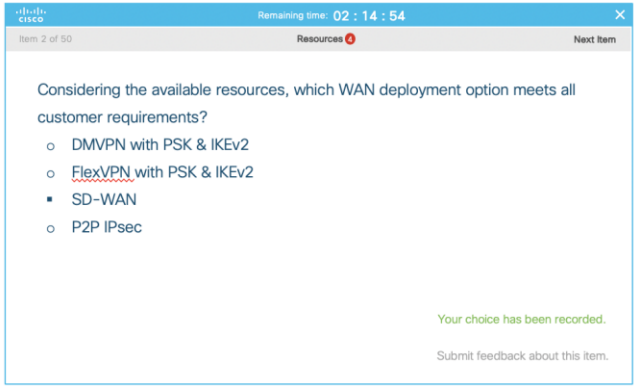


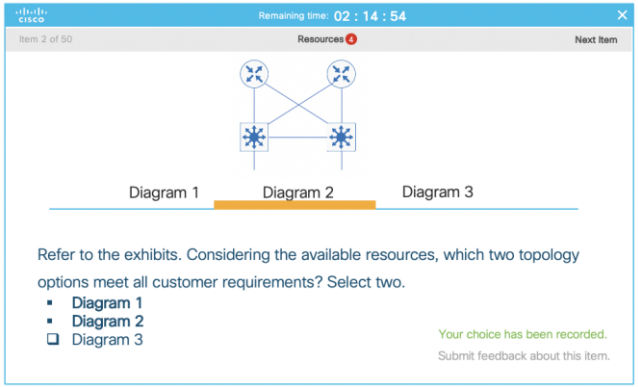
Web Item Types

- **MCxA** (simple, HTML, Tabbed)
  where MCxA = MCSA + MCMA
- **Drag and Drop** (simple, category, graphical)
- **Dropdown** (simple, row, range)
- **Hotspot** (MCSA)
- **Matrix** (MCSA, MCMA)

Multiple Choice







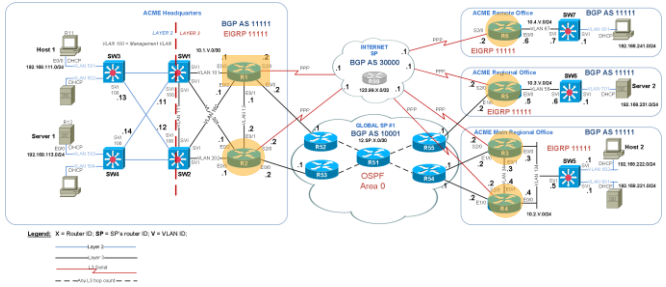
Hotspot

Hotspot

Remaining time: 02 : 14 : 54

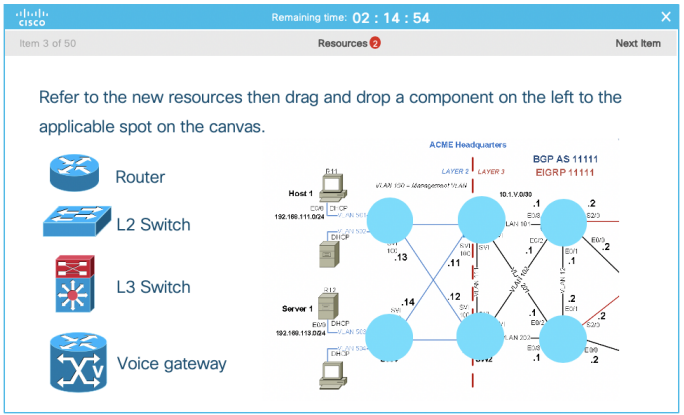
Item 4 of 50 | Resources 3 | Next Item

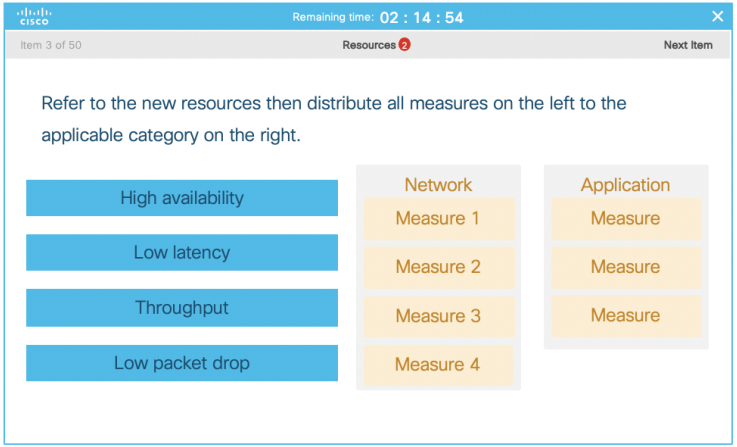
Point and click which router will run DMVPN

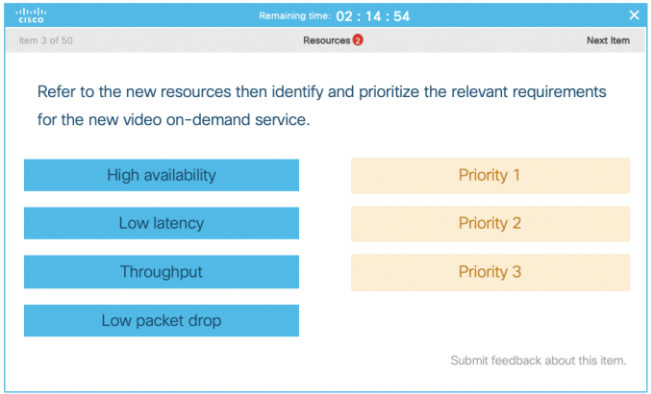


Submit feedback about this item.

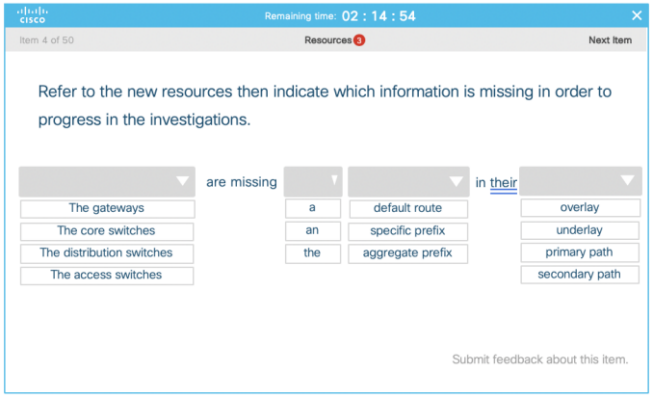
Drag and Drop





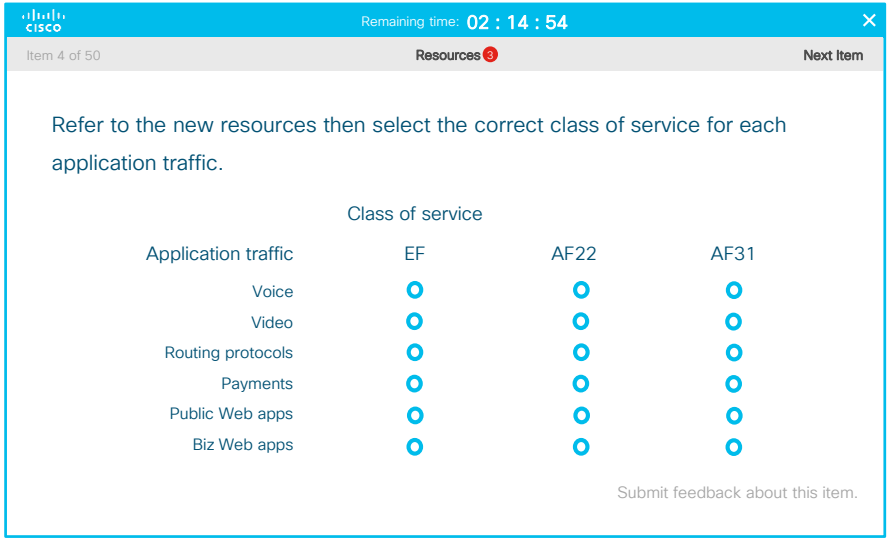


Dropdown

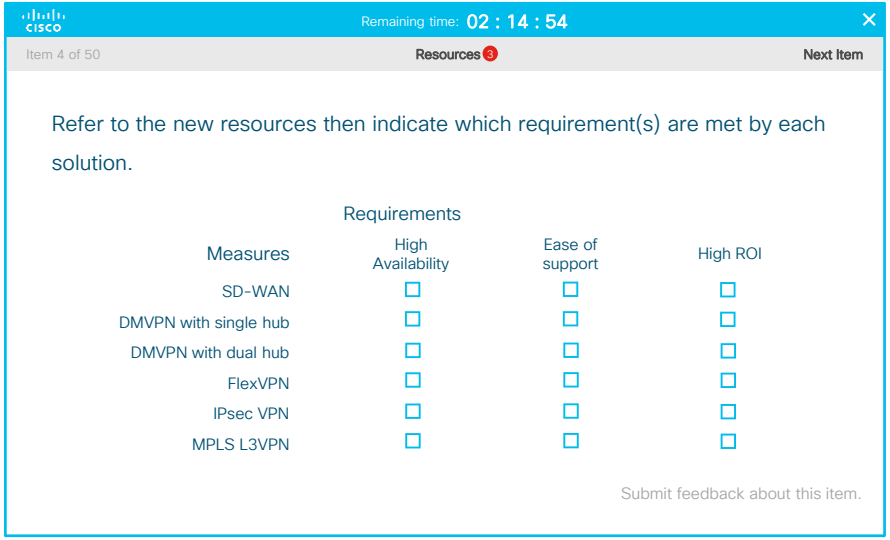


Matrix

MCSA Matrix

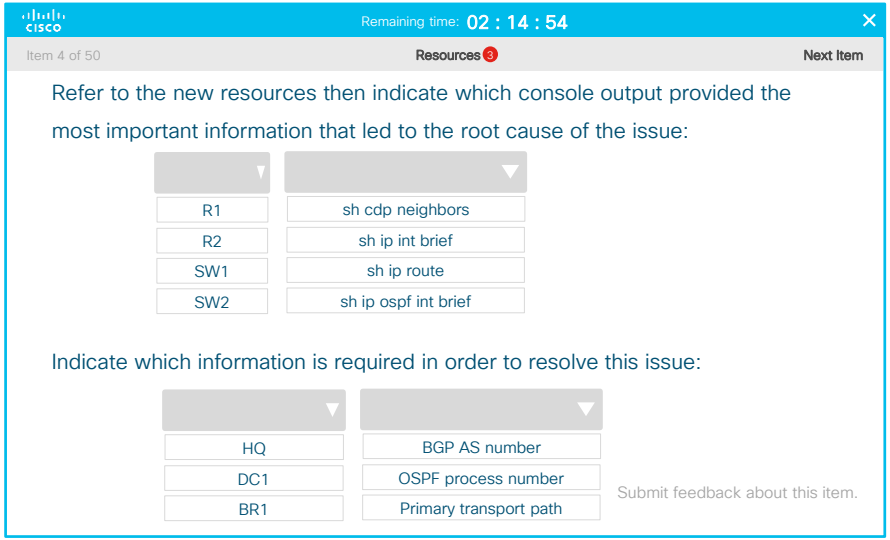


MCMA Matrix

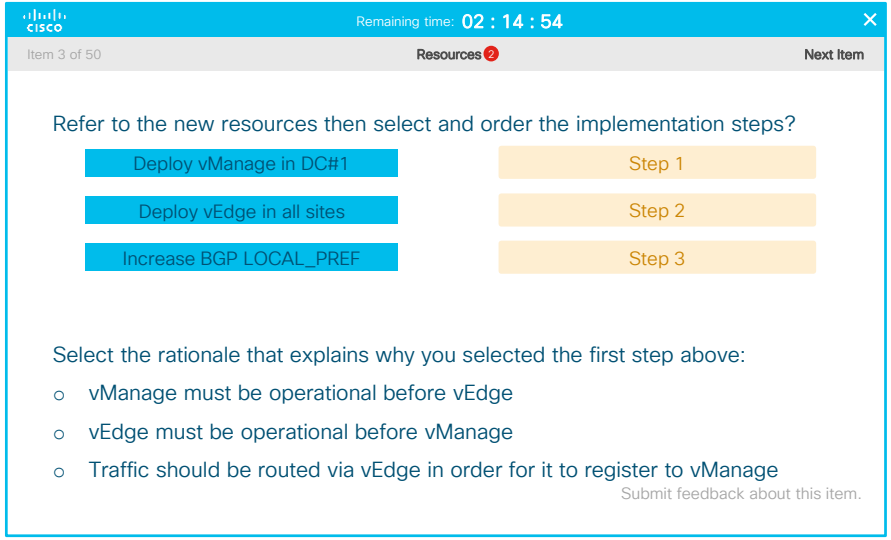


Multiple question per Item

Multiple dropdown rows



Various question types



Exam Case Studies

- Written Exam Samples
- Lab Exam Web GUI
- DESIGN
  - Strategy & Tactics
  - Anatomy of a DESIGN item
  - 5x Sample Incidents
- DOO

Exam Case Studies

- Written Exam Samples
- Lab Exam Web GUI
- DESIGN
- DOO
  - Strategy & Tactics
  - Anatomy of a DOO item
  - 5x Sample Incidents

cisco Live!

DOO Strategy & Tactics: Anticipate, Do, Verify!

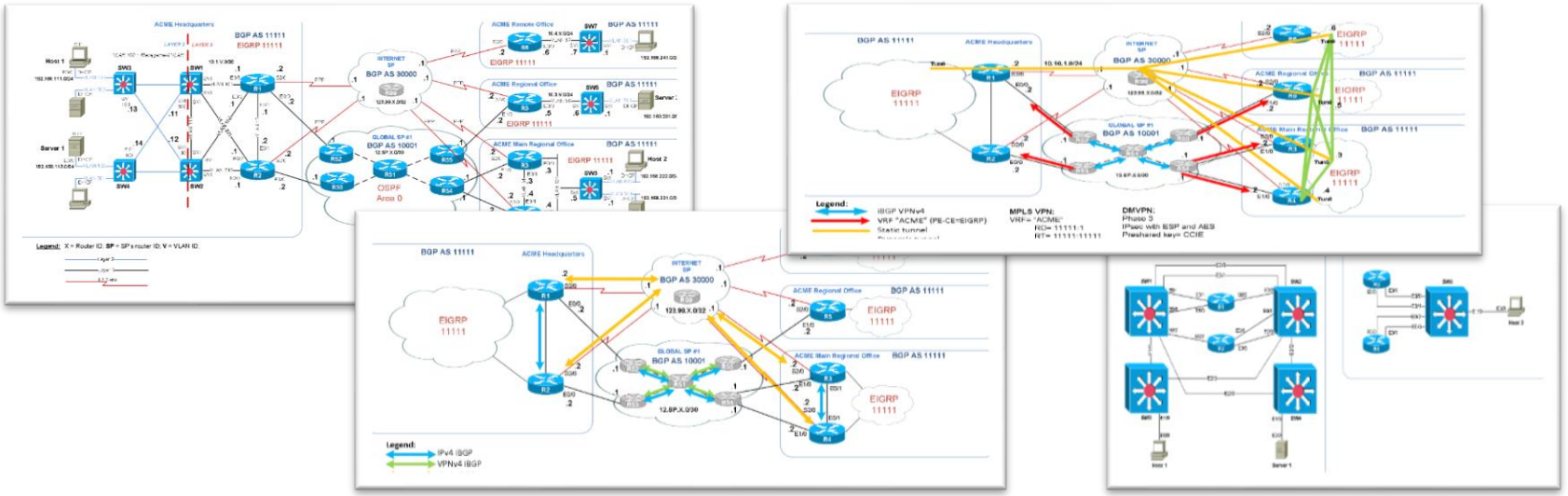
- Quickly read the whole scenario!
  - Gauge item difficulty and identify inter-dependency between items.
- Determine the item sequence for efficient implementation!
- Work item as a unit! Keep note when missing requirements!
- Identify explicit vs implicit requirements
- ...

DOO Strategy & Tactics: Anticipate, Do, Verify!

- ...
- Think about smart configuration options before jumping to configuration.
  - Choose fastest solution option.
  - Minimize keyboard effort (plain text editor, copy/paste, aliases, minimal CLI, ...)
- Enable debugs, test and validate solutions.
- Better to use a prohibited solution than missing a requirement!
- Verify all requirements – Reread the whole stem!

DOO Diagrams

- Authoritative source of truth!
- Might require correlating between multiple diagrams



Quick Read … 10-15min

- Understand overall scenario or high-level design
- Identify Item interdependency

Quick Read … 10-15min

- Understand overall scenario or high-level design
  - Single enterprise with main site and remote sites (dual- and single-homed)
  - Main site has 3-tier architecture (L2 access/distribution/core)
  - Same BGP AS# in all BGP sites
  - Unique IGP (EIGRP)
  - Managed Services (MPLS VPN from SP)
  - Backup circuit (DMVPN over Internet)
- Identify Item interdependency

Quick Read … 10-15min

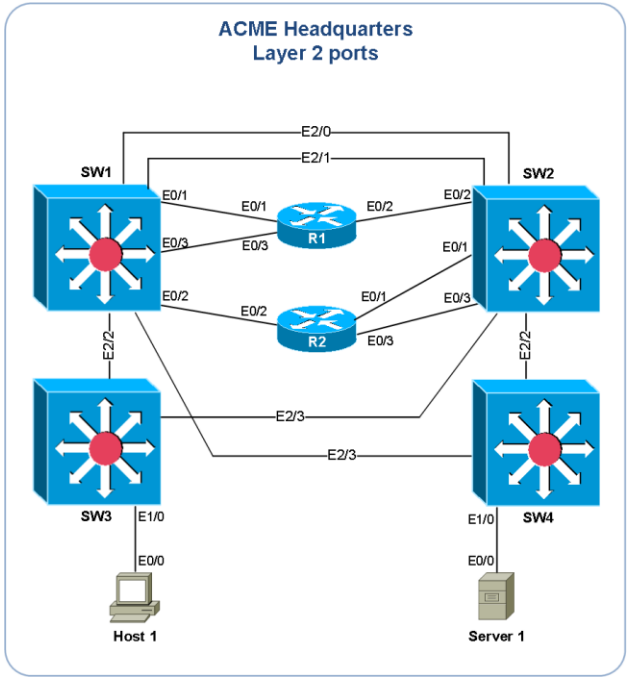
- Understand overall scenario or high-level design
  …
- Identify Item interdependency
  - L2 Section required for some L3/IGP items
  - VPN Section required for some L3/IGP items
  - Most RP (IGP+BGP) items required for Routing Policies item
  - …

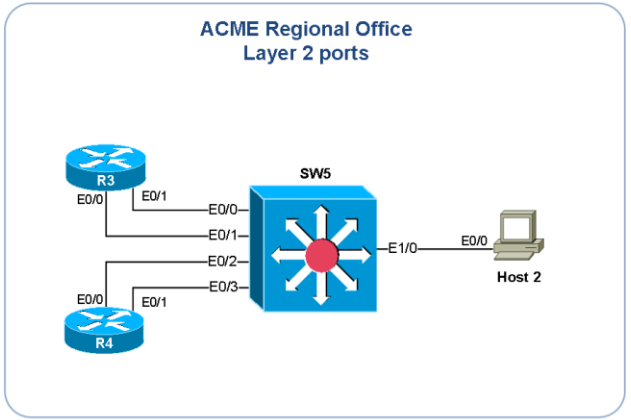
Anatomy of a DOO Form…

- Guidelines
- Diagrams
  - Layer 2, Ports/VLAN
  - IGP, BGP, VPN
  - IPv4/IPv6
  - Etc…

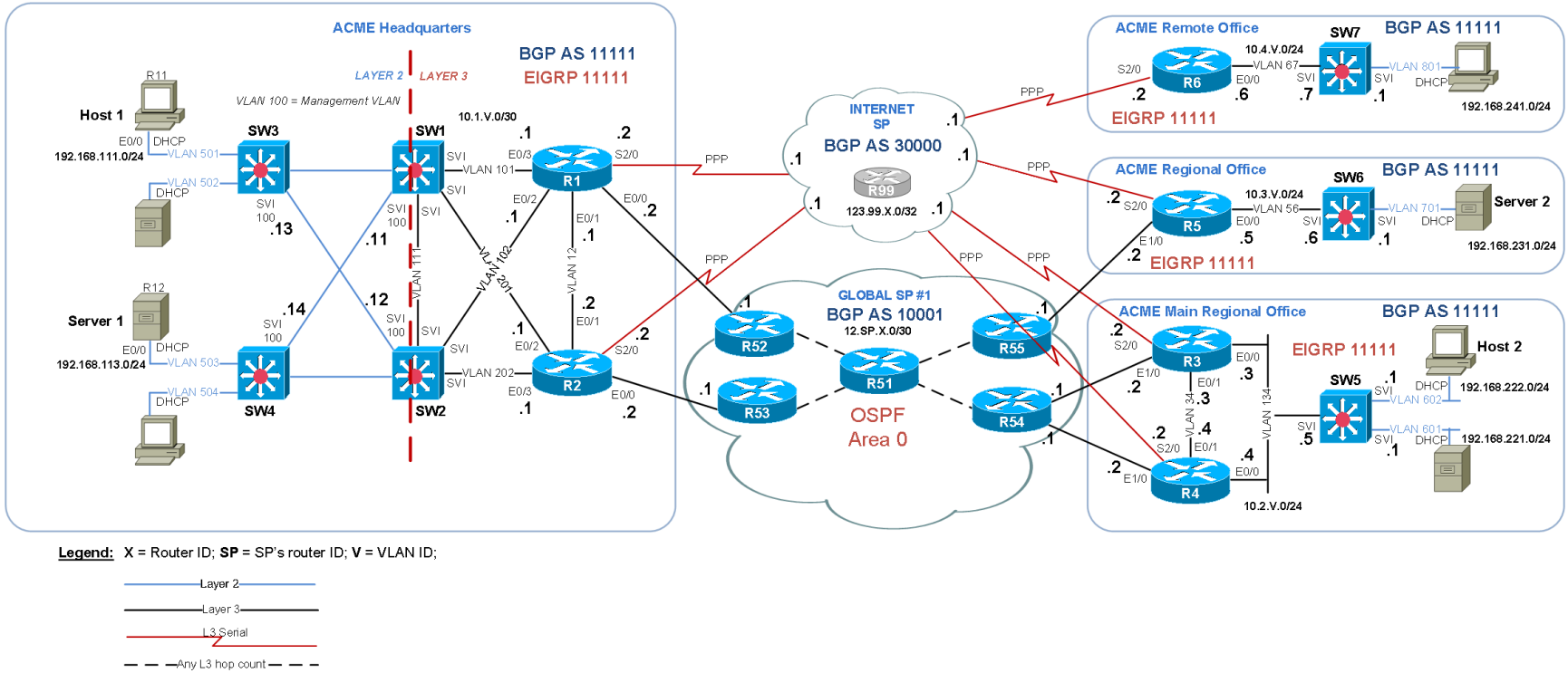
- Form Sections
  - Items
    - Requirements
      - Explicit
      - Implicit
      - Functional
    - Score

DOO Case Study: Layer 2 Connections





DOO Case Study: IGP Topology



Legend: X = Router ID; **SP** = SP's router ID; **V** = VLAN ID;

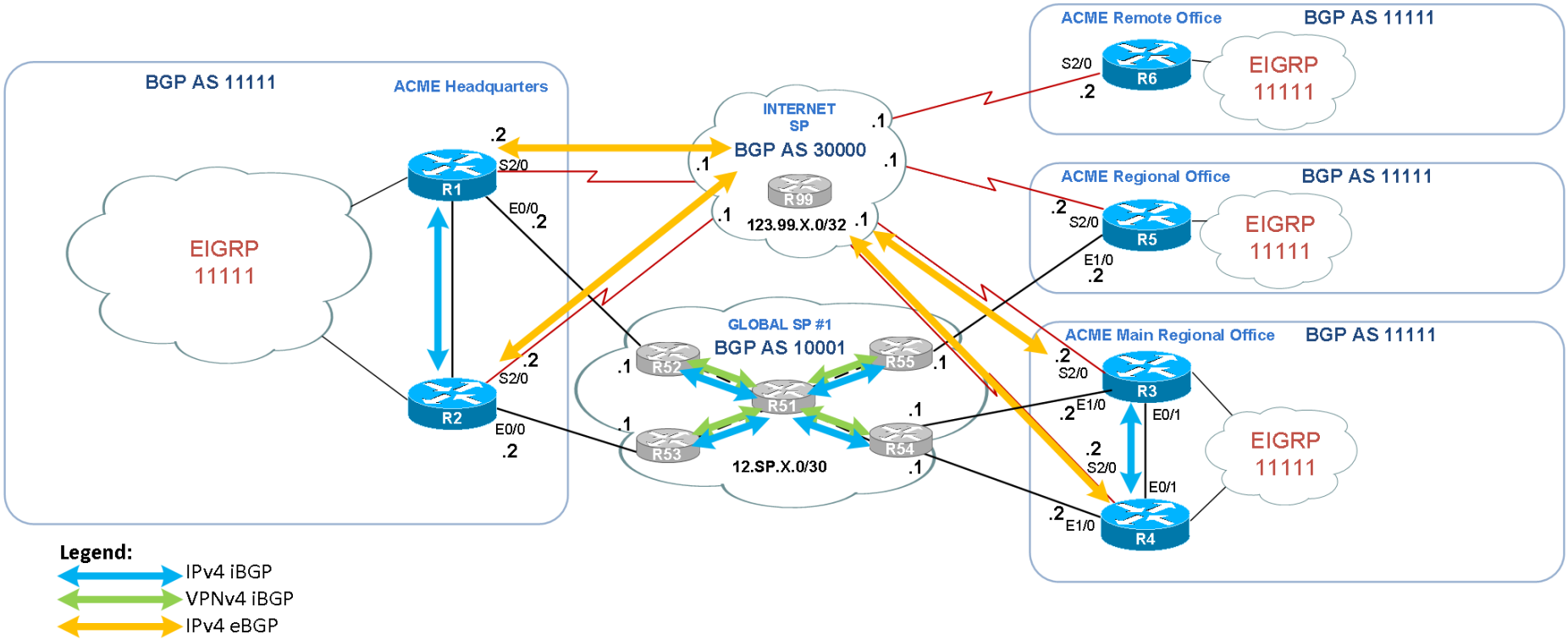
Layer 2

Layer 3

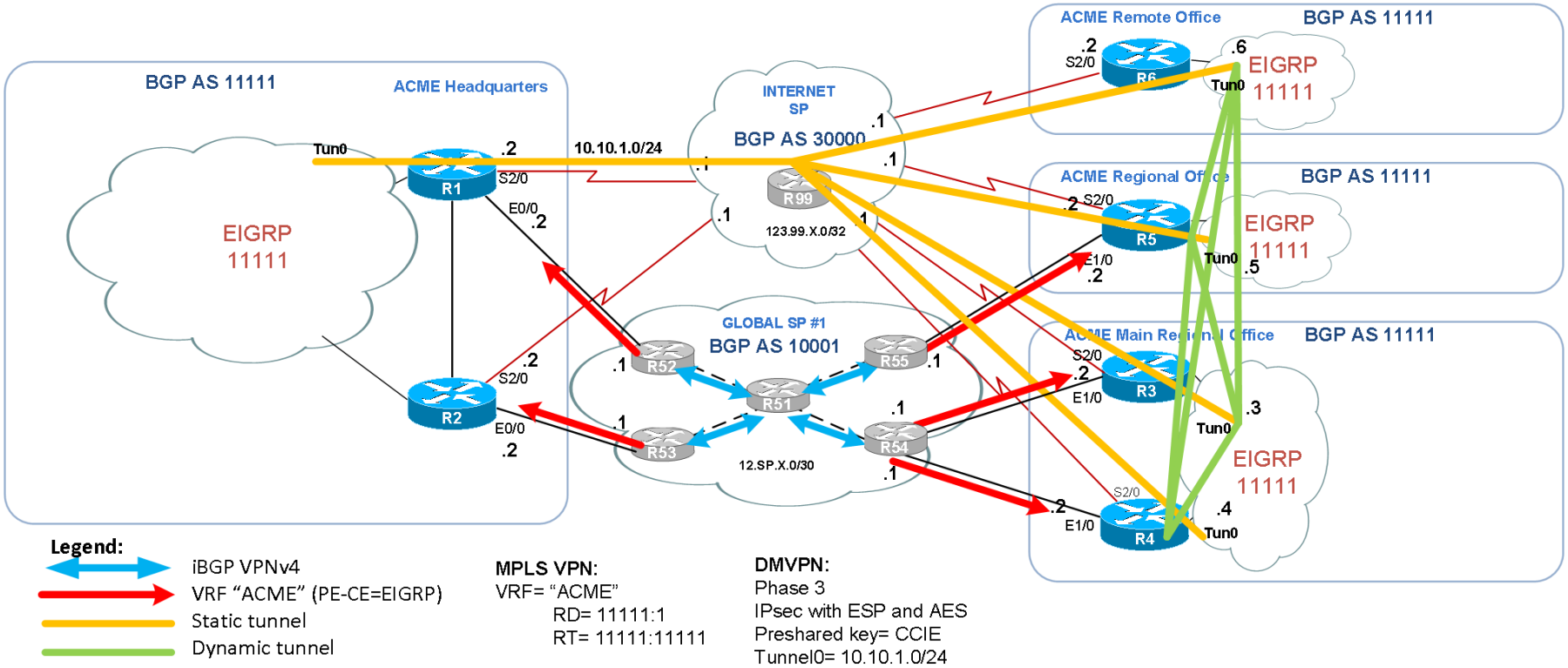
L3 Serial

Any L3 hop count

DOO Case Study: BGP Topology



DOO Case Study: VPN Topology



Legend:

- iBGP VPNv4
- VRF "ACME" (PE-CE=EIGRP)
- Static tunnel
- Dynamic tunnel

MPLS VPN:
VRF= "ACME"
RD= 11111:1
RT= 11111:11111

DMVPN:
Phase 3
IPsec with ESP and AES
Preshared key= CCIE
Tunnel0= 10.10.1.0/24

DOO Sample Item#1

Refer to “Diagram 1: Layer 2 Connections”.

Configure VLAN Trunking Protocol in the ACME Headquarters network as per the following requirements:

- Use VTP version 2.
- The VTP domain name is ”CCIE” (without quotes).
- Secure the VTP advertisements with a MD5 hash of the string ”CCIE" (without quotes).
- SW1 must propagate all VLAN configuration changes to SW2, SW3, and SW4.
- Verify that SW2, SW3 and SW4 accept all VLAN configuration changes done on SW1.

Configure the trunk ports in ACME Headquarters network as per the following requirements:

- Configure interfaces E2/0 to E2/3 of SW1 and SW2 as dot1Q trunks.
- Configure interfaces E2/2 and E2/3 of SW3 and SW4 as dot1Q trunks.
- All trunks must set the native VLAN to VLAN 999.
- All VLANs must be allowed on all trunks.

DOO Sample Item#1: Explicit requirements

Refer to “Diagram 1: Layer 2 Connections”.

Configure VLAN Trunking Protocol in the ACME Headquarters network as per the following requirements:

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- All trunks must set the native VLAN to VLAN 999.
- All VLANs must be allowed on all trunks.

DOO Sample Item#1: Implicit requirements

Refer to “Diagram 1: Layer 2 Connections”.

Configure VLAN Trunking Protocol in the ACME Headquarters network as per the following requirements:

- Use VTP version 2.
- The VTP domain name is ”CCIE” (without quotes).
- Secure the VTP advertisements with a MD5 hash of the string ”CCIE" (without quotes).
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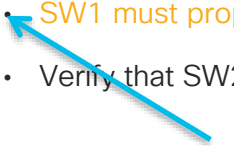

... Functional & Independent...

...

DOO Sample Item#1: Validation requirements

Refer to “Diagram 1: Layer 2 Connections”.

Configure VLAN Trunking Protocol in the ACME Headquarters network as per the following requirements:

- Use VTP version 2.
- The VTP domain name is ”CCIE” (without quotes).
- Secure the VTP advertisements with a MD5 hash of the string ”CCIE" (without quotes).
- SW1 must propagate all VLAN configuration changes to SW2, SW3, and SW4.
- Verify that SW2, SW3 and SW4 accept all VLAN configuration changes done on SW1.

Explicit verification

...

DOO Sample Item#1: Easy item

- Low points value.
- Very explicit requirements.
- Independent functional requirements.
- Very similar configuration for multiple devices.

DOO Sample Item#2

Configure the ACME network as per the following requirements:

- Configure a static default route on R1 pointing to 123.99.1.1.
- Configure a static default route on R2 pointing to 123.99.2.1.
- Configure a static default route on R5 pointing to 123.99.5.1.
- Configure a static default route on R6 pointing to 123.99.6.1.
- Configure a static route on R5 for 123.99.0.0/16 pointing to 123.99.5.1.
- SW5 must install two equal-cost external default routes into its routing table.
- SW6 must receive a default route from R5; no other EIGRP prefix must be propagated to SW6.
- SW7 must receive only an internal default route from R6, no other EIGRP prefix must be propagated to SW7.
- R1 and R2 must propagate a default route into the EIGRP domain as an external route.
- R3 and R4 must receive an external default route from either R1 or R2.
- The headquarters must have reachability to all access VLANs of all remote sites (VLAN 601, 602, 701 and 801) via either the DMVPN cloud or via the MPLS VPN.

DOO Sample Item#2: Explicit requirements

Configure the ACME network as per the following requirements:

- Configure a static default route on R1 pointing to 123.99.1.1.
- Configure a static default route on R2 pointing to 123.99.2.1.
- Configure a static default route on R5 pointing to 123.99.5.1.
- Configure a static default route on R6 pointing to 123.99.6.1.
- Configure a static route on R5 for 123.99.0.0/16 pointing to 123.99.5.1.
- SW5 must install two equal-cost external default routes into its routing table.
- SW6 must receive a default route from R5; no other EIGRP prefix must be propagated to SW6.
- SW7 must receive only an internal default route from R6, no other EIGRP prefix must be propagated to SW7.
- R1 and R2 must propagate a default route into the EIGRP domain as an external route.
- R3 and R4 must receive an external default route from either R1 or R2.
- The headquarters must have reachability to all access VLANs of all remote sites (VLAN 601, 602, 701 and 801) via either the DMVPN cloud or via the MPLS VPN.

DOO Sample Item#2: Implicit requirements

Configure the ACME network as per the following requirements:

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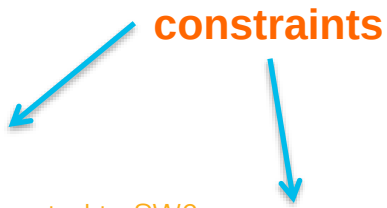
- Configure a static default route on R5 pointing to 123.99.5.1.
- Configure a static default route on R6 pointing to 123.99.6.1.
- Configure a static route on R5 for 123.99.0.0/16 pointing to 123.99.5.1.
- SW5 must install two equal-cost external default routes into its routing table.
- SW6 must receive a default route from R5; no other EIGRP prefix must be propagated to SW6.
- SW7 must receive only an internal default route from R6, no other EIGRP prefix must be propagated to SW7.
- R1 and R2 must propagate a default route into the EIGRP domain as an external route.
- R3 and R4 must receive an external default route from either R1 or R2.
- The headquarters must have reachability to all access VLANs of all remote sites (VLAN 601, 602, 701 and 801) via either the DMVPN cloud or via the MPLS VPN.

DOO Sample Item#2: Implicit+ requirements

Configure the ACME network as per the following requirements:

- Configure a static default route on R1 pointing to 123.99.1.1.
- Configure a static default route on R2 pointing to 123.99.2.1.
- Configure a static default route on R5 pointing to 123.99.5.1.
- Configure a static default route on R6 pointing to 123.99.6.1.
- Configure a static route on R5 for 123.99.0.0/16 pointing to 123.99.5.1.
- SW5 must install two equal-cost external default routes into its routing table.
- SW6 must receive a default route from R5; no other EIGRP prefix must be propagated to SW6.
- SW7 must receive only an internal default route from R6, no other EIGRP prefix must be propagated to SW7.
- R1 and R2 must propagate a default route into the EIGRP domain as an ~~external route~~.
- R3 and R4 must receive an external default route from either R1 or R2.
- The headquarters must have reachability to all access VLANs of all remote sites (VLAN 601, 602, 701 and 801) via either the DMVPN cloud or via the MPLS VPN.



DOO Sample Item#2: Difficult item

- Higher points value.
- May have some explicit requirements.
- Will have implicit requirements.
- Requires more anticipation, configuration and verification!
- Relies on completion of any other item(s)!
- Might contain a hidden bomb!

DOO requirements types

- Explicit: clearly calls out what must be done, no interpretation
- Implicit: provides information about desired specification without calling it out
  - Functional: describes a difference between two features or protocols to narrow down solution choice
  - Outcome: describes the result or effect of a feature or protocol
  - Independent: doesn't rely on completion of any other item's requirement(s)*
  - Interdependent: does rely on completion of any other item's requirement(s)
- (*) though may rely on other requirement(s) of the current item…

DOO requirements types

- Constraint: imposes a restriction between optional so
- Validation: describes required verification steps (not sufficient)
- Distractor: doesn't require any action

- Know Your Enemy
  - Overview
  - Exam Curriculum
  - Exam Design
- Plan of Attack
  - Exam Preparations
  - Exam Guidelines & Strategy
- Battlefield Tactics
  - Exam Case Studies
  - Exam Tips & Tricks

CCIE Lab exam Tips & Tricks

Before...

- Prepare for the exam! ☺
  - Build a learning plan
  - Active Learning...
  - Practice, practice, practice...
- Build and Practice your own exam strategy & tactics!

CCIE Lab exam Tips & Tricks

Strategy & Tactics Summary

- **Don't try to ACE it!** < "Just" PASS it! < Cherry pick!
- **Do not get stuck!** < Manage your time! < Set a Timer < Move on!
- **Do not assume!** < Pay attention to the detail! < Verify!
- **Build your confidence level!** < Control your stress! < Cherry Pick < Relax!
- **Make your choice!** < Identify plausible options < Choose
- **Anticipate, Do, Verify!** < Read < Plan < Do ("be smart") < Debug, Test, Verify!

CCIE Lab exam Tips & Tricks

Before...

- Familiarize yourself with the web delivery system and tools
  - Cisco Learning Labs
  - CCIE Lab Builder
  - Ciscolive presentation
  - Walk In Labs @CL

- Practice browsing Cisco Documentation
- Learn CLI shortcuts!

CCIE Lab exam Tips & Tricks

Before...

- Travel to the lab location if needed
  - “Plan for the worst, hope for the best”
  - Arrive on the day before your exam…
- Do a site-survey
  - Measure commute time from hotel and know start time!
  - Identify entrance location
- Have a good dinner & sleep enough!
  - Do whatever you need to have a fit body condition for the next day

CCIE Lab exam Tips & Tricks

During…

- Reduce stress, arrive early and prepare ID's!
- Listen to proctor's guidelines (empty pockets, etc)!
- If needed, use ear-plugs, medicine, food…
- Manage your time! Stick to your strategy!
- Read the whole module (don't forget the guidelines!)
- Cherry pick items!
- Don't get stuck at the beginning!
- Build your confidence!

CCIE Lab exam Tips & Tricks

During…

- Don’t get intimated by big topologies!
- Triple read questions before asking help to the proctor!
- Save configs often! Avoid last minute change!
- Plan for “regression tests” and overall validations at the end of each module!
- Use the scratch paper to track progress (item table) and notes
- Draw topologies if really needed (be careful with time!)
- Target 80 or 90%! Don’t shoot for 100% – unless you have time!!

CCIE Lab exam Tips & Tricks

After…

- If you pass, well… you know what to do! ☺
- If you failed:
  - Release the anger! Try to switch from ‘Denial’ to ‘Curious’ quickly
  - Start looking for your mistakes (especially typos, missing requirements!)
  - Repeat the scenario in your home lab
  - Back to lab practice with focus on the failed topics and verification methods
  - Book for the next lab exam ASAP
  - Only ask for a re-read if you have done all the above, and 100% sure CCIE Program team is wrong! Beware of very low turnover rate!!

“You never fail until you stop trying.”

Albert Einstein

Complete your online session survey

- Please complete your session survey after each session. Your feedback is very important.
- Complete a minimum of 4 session surveys and the Overall Conference survey (starting on Thursday) to receive your Cisco Live t-shirt.
- All surveys can be taken in the Cisco Events Mobile App or by logging in to the Content Catalog on ciscolive.com/emea.

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