CCIE Data Center Exam, Revision 3.1

Blueprint Revisions

Products and technologies are evolving faster than ever before. To keep up with the fast pace, we are introducing a new agile process that will allow us to align our exams faster with these changes: *minor revisions*. Minor revisions will provide us with the agility and speed that are necessary to adjust our programs to match industry changes and the evolution of technologies. Minor revisions will allow us to update track details (exam blueprint, equipment list, and software) more frequently while keeping overall changes to a minimum (smaller than 20%). These revisions allow us to ensure our content stays relevant, and they minimize learning curves in between revisions.

The main objective of a minor revision is to:

- Further scope out the exam blueprint by ensuring exam objectives are clear.
- Introduce new blueprint tasks to ensure exams stay relevant today.
- Phase out old(er) products and/or technology solutions that are less relevant today.
- Update equipment and/or software.

Today we are revising the CCIE Data Center exam.

CCIE Data Center exam, minor revision 3.1

The CCIE Data Center exam is going through a *minor revision* (changes are small and incremental). Although the overall domains within the exam blueprint might look similar at first look, with this minor revision we both added and removed technology solutions to ensure exam relevancy.

Refer to https://learningnetwork.cisco.com for the list of exam topics covered in the updated CCIE Data Center exam and for more information about the CCIE certification program.

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Exam Topics Changes - Highlights

V3.0	V3.1
1. Data Center L2/L3 Connectivity (20%)	**1. Data Center L2/L3 Connectivity (20%)**
1.2 Routing Protocols and features 1.2.c BGP 1.2.c.i Path Selection 1.2.c.ii External and Internal Peering 1.2.c.iii Route reflector and Route Server 1.2.c.iv Peer Templates 1.2.c.v Multi-Hop EBGP 1.2.c.vi Route Aggregation/Summarization 1.2.c.vii Route Redistribution	1.2 Routing protocols and features 1.2.c BGP 1.2.c.i Path selection 1.2.c.ii External and internal peering 1.2.c.iii Route reflector and route server 1.2.c.iv Peer templates 1.2.c.v Multihop EBGP 1.2.c.vi Route aggregation/summarization 1.2.c.vii Route redistribution 1.2.c.viii Local AS number
2. Data Center Fabric Infrastructure (15%)	**2. Data Center Fabric Infrastructure (15%)**
2.1. Physical fabric components 2.1.a Fabric Discovery 2.1.b Controllers/Network Managers 2.1.c Switches 2.2. Fabric policies 2.2.a Access Policies 2.2.b Multi Tenancy 2.2.c Monitoring Policies 2.3. Tenant Policies 2.3.a Application profiles and EPGs 2.3.b Networking 2.3.c Security 2.4. Fabric Monitoring 2.4.a Faults 2.4.b Events 2.4.c Health indicators 2.4.d Audit Logs 2.5. Virtual Networking 2.5.a vSphere VDS	2.1. Physical fabric components 2.1.a Fabric discovery 2.1.b Controllers 2.1.c Switches 2.1.d Multi-Tier architecture 2.2. ACI policies 2.2.a Access policies 2.2.b Fabric policies 2.2.c Multi-tenancy 2.3. Overlay policies 2.3.a Tenants, application profiles, EPGs, and ESGs 2.3.b Networking (VRFs, bridge domains) 2.3.c Security (contracts, filters, vzAny) 2.4. Fabric monitoring 2.4.a Faults 2.4.b Events 2.4.c Health indicators 2.4.d Audit logs 2.5. Virtual networking

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	2.5.a vSphere VDS with or without VMM integration
3. Data Center Fabric Connectivity (15%)	**3. Data Center Fabric Connectivity (15%)**
3.1. VRF lite 3.2. L3Out 3.2.a. OSPF 3.2.a.i Authentication 3.2.a.ii Adjacencies 3.2.a.iii Network Types and Area Types 3.2.a.iv Route Redistribution 3.2.b. BGP 3.2.b.i AS Manipulation 3.2.b.ii External and Interna Peering 3.2.b.iii Route Reflectors 3.2.b.iv Route Redistribution 3.2.c. Transit Routing 3.3. Inter Fabric connectivity 3.3.a Multi-Pod 3.3.b Multi-Site 3.3.c Virtual POD 3.3.d remote Leaf 3.4. Overlays 3.4.a VXLAN EVPN	3.1. Overlay fabrics 3.1.a ACI 3.1.b VXLAN EVPN 3.2. External connectivity 3.2.a VRF Lite 3.2.b OSPF 3.2.b.i Authentication 3.2.b.ii Adjacencies 3.2.b.iii Network types and area types 3.2.b.iv Route redistribution 3.2.c. BGP 3.2.c.i AS manipulation 3.2.c.ii External and internal peering 3.2.c.iii Route reflectors 3.2.c.iv Route redistribution 3.2.d. Transit routing 3.3. Inter-fabric connectivity 3.3.a. Multi-Site: ACI or VXLAN EVPN 3.3.b. ACI Multi-Pod 3.3.c. ACI remote leaf
4. Data Center Compute (15%)	**4. Data Center Compute (15%)**
4.1. Compute Resources 4.1.a UCSM Policies, Profiles and Templates 4.1.b Hyperflex 4.2. Compute Connectivity 4.2.a SAN/LAN uplinks 4.2.b Rack server integrations 4.2.c Port Modes	4.1. Compute resources 4.1.a Compute policies, profiles and templates 4.1.b Nutanix 4.2. Compute connectivity 4.2.a SAN/LAN uplinks 4.2.b Rack server integrations 4.2.c Port modes 4.3. Compute management 4.3.a UCS Manager 4.3.b Intersight
5. Data Center Storage Protocols and Features (10%)	**5. Data Center Storage Protocols and Features (10%)**
5.1. FC and FCoE 5.1.a Zoning 5.1.b NPV/NPIV 5.1.c Trunking	5.1. FC and FCoE 5.1.a Zoning 5.1.b NPV/NPIV 5.1.c Trunking

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5.1.d Portchannel 5.1.e Load Balancing 5.2. iSCSI 5.2.a Authentication 5.2.b Multipathing 5.3. RoCE v2 over IP Networks	5.1.d PortChannel 5.1.e Load balancing 5.2. RoCE v2 over IP networks 5.2.a DCQCN congestion control 5.2.a.i PFC 5.2.a.ii ECN
6. Data Center Security and Network Services (10%)	**6. Data Center Security and Network Services (10%)**
6.4 Services 6.4.a Flow/Telemetry Export 6.4.b SPAN 6.4.c SNMP 6.4.d Syslog 6.4.e DHCP 6.4.f NTP/PTP	6.4 Services 6.4.a Flow/telemetry export 6.4.b (R)SPAN/ERSPAN 6.4.c SNMP 6.4.d Syslog 6.4.e DHCP 6.4.f NTP/PTP
7. Data Center Automation and Orchestration (15%)	**7. Data Center Automation and Orchestration (15%)**
7.1. Data center tasks using scripts (Python and Ansible) 7.1.a Create, Read, Update, Delete using RESTful APIs 7.1.b Deploy and modify configurations 7.1.c Statistics, Data Collection 7.2. Data Center Automation and Orchestration using tools 7.2.a DCNM 7.2.b UCSD 7.2.b.i Tasks 7.2.b.ii Workflows 7.2.b.iii Catalog 7.2.c Intersight 7.2.d CloudCenter Suite 7.2.d.i Applications 7.2.d.ii Deployments 7.2.d.iii Action Orchest	7.1. Data center tasks using scripts (Python, Ansible, and Terraform) 7.1.a Create, read, update, delete using RESTful APIs 7.1.b Deploy and modify configurations 7.1.c Statistics and data collection 7.2. Data center automation and orchestration tools 7.2.a Nexus Dashboard 7.2.a.i Orchestrator 7.2.a.ii Fabric Controller 7.2.a.iii Insights 7.2.b Cloud Network Controller

Compared to v3.0, the new v3.1 revision maintains the current seven main domain names and domain weightings. However, changes have been introduced in all seven domains of the blueprint, paying special focus to core essential topics that are more relevant in the industry today and providing additional context to better understand the scope of each individual task.

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1. Data Center L2/L3 Connectivity
In task 1.2.c, the following topic was added:

- Local-AS number

2. Data Center Fabric Infrastructure
In task 2.1, the following topic was added:

- Multi-tier architecture

Task 2.2 was renamed to ACI policies. In this task following changes have been made:

- The Monitoring Policies topic was removed as it is included in Access and Fabric policies topics.
- The Fabric polices topic was added.

Task 2.3 was renamed to Overlay policies. All topics have been refined with the names of policies that fit into each given topic. The following functionalities were added:

- Endpoint Security Groups (ESGs)
- vzAny

3. Data Center Fabric Connectivity
The entire section had been restructured to align with: ACI and VXLAN EVPN fabrics. This is why:

- The entire task 3.1, along with its subsequent topics was added.
- Task 3.2 was renamed to be applicable to both fabrics.
- The previous 3.1 topic was moved as a subtask in 3.2.
- In task 3.3:
  - Virtual POD was removed as the solution is no longer developed.
  - Multi-site was refined to apply to: ACI and VXLAN EVPN fabrics.
- Task 3.4 was removed.

4. Data Center Compute
The following changes have occurred in this section:

- Task 4.1.a has been generalized to be applicable to: UCS Manager and Intersight.
- Previous task 4.1.b, which focused on Hyperflex, has been replaced with the new compute hyperconverged solution Nutanix. The Hyperflex solution itself is no longer developed.
- Topic 4.3 was added to indicate two management solutions belonging to this domain.

5. Data Center Storage Protocols and Features
In this section, it was decided to remove the iSCSI-related tasks. Instead, topics related to ROCEv2 have been expanded to address the growing popularity of AI/ML clusters.

6. Data Center Security and Network Services
In this task there are no major changes except for the specification of task 6.4.b.

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7. Data Center Automation and Orchestration
This entire section underwent a comprehensive overhaul, including the following changes:

- Adding Terraform to task 7.1
- Adding Nexus Dashboard with Orchestrator, Fabric Controller, and Insights services
- Adding Cloud Network Controller (formerly Cloud ACI / APIC)
- Removing DCNM (rebranded to NDFC)
- Removing UCSD and related subtasks (solution no longer developed)
- Removing CloudCenter Suite and related subtasks (solution no longer developed)
- Transferring the previous 7.2.c subtask to section 4

Hardware and Software Equipment

In support of the updated CCIE Data Center revision 3.1 the lab exam environment changes were made to the equipment and software releases used. However, as per minor revision guidelines, no additions to the hardware list have been introduced. Candidates who want to prepare for the exam are now advised to use the updated Cisco equipment and software releases.

The following equipment has been removed from the lab exam:

- Nexus 2348 Fabric Extender
- Cisco HyperFlex HX220c M5

The following changes have been made to the software list:

- Added Nexus Dashboard 3.x with the following services:
  - Orchestrator v4.x
  - Fabric Controller v12.x
  - Insights 6.x
- Updated Cisco NX-OS to v10.x on Nexus 9000 switches
- Updated Cisco ACI version to v5.x
- Removed Cisco Data Center Network Manager (replaced with NDFC)
- Removed Cisco UCS Director
- Removed Cisco Hyperflex
- Removed ACI Multi-site (replaced with NDO)

Exam format

No changes have been made to the lab exam format in this minor revision.