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VMWARE CERTIFIED DESIGN EXPERT 7 – CLOUD MANAGEMENT & AUTOMATION

Design Defense Blueprint v1.1

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The VMware Certified Design Expert 7 – Cloud Management & Automation (CMA) is an advanced certification developed for architects of VMware vRealize Automation, VMware vCloud Director, or VMware vSphere Integrated OpenStack based solutions. The VCDX7-CMA certification validates a candidate's ability to design, implement, document, and test scalable, complex, single and multi-tenant public/private/hybrid VMware Cloud Management platforms that meet specific customer business objectives.

Goals of the VCDX7-CMA Program

- 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 Cloud Management platforms.
- 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 cloud environments.
- 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

- Publically recognized credential validating advanced level of competence in VMware vCloud Management & Automation Suite-based designs
- Distinction for organizations with VCDX-certified professionals
- Increased customer confidence in designs delivered by VCDXs
- Membership in an elite community of practice

Intended Audience

In his or her typical job role, the successful VCDX7-Cloud Management & Automation candidate holds primary responsibility for the architectural design of VMware Cloud Management platforms including configuration recommendations, programmability and automation, integration of third-party components, implementation planning, and deployment validation processes and procedures. The VCDX7-CMA will create a Cloud-based solution addressing availability, manageability, performance, recoverability, and security design elements meeting the requirements of the customer.

- No specific number of years of experience in vCloud Management & Automation solution design is required.
- Candidates are not required to be employed by particular types of companies.
- No specific higher-education requirement is made.
- No specific job role or job title is required.

Certification Requirements

Achieving the VCDX7-CMA certification requires the following steps:

- For new candidates:
    - Earn the VMware Certified Professional 7 – Cloud Management & Automation (VCP7-CMA) certification
    - Earn the VMware Certified Implementation Expert 7 – Cloud Management & Automation Design (VCIX7-CMA) badge
        - The badge is earned by earning both the VMware Certified Advanced Professional 7 – Cloud Management & Automation Design (VCAP7-CMA Design) and the VMware Certified Advanced Professional 6 – Cloud Management & Automation Deployment (VCAP6-CMA Deploy) certifications
        - Note: for upgraded VCIX badges from a previous version, the VMware Certified Advanced Professional 7 – Cloud Management & Automation Design (VCAP7-CMA Design) is required
    - Have the VCDX7-CMA application package approved and be invited to defend
    - Successfully pass the VCDX7-CMA 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-Cloud or VCDX-CMA candidates:
    - Pass the VCAP7-CMA Design exam
- For existing VCDXs in other tracks:
    - Earn the VMware Certified Implementation Expert 7 – Cloud Management & Automation Design (VCIX7-CMA) badge (for upgraded VCIX badges from a previous version, the VCAP7-CMA Design is required)
    - Have the VCDX7-CMA application approved and be invited to defend
    - Successfully pass a remote one-hour VCDX7-CMA defense

The VCDX7-CMA Application and Design

After a brief sketch of the candidate's professional qualifications, the application provides an overview of a VMware Cloud-based 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 VCDX7-CMA 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 VCDX7-CMA 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 VCDX7-CMA application, *conceptual design*, *logical design*, and *physical design* are defined as follows:

- Conceptual model: the mapping of design-client requirements to high-level solution components
- Logical design: the interrelation of the high-level solution components, omitting hardware details and physical layout
- 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:

- It includes all items required by the VCDX7-CMA application form.
- It contains sufficient documentation to cover the scope of the project it describes.
- It addresses all areas of the VCDX7-CMA 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:

- Orally defend the submitted design and respond to questions posed by panelists (75 minutes).
- 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 VCDX7-CMA 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:

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

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

Successful Candidate Description

The successful VCDX7-CMA candidate holds primary responsibility for gathering and vetting customer requirements to create an architectural design consisting of a proposed VMware Cloud Management platform solution, configuration recommendations, implementation planning, integration of third-party components, and identification of deployment validation processes and procedures within the Cloud Management & Automation technical solution track.

The successful VCDX7-CMA 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 VCDX7-CMA 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 VCDX7-CMA 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 VCDX7-CMA Defense

Customer Requirements:

Collect the customer requirements and constraints; map them into one or more scalable infrastructure design qualities, and document risks and assumptions:

Availability

Requirements to deliver highly available operation in compliance with SLAs.

Manageability

Requirements for managing the environment and maintaining normal operations. Sub-qualities include scalability, lifecycle management, organization/process, and capacity management.

Performance

SLA requirements and/or expectations for performance characteristics of the designed environment.

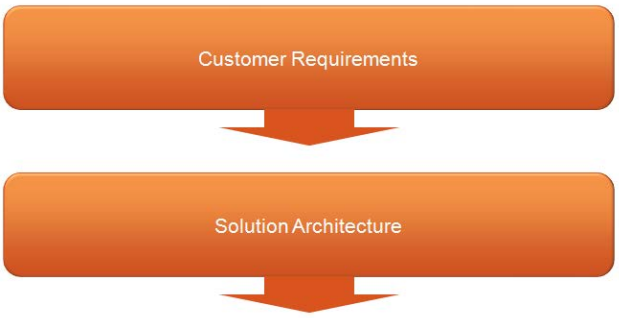
Recoverability

Requirements for restoring service 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.

Solution Architecture:



Formulate a complete, tailored solution that addresses requirements and constraints. Build relationship models among the design entities to create solutions based on the mapping of requirements, constraints, assumptions, and risks to the following infrastructure design qualities:

Availability

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

Manageability

Considerations and analysis of monitoring, administration ease, maintenance, updates, scalability and capacity planning

Performance

Considerations and analysis of demand patterns, potential bottlenecks, resource management, capacity planning, scalability for future growth, and workload balancing

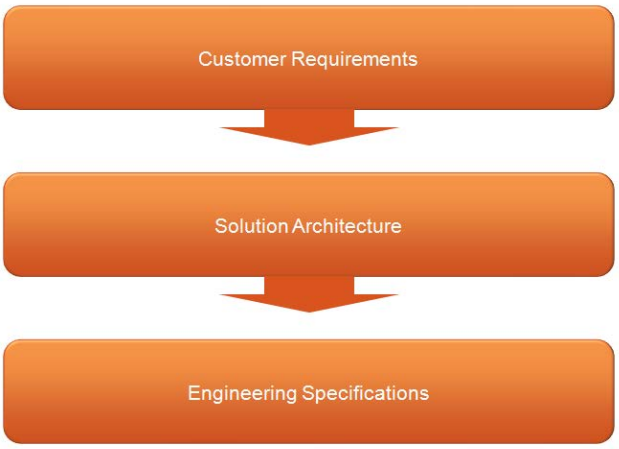
Recoverability

Considerations and analysis of potential data and component loss, acceptable downtime, and methods for restoring components and services, time associated with restoring, and level of effort

Security

Considerations and analysis of permissions, user roles, component access, network security, monitoring, zones of trust, and defense-in-depth

Engineering Specifications:



Propose detailed specifications for the technology stack, showing the mapping of the components to infrastructure design qualities in the logical and physical design.

Cloud Management Infrastructure

Specifies Cloud Management platform component sizing and configuration for all the management components (compute, network, storage, and security resources) supporting the business requirements of the solution

Cloud Resource Infrastructure

Specifies Cloud Resource infrastructure sizing and configuration for the compute, network, storage, and security resources supporting the business requirements of the solution

Automation and Extensibility

Specifies service lifecycle management, extensibility, and automation as needed to support the business requirements of the solution

Implementation Guidance:

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

Supply a workable plan for implementing the solution as designed.

Installation guide

Document installation procedures to implement the design as. Documentation should be detailed enough for a VCP to implement the design.

Operational procedures

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

Test/validation plan

Define and perform a test/validation plan that confirms the design functions as intended.

Risk Management:

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

Risk identification

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

Risk mitigation

Document plans to address, mitigate, and/or eliminate risks in the design.

Validation of risk management

Validate that procedures for mitigating identified risks were successful.

Technical Communication:

Design Judgment and Technique

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

Demonstrate how selections were made among reasonable alternatives, as well as how the final design met requirements and constraints.

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

Construct appropriate and relevant questions that garner information that is put into action.

Explain why and how design decisions could have been improved.

Successful Customer Interaction

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

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/vCloud Test Environment

All VMware products, including VMware vSphere 6.x and NSX, 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 Solutions Exchange.)

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 – Cloud Management & Automation 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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