

VMWARE CERTIFIED DESIGN EXPERT - END USER COMPUTING 2022

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The VMware Certified Design Expert - End-User Computing (EUC) is an advanced certification developed for architects of VMware Horizon 7® and/or VMware Workspace ONE solutions. The VCDX-EUC 2021 program measures a candidate's ability to design, implement, document, and test scalable, complex, Desktop Virtualization and Mobile Computing® environments that meet specific customer business objectives.

Goals of the VCDX-EUC 2021 program

- o Allow certified individuals to differentiate themselves in the marketplace as having demonstrated a level of knowledge and skill to successfully design, implement, document, and test enterprise-wide deployments of VMware Desktop and Mobility platforms.
- o Allow client organizations to verify that practitioners have the necessary knowledge and skills to successfully design, document, implement, and test enterprise-wide deployments of VMware technology-based environments.
- o Have organizations (clients and partners) that design and implement VMware technology-based virtual infrastructures benefit from a body of practitioners that have validated their knowledge and skills relevant to performing the task.

Benefits of Becoming a VCDX

- o Publicly recognized credential validating advanced level of competence in VMware Horizon 7® and/or VMware Workspace ONE solutions-based designs
- o Distinction for organizations with VCDX certified professionals
- o Increased customer confidence in designs delivered by VCDXs
- o Membership in an elite community of practice

Intended Audience

In his or her typical job role, the successful VCDX - EUC candidate holds primary responsibility for the architectural design of VMware Horizon 7® and/or VMware Workspace ONE solutions including configuration recommendations, integration of third-party components, implementation planning, and deployment validation processes and procedures. The candidate is capable of creating a highly scalable, on-premises enterprise-level design that incorporates a Horizon 7 desktop, remote application, and/or VMware Workspace ONE.

- o No specific number of years of experience in VMware desktop and mobility solution design is required.
- o Candidates are not required to be employed by particular types of companies.
- o No specific higher-education requirement is made.
- o No specific job role or job title is required.

Certification Requirements

Achieving the VCDX-EUC 2021 certification requires the following steps:

- For new candidates:
 - o Earn the current VMware Certified Professional - Desktop Management (VCP-DTM) certification
 - o Earn the current VMware Certified Implementation Expert - Desktop Management (VCIX-DTM) badge
 - The badge is earned by earning both the current VMware Certified Advanced Professional - Desktop Management Design (VCAP-DTM Design) and the VMware Certified Advanced Professional - Desktop Management Deployment certifications (any version)
 - Note: for upgraded VCIX badges from a previous version, the VMware Certified Advanced Professional - Desktop Management (VCAP-DTM Design) is required
 - o Have the VCDX-EUC 2021 application package approved and be invited to defend
 - o Successfully pass the VCDX-EUC 2021 defense

The certification is granted based on the knowledge, skills, and abilities of the candidate, rather than simply on the submitted design. The design and the defense session are the tools by which the candidate's knowledge, skills, and abilities are evaluated.

- For existing VCDX-Desktop or VCDX-Desktop and Mobility candidates:
 - o Pass the VCAP-DTM Design exam
- For existing VCDXs in other tracks:
 - o Earn the VMware Certified Implementation Expert - Desktop Management (VCIX-DTM) badge (for upgraded VCIX badges from a previous version, the VCAP-DTM Design is required)
 - o Have the VCDX-EUC 2021 application approved and be invited to defend
 - o Successfully pass a remote one-hour VCDX-EUC 2021 defense

The VCDX-EUC 2021 Application and Design

After a brief sketch of the candidate's professional qualifications, the application provides an overview of a VMware Horizon 7® and/or VMware Workspace ONE design project that the candidate wishes to present and defend. The submitted project may be actual (in other words, it was built on behalf of a real design client), fictional, or a blend of actual and fictional elements.

The design you submit must be for an infrastructure

where business requirements drive design and implementation decisions suited for mission-critical applications in a managed environment.

Full details on the application submission process are in the application document.

Once submitted, the application will be reviewed by VMware Certified Design Expert panelists. It may be rejected on any of the following grounds:

The application form or the supporting documentation contain the work of others that is not explicitly marked as such.

The submission is not detailed enough in describing design considerations, justifications, and their impact. It should demonstrate the candidate's clear understanding of the deployment and operational implications of the virtual infrastructure design.

Design documents submitted do not include the required documentation listed in the application. The application package must include all supporting documentation requested.

The documentation is not consistent with the design presented.

The application merely echoes published sample implementations, templates, and defaults, without demonstration of the candidate's design skills.

The application proposes a defense of a design that is not robust or complex enough to demonstrate the breadth of knowledge and design skills required of the VCDX-EUC 2021 certified individual.

Technical misunderstanding has led to a faulty design that will have significant and detrimental impact on the integrity of the deployed architecture.

The application package is not delivered in the requested formats.

The application package is not submitted on time.

Contents of Candidate Submission

The VCDX-EUC 2021 application form requires the attachment of design documentation on the project. A completed application contains pointers into that documentation, calling reviewers' attention to specific areas. Candidates are encouraged to submit conceptual model diagrams, logical design diagrams, and physical design diagrams, as well as written documentation, using the formats specified in the application.

For purposes of the VCDX-EUC 2021 application, conceptual design, logical design, and physical design are defined as follows:

- o Conceptual model: the mapping of design-client requirements to high-level solution components
- o Logical design: the interrelation of the high-level solution components, omitting hardware details and physical layout
- o Physical design: the physical components of the as-built solution and their physical connections, presented in a manner useful to installation personnel

There is no required minimum page count or word count of an application. In the past, VCDX submissions by successful candidates have typically ranged between 100 and 300 pages, including the application form itself and all diagrams.

The typical submission of a successful candidate meets these criteria:

- o It includes all items required by the VCDX-EUC 2021 application form.
- o It contains sufficient documentation to cover the scope of the project it describes.

- o It addresses all areas of the VCDX-EUC 2021 blueprint.

Candidates do not necessarily serve their own interests by submitting large quantities of material. Being concise and deleting extraneous matter help reviewers focus on the parts most relevant. VMware reserves the right to require the resubmission of applications deemed to contain duplication, needless restatement or elaboration, or unreasonable quantities of non-supportive materials. If an application refers to external resources such as vendor whitepapers, URLs for these documents rather than the documents themselves should be included in the submission.

The application form requires that other contributors to the submitted design are clearly identified and the nature of their contribution explained. If material extracted from a template is included in the design, the candidate must identify that template as a contributor and cite its source.

The submitted design itself does not stand alone. Candidates who, during the defense session, fail to display mastery of the materials in the submission will not receive full marks.

Format and Structure of the Design Defense

Candidates should assume that the defense session's duration will occupy the entirety of a morning or an afternoon. During this session, the candidate will be asked to perform the following tasks:

- o Orally defend the submitted design and respond to questions posed by panelists (75 minutes).
- o Work through a design problem posed by the panelists, in the format of an oral discussion (45 minutes).

These tasks are performed as separate timed sections of the defense. The total time for the defense session, excluding breaks, will be 120 minutes.

Candidates should prepare a short PowerPoint presentation for approximately the first 15 minutes of the defense that provides an executive summary of the design. Important diagrams from the design may be included in this presentation for quick reference. Do not attempt to reproduce every detail of the design in this presentation; focus on what is most relevant to the requirements, constraints, and assumptions underlying the design, as well as your design choices.

The presence of the defense session in the VCDX-EUC 2021 process reflects VMware's belief that VCDX-caliber architects are capable of explaining and defending their design choices. Architects are often required to do so in a format of the design client's choice, not their own. The format of the defense session is intended to provide a common, uniform challenge to candidates that simulates the various forms of defense a real design client might demand of an architect.

VMware does not disclose the precise mechanism by which the defense is scored. Instead, it offers the following guidance to candidates

Design Judgment and Technique

Throughout the defense, show how selections were made among reasonable alternatives, as well as how the final design met requirements and constraints. Identify assumptions. If improper design decisions were made, explain why and how they could have been improved. If typical best practices were contravened, justify the decisions to do so.

Successful Interactive Design Exercise

Respond interactively to a presentation of requirements and constraints to show the ability to produce a design which satisfies a customer's needs.

Languages

All defenses are conducted in English. Candidates should not assume any time extensions for non-native speakers of English.

Scheduling a Defense

Candidates whose applications are accepted will be invited to work with VMware's certification team to select an opportunity to defend. Typically, VMware will publish a list of upcoming opportunities worldwide to defend.

Retake Policy

If a candidate's application is rejected, it may be resubmitted after a certain interval. This interval will vary depending on the deficiencies of the application and is at VMware's sole discretion. Payment of a new application fee will be required with resubmission.

If a candidate's defense is scored as not passing, he or she may reschedule for a future opportunity to defend with the same design already submitted and approved. Payment of a new defense fee will be required.

In either case, the candidate will be told generally which areas of his or her application or defense were insufficient. VMware will not disclose the precise scoring of applications and defenses.

In no case may a candidate have multiple submissions under review at the same time.

Applicant Integrity

VMware reserves the right to refuse certifying a candidate who violates integrity policies. All the following are considered breaches of integrity and are grounds for disqualification or revocation:

- o Presenting others' work as your own or allowing the appearance of plagiarism to arise.
- o Disclosing specific questions asked or exercises presented during the design session, whether orally, by email, Twitter, blogs, or any other form of dissemination.
- o Submitting an application or attempting to present a defense under a false identity.
- o Falsifying professional credentials.

Immediately before beginning their defenses, candidates will have their government- issued photo ID checked.

Successful Candidate Description

The successful VCDX-EUC 2021 candidate holds primary responsibility for gathering and vetting customer requirements to create an architectural design consisting of a proposed VMware desktop and mobility platform solution, configuration recommendations, implementation planning, integration of third-party components, and identification of deployment validation processes and procedures within the Desktop and Mobility technical solution track.

The successful VCDX-EUC 2021 is able to create detailed documentation with a logical structure, can present and defend rationale for a solution, and understands all facets of the design.

The successful VCDX-EUC 2021 candidate will: determine the relevant information required to understand the current customer environment, determine which components to include in a design given a design requirement and data set, identify business requirements given results of

requirement-gathering activities, analyze and determine the impact of the requirements on the design given business requirements, and succinctly and clearly explain the design rationale.

As a top-tier certification the VCDX-EUC 2021 candidate should be able to perform tasks without assistance to a large extent. However, it is recognized that no single individual would know all of the related details outside of the core design (e.g., third- party integrations and their impacts, storage implications); yet they would know impacts and where to locate more information.

Knowledge and Skills

Determine the relevant information required to understand the current customer environment. Know what questions to ask.

Given a design requirement and data set within a multi-site environment, determine which components to include in a design.

Given results of requirement-gathering activities, identify the business requirements.

Given business requirements, analyze and determine the impact of the requirements on the design.

Succinctly and clearly explain design rationale.

Objectives Covered in the VCDX-EUC 2021 Defense

Customer Requirements:

Collect the customer requirements and constraints; map them into one or more infrastructure design qualities, and document risks and assumptions:
Ask probing questions to determine specific requirements and considerations, based on business objectives.

Collect, sort, and validate customer requirements and constraints for Architecture through meetings with key stakeholders.

Clarify any areas that might be ambiguous or prevent development of a complete design.

Document and provide evidence of limited assumptions, including reasoning for its classification as an assumption rather than inclusion as a requirement or constraint.

Availability

Requirements to deliver highly available operation in compliance with SLAs, as measured by percent uptime of relevant components.

Manageability

Requirements for managing the environment and maintaining normal operations. Sub- qualities may include scalability and flexibility.

Performance

Required standards of responsiveness of components of the designed environment.

Requirements to meet expectations or SLAs of responsiveness of components for the designed environment.

Recoverability

Requirements for the ability to recover from an unexpected incident that affects the availability of an environment.

Requirements for the ability to restore components and service within acceptable data and component loss/downtime, from a significant unexpected incident that affects the environment.

Security

Requirements for overall data control, confidentiality, integrity, accessibility, governance, and risk management, often including the ability to demonstrate or achieve compliance with regulation.

Capacity Management and Scalability

Requirements related to capacity management & scalability (e.g., growth requirements, future company expansion).

Constraints

Requirements regarding customers constraints (i.e., cost limitations, pre-purchased hardware, vendor choice).

Solution Architecture:

Build relationship models among the logical design entities to create solutions based on the mapping of requirements, constraints, and assumptions to the following infrastructure design qualities.

Develop and document a complete solution through architectural design that addresses customer requirements and constraints.

Defend design decisions and be able to provide alternative options along with the relative merits and drawbacks of those options.

Articulate solution to stakeholders demonstrating excellent communication skills.

Availability

Considerations and analysis of single points of failure (SPOFs), redundancy options, and accessibility

Maps availability requirements to design and documents risks and assumptions

Manageability

Considerations and analysis of monitoring, administration ease, maintenance, and updates.

Maps manageability requirements to design and documents risks and assumptions

Performance

Considerations and analysis of demand patterns, potential bottlenecks, resource management, and workload balancing.

Maps performance requirements to design and documents risks and assumptions

Recoverability

Considerations and analysis of potential data and component loss, acceptable downtime, and methods for restoring components and services.

Maps recoverability requirements to design and documents risks and assumptions.

Security

Considerations and analysis of permissions, user roles, component access, threat management and mitigation (i.e., data security and loss-prevention), monitoring, update management lifecycle, compliance.

Maps security requirements to design and documents risks and assumptions.

Capacity Management and Scalability

Forecast capacity requirements and design for future growth patterns.

Maps capacity management and scalability requirements to design and documents risks and assumptions.

Engineering Specifications:

Propose detailed specifications for the technology stack, showing the components' mapping to the entities in the physical design.

Platform (vSphere)

Storage

Map storage IO performance and capacity planning to the logical design.

Network

Design for network segmentation, firewalling, load balancing, throughput, latency, and capacity planning.

Presentation (Horizon)

Choose appropriate display protocol in relation to the design requirements (e.g., 3D applications, vGPU, H.264).

Database

Design for highly available dependent management services (Composer, App Volumes, Identity Manager).

Incorporate data retention policies into the design specifications.

Solution Infrastructure

Design access infrastructure (UAG, connection servers, proxies).

Design management infrastructure (monitoring, vCenter).

Design compute infrastructure (capacity planning).

User Data and Experience

Application delivery (mobile, published, native, virtualized, SaaS, user-installed applications) and presentation

Design for appropriate application delivery mechanisms to meet requirements.

User Experience

Provide specifications for optimal user experience (optimizing display protocols, branding)

User Data (local storage, cloud storage)

Design for user access to data.

User Profile (persistence, customization, printing)

Design for user profile management and application settings.

Device Management (thin clients, laptops, mobile devices)

Managed/unmanaged devices (privacy settings, conditional access)

Implement controls based on security posture.

Provisioning of Physical and Virtual Devices

Design an out of box experience (OOBE). Choose between linked and instant clones.

Mobile Device Management

Choose appropriate access device. Optimize operating system

Security and Authentication

Authentication (multi-factor, single sign-on, directory integration and federation) Design identity management for one or more authentication methods.
Compliance

Create a design that complies with legal or industry regulations, or internal organizational policies.

External Access

Create a design that allows for secure remote access (i.e., roaming, conditional access, and access policies).

Network Security

Create a design that meets network security requirements (i.e., routing, ACLs, firewalls, micro-segmentation).

Antivirus and Anti-Malware

Design an antivirus and anti-malware solution that meets requirements.
Design a monitoring plan for antivirus and anti-malware solution (i.e., integrity of client devices).

Implementation Guidance:

The requirement that implementation guidance be included in VCDX-EUC design submissions reflects VMware's belief that VCDX-caliber enterprise architects are aware of, and respond to, the challenges of documenting, deploying and managing their designs.

The ability to create documentation and processes to implement the infrastructure as designed, validate that it was implemented correctly, and maintain and operate it post- implementation.

Implementation plan

Create a workable plan for moving from hardware and software components to a deployed system that could be handed off to other personnel.

Supply a workable plan for implementing the solution as designed.

Installation guide

Define installation procedures for use by other personnel.

Document installation procedures to implement the design as architected.

Generate documentation that is detailed enough for VCP-level personnel to implement the design

Operational procedures

Define routine operational procedures for use by other personnel.

Document standard operational procedures for VCP-level personnel to operate and maintain the environment.

Test/validation plan

Define a test/validation plan that confirms the customer's requirements were met, confirms the design functions as intended, and that is appropriate for VCP-level personnel to execute.

The requirement that risk management guidance be included in VCDX-EUC design submissions reflects VMware's belief that VCDX-caliber enterprise architects should identify and provide plans to mitigate risks inherent in their designs.

Identify and provide validated plans to mitigate risks inherent in the design.

Risk Management

Determine and identify inhibitors to successful implementation, operation, and functionality of the design.

Explain identified risks to business and technical audiences, along with options for avoidance or mitigation and the benefits and drawbacks for each.

Risk mitigation (planning)

Document plans to address, mitigate, and/or eliminate risks in the design. Provide thoughtful solutions to mitigate risk in the design.

Validation of risk management

Provide procedures for mitigating and or/resolving identified risks that are appropriate for VCP-level personnel to complete. Validate that procedures for mitigating identified risks were successful.

Technical Communication (defense):

Succinctly and clearly explain design rationale via written, verbal, and visual communication.

Receive and act upon constructive criticism and be able to adapt to change.

Construct appropriate and relevant questions that garner information appropriate for the design

Additional Resources

VCDX Community

VMware provides an online community for VCDX candidates. This community contains valuable information from other candidates and existing VCDX personnel.

Building a VMware vSphere/Horizon Test Environment

All VMware products, including VMware vSphere 7.x and Horizon, can be downloaded and evaluated for a limited time. If you have the equipment to install a copy of ESXi, you can install it in a VM. This would allow you to install multiple copies of ESXi and a copy of vCenter Server. For shared storage, you may use VMware vSAN or download a virtual appliance that contains an iSCSI target (several are available on the Download Center.)

Mentors

Several current VCDX's are willing to provide mentoring, based on their availability. They can provide suggestions, guidance, and support in practicing for a defense. You can find VCDX mentors on the VCDX Directory and contact them directly.

Please note that VCDX Panelists are not allowed to mentor candidates, since they have access to the scoring rubrics and other inside information that may create a conflict of interest.

Defense Rehearsal

Candidates who are invited to defend should rehearse before their appearance. Here are guidelines for making this rehearsal most effective.

- Make your presentation to an audience of people who understand VMware technology and design processes.

- Require that your audience read your submission before the session.
- Encourage audience members to ask questions at any time during your presentation.
- Encourage audience members to demand justification of why important decisions were made.
- Have a whiteboard at your disposal and make frequent use of it. You can also direct audience members to look at particular pages in your submission.
- Manage your time. Enforce a strict 75 minute time limit.
- All discussion should be in English.

Disclaimer

This blueprint is intended to provide information about the objectives covered by the VMware Certified Design Expert - End-User Computing Design Defense exercise and related resources. The material contained within this blueprint is not intended to guarantee that a passing score will be achieved on the Design Defense exercise. VMware recommends that a candidate thoroughly understand the objectives indicated in this guide and utilize the resources and courses recommended in this guide where needed.

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