

VCP-VCF ARCHITECT DESIGN EXERCISES · EXAM 2V0-13.25

Work exercise 1 to exercise 158 and you have designed a VCF 9.0 private cloud on paper

Exam 2V0-13.25, VMware Cloud Foundation 9.0 Architect. This exam tests design, not operation: its twenty objectives sit in sections 1, 2 and 3 of the blueprint, and sections 4 and 5 have no testable objectives at all. Every exercise below produces a written artefact. The code at the right of each one is the objective it practises.

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A. BUSINESS AND TECHNICAL REQUIREMENTS

The first objective, and the distinction every later one depends on.

1. Take a real project you worked on and write ten statements the customer actually made, in their words. 1.1
2. Classify each of the ten as a business requirement or a technical requirement, and defend the ones you found hard to place. 1.1
3. Write the one-line test you used to decide, so you can apply it in seconds under exam pressure. 1.1
4. Find a statement that sounds like a requirement but is really a solution, and rewrite it as the need behind it. 1.1
5. Write a requirement that cannot be measured, then rewrite it so it can be verified. 1.1

B. CONCEPTUAL MODEL, LOGICAL DESIGN, PHYSICAL DESIGN

Three layers that the exam expects you to tell apart from a single sentence.

6. Write one sentence defining each of the three layers, and what each one deliberately leaves out. 1.2
7. Take one component, the network, and describe it at all three layers. 1.2
8. Sort twenty design statements into conceptual, logical or physical, and note any that sit on a boundary. 1.2
9. Find a logical design statement that names a product or a number, and move the detail to where it belongs. 1.2
10. Write why a conceptual model contains no product names, and what goes wrong when it does. 1.2

C. REQUIREMENTS, ASSUMPTIONS, CONSTRAINTS, RISKS

Plus dependencies, which the candidate profile names alongside them.

11. Classify your ten statements as requirement, assumption, constraint or risk. Several will move from section A. 1.3
12. Write the one-line test for each of the four. 1.3
13. Take three constraints and write what each one removes from the design space. 1.3
14. Take three assumptions and write what happens to the design if each proves false. 1.3
15. List the dependencies in a VCF design that sit outside your control, such as DNS, NTP and the physical network, and who owns each. 1.3
16. Find a statement in your list that is two things at once, and split it. 1.3

D. AMPRS

Availability, manageability, performance, recoverability and security. The vocabulary the whole exam is written in.

17. Define each of the five qualities in one sentence, without using the word itself. 1.4
18. Classify twenty requirements from a scenario against the five, and note any that belong to none. 1.4
19. Write what separates availability from recoverability, with a design that has one and not the other. 1.4

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| 20. | Take one design decision and write its effect on all five qualities, including the ones it harms. | 1.4 |
| 21. | Find two qualities that conflict in a real design, and write how you resolved it. | 1.4 |

E. RISK MITIGATION STRATEGY

Not just naming risks: deciding what to do about each and who owns it.

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| 22. | Write the four responses to a risk: avoid, mitigate, transfer, accept. Give a VCF example of each. | 1.5 |
| 23. | Take five risks from a VCF design and score each for impact and likelihood. | 1.5 |
| 24. | Write a mitigation for each, with an owner and the trigger that tells you the risk has occurred. | 1.5 |
| 25. | Convert an unprovable assumption into a risk, and write its mitigation. | 1.5 |
| 26. | Produce a one-page risk register for a small VCF design, ready to review at a design gate. | 1.5 |

F. DESIGN DECISIONS

The skill the exam tests most often, in every section, from every angle.

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| 27. | Write a design decision in a fixed structure: decision, justification, implication, and the requirement it serves. | 1.6 |
| 28. | Take ten decisions from a past design and rewrite them all in that structure. | 1.6 |
| 29. | Trace each decision back to a requirement, constraint or assumption. Delete any that trace to nothing. | 1.6 |
| 30. | Write the implications of three decisions, including what each rules out later. | 1.6 |
| 31. | Write a decision whose implication creates a new risk, and record the risk. | 1.6 |
| 32. | Write the alternative you rejected for one decision, and why. | 1.6 |

G. DESIGN VALIDATION

How you prove the design meets the requirements before anyone builds it.

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| 33. | Write what a design validation strategy contains and who it is for. | 1.7 |
| 34. | Take ten requirements and write the test that proves each one is met. | 1.7 |
| 35. | Separate the checks you can make on paper from the ones that need the built platform. | 1.7 |
| 36. | Write the entry and exit criteria for validation, so done has an agreed meaning. | 1.7 |
| 37. | Produce a requirement to test traceability matrix for a small design. | 1.7 |

H. VCF ARCHITECTURE OPTIONS

Section 2 is a single objective: given a scenario, pick the architecture. Build the comparison before you need it.

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| 38. | Write what a VCF fleet, a VCF instance and a domain are in VCF 9.0, and how they nest. | 2.1 |
| 39. | Write which components sit at fleet level and which sit inside every instance. | 2.1 |
| 40. | Write the difference between a consolidated and a standard architecture, and the point at which you move from one to the other. | 2.1 |

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| 41. | Given a single site with 150 workloads and a small team, choose an architecture and justify it in three sentences. | 2.1 |
| 42. | Given two regions with a data residency requirement, choose an architecture and justify it. | 2.1 |
| 43. | Write the paths into VCF 9.0: a new deployment, converging an existing vSphere estate, and importing one. Say when each fits. | 2.1 |
| 44. | Write when a second VCF instance is the right answer and when another workload domain is. | 2.1 |
| 45. | Write what changes if a second site is added later rather than planned from the start. | 2.1 |

I. DISCOVERY AND THE CONCEPTUAL MODEL

Section 3 begins here. Everything downstream is only as good as this.

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| 46. | Write the ten questions you would ask in a first discovery workshop, in order. | 3.1 |
| 47. | Take a one-page customer brief and extract every requirement from it, numbered. | 3.1 |
| 48. | Write what the brief does not say that you must ask before designing. | 3.1 |
| 49. | Write the business objectives behind the requirements, in the customer language rather than yours. | 3.1 |
| 50. | Prioritise the requirements as must, should and could, and record who agreed it. | 3.1 |
| 51. | Produce a conceptual model for the brief: entities, relationships and the qualities each needs. | 3.2 |
| 52. | Map every business objective to an element of the conceptual model. | 3.2 |
| 53. | Write the questions the conceptual model raises that the logical design must answer. | 3.2 |

J. PREREQUISITES FOR VCF

The first sub-objective of both 3.3 and 3.4. Most failed bring-ups are a prerequisite somebody missed.

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| 54. | List every prerequisite for a VCF 9.0 deployment: DNS, NTP, networks, hosts, licences, software depot. | 3.3 |
| 55. | Write the DNS records a management domain needs, forward and reverse, and who will create them. | 3.4 |
| 56. | Write the networks and address ranges bring-up needs, with VLAN, subnet, gateway and MTU for each. | 3.4 |
| 57. | Write how you confirm the hosts are supported before you order them. | 3.4 |
| 58. | Given a scenario where one prerequisite cannot be met on time, write the decision and the risk. | 3.3 |

K. FLEET TOPOLOGY

Logical first, then physical: how many instances, where, and what is shared.

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| 59. | Draw the logical fleet topology for a single-site customer. | 3.3 |
| 60. | Draw the logical fleet topology for a customer with two regions and a third, smaller site. | 3.3 |
| 61. | Write which fleet-level components you deploy once and where they live. | 3.3 |
| 62. | Write the physical placement of the fleet-level components: which instance, which cluster, which site. | 3.4 |
| 63. | Write what the fleet loses if the site hosting the fleet-level components is lost. | 3.4 |

64. Write the design decisions for single sign-on across the fleet, and where the identity source lives. 3.3

L. NETWORK INFRASTRUCTURE

The physical network VCF sits on. Outside your platform, inside your design.

65. Write the logical network infrastructure: which traffic types exist and which must be separated. 3.3
66. Decide where the layer 3 boundary sits, at the top of the rack or above it, and justify it. 3.3
67. Write the physical design: switches per rack, uplinks per host, and how a switch failure is survived. 3.4
68. Write the MTU requirement for every network and where it must be set end to end. 3.4
69. Write the VLAN and subnet plan for one management domain and one workload domain. 3.4
70. Write the routing design between the edges and the physical network, and who configures the physical side. 3.4

M. MANAGEMENT DOMAIN

The domain that runs everything else, so it is sized and protected before anything else.

71. Write what runs in the management domain in VCF 9.0, appliance by appliance. 3.3
72. Write the decision on whether the management domain also runs workloads, against a scenario. 3.3
73. Size the management domain: appliance sizes, total resources, and host count with spare capacity shown. 3.4
74. Write the storage design for the management domain and why. 3.4
75. Write what grows the management domain as the estate grows, and when you would add hosts to it. 3.4
76. Write the availability design for the management components themselves. 3.3

N. WORKLOAD DOMAINS

When to separate, when to add a cluster, and what each choice costs.

77. Write the reasons that justify a new workload domain, and the reasons that only justify a new cluster. 3.3
78. Given three customer workload groups, decide how many workload domains you need and justify it. 3.3
79. Write the decision on a shared or a dedicated NSX Manager for a workload domain. 3.3
80. Size one workload domain: hosts per cluster, cluster count, and the calculation behind it. 3.4
81. Write the principal storage choice for a workload domain, vSAN or external, and the reason. 3.4
82. Write the decision for a workload domain that needs GPU hosts, and what it changes. 3.4

O. VCF NETWORKING

NSX design. Expect more of these items than you think: networking runs through every scenario.

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| 83. | Write the logical NSX design for one instance: edge cluster, Tier-0, Tier-1 and segments. | 3.3 |
| 84. | Decide between active-active and active-standby for the Tier-0 gateway, against a scenario with stateful services. | 3.3 |
| 85. | Write when virtual private clouds suit the design better than segments created by the platform team. | 3.3 |
| 86. | Size the edge cluster: node count, node size, and the reason for each. | 3.4 |
| 87. | Write the physical placement of the edges, and what happens when an edge host fails. | 3.4 |
| 88. | Write the east-west security design using the distributed firewall. | 3.3 |
| 89. | Write the decision on load balancing: which load balancer and why. | 3.4 |

P. VCF AUTOMATION DESIGN

Logical and physical design for the consumption layer.

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| 90. | Write the logical VCF Automation design: provider, organizations, regions and projects. | 3.3 |
| 91. | Decide between All Apps and VM Apps organizations for a scenario, and justify it. | 3.3 |
| 92. | Write the deployment model you choose, single node or highly available, and its cost in the management domain. | 3.4 |
| 93. | Write which vCenters and clusters each region exposes, and why. | 3.4 |
| 94. | Write what happens to consumers when VCF Automation is unavailable, and whether that is acceptable. | 3.3 |

Q. VCF OPERATIONS DESIGN

Logical and physical design for the operations layer.

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| 95. | Write the logical VCF Operations design: what it monitors, manages and reports on across the fleet. | 3.3 |
| 96. | Size VCF Operations for a stated number of objects, with node count and size. | 3.4 |
| 97. | Write where collectors go in a multi-site design, and why they sit close to what they collect. | 3.4 |
| 98. | Write the decision on VCF Operations for logs: retention, sizing and placement. | 3.4 |
| 99. | Write when VCF Operations for networks is needed, and what it adds. | 3.3 |

R. DESIGN FOR AVAILABILITY

Two sub-objectives: availability within one availability zone, and across zones.

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| 100. | Write the availability requirement as a number, and state what it is measured against. | 3.5 |
| 101. | Design cluster sizing and HA admission control to survive a host failure, with the capacity cost shown. | 3.5 |
| 102. | Design vSAN fault domains to survive the loss of a rack inside one zone. | 3.5 |
| 103. | Write when a stretched cluster is the right answer and when it is not. | 3.5 |

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| 104. | Design a stretched cluster across two zones: the witness, the storage policy, and the network between them. | 3.5 |
| 105. | Design availability for the management domain across zones, not only for workloads. | 3.5 |
| 106. | Write the single points of failure left in your design, and whether each is accepted or mitigated. | 3.5 |
| 107. | Write what your design does when a whole zone is lost, step by step. | 3.5 |

S. DESIGN FOR MANAGEABILITY

Three sub-objectives: lifecycle, scalability and capacity management.

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| 108. | Write the lifecycle approach: what is upgraded by which tool, and in what order across the fleet. | 3.6 |
| 109. | Write the decision on cluster images and how hardware firmware is kept in step. | 3.6 |
| 110. | Write the maintenance window design, including what is disrupted during an upgrade. | 3.6 |
| 111. | Write the units the design grows in, hosts, clusters, domains or instances, and the trigger for each. | 3.6 |
| 112. | Check your design against published maximums and record where you are closest to one. | 3.6 |
| 113. | Design capacity management: what is forecast, the headroom kept, and the lead time it must give. | 3.6 |
| 114. | Write the manageability cost of three decisions you have made elsewhere in the design. | 3.6 |

T. DESIGN FOR PERFORMANCE

One sub-objective, examined through scenarios. Numbers, and the evidence behind them.

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| 115. | Write the performance requirements in a scenario as measurable figures, not adjectives. | 3.7 |
| 116. | Size compute for them, stating the consolidation ratio you assumed and why. | 3.7 |
| 117. | Design storage to meet a stated latency requirement, and write which choice made the difference. | 3.7 |
| 118. | Design the network for a stated throughput requirement, including east-west traffic. | 3.7 |
| 119. | Write the first bottleneck the design would hit under growth, and when. | 3.7 |

U. DESIGN FOR RECOVERABILITY

Business continuity and disaster recovery, for management components and workloads separately.

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| 120. | Write the difference between business continuity and disaster recovery, in one sentence each. | 3.8 |
| 121. | Write the recovery strategy for management components and the one for workloads, and why they differ. | 3.8 |
| 122. | Design file-based backup for the management components: what, where, how often and how long kept. | 3.8 |
| 123. | Write the restore order for the management components after a total loss. | 3.8 |
| 124. | Write recovery point and recovery time objectives per workload tier, as numbers. | 3.8 |
| 125. | Design workload disaster recovery between sites to meet those numbers. | 3.8 |

126. Write how and how often recovery is tested. 3.8

V. DESIGN FOR SECURITY

One sub-objective with two halves: management components and workloads.

127. Extract the security and compliance requirements from a scenario, including those implied by the industry. 3.9
128. Design access to the management components: identity source, roles, and who may do what. 3.9
129. Design certificate management across the fleet, including renewal. 3.9
130. Design workload segmentation with the distributed firewall, and say where each rule is enforced. 3.9
131. Design encryption: what is encrypted at rest and in transit, and where the keys live. 3.9
132. Write the residual security risks and who accepted them. 3.9

W. WORKLOAD MIGRATION AND ONBOARDING

Getting the existing estate into VCF, which the scenario almost always contains.

133. Write the migration options into VCF 9.0 and when each fits: converge, import, HCX, cold migration. 3.10
134. Given an existing vSphere estate, decide between bringing it under VCF and migrating off it. 3.10
135. Group a set of workloads into migration waves by dependency. 3.10
136. Write the network decision: extend layer 2 during migration, or re-address. 3.10
137. Write the rollback plan for one wave. 3.10
138. Write the onboarding step that makes migrated workloads visible to automation and operations. 3.10

X. CONSUMPTION STRATEGY

Four sub-objectives: tenant design, self-service and governance, automating infrastructure, modern applications.

139. Write who consumes the platform and in what units: virtual machines, namespaces, applications. 3.11
140. Design the tenant model: organizations, projects, and the boundary between tenants. 3.11
141. Design the self-service catalogue and what consumers may and may not change. 3.11
142. Design quotas, approvals and the policy when a quota is exhausted. 3.11
143. Write the decision on automating infrastructure components through APIs and infrastructure as code, and who owns the code. 3.11
144. Design for modern applications: Supervisor, namespaces and VKS clusters per team. 3.11
145. Write the decision on Supervisor networking and load balancing for a scenario. 3.11
146. Design a Supervisor that survives the loss of a zone, and what it needs. 3.11

Y. MONITORING STRATEGY

The last objective: management components and workloads, as two separate designs.

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| 147. | Write what monitoring must answer for the management components, and for whom. | 3.12 |
| 148. | Design what is collected from the management components, at what interval, and how long it is kept. | 3.12 |
| 149. | Design monitoring for workloads: performance, capacity and the owner who sees it. | 3.12 |
| 150. | Design alerting: which conditions page someone, which raise a ticket, and which only inform. | 3.12 |
| 151. | Write how monitoring proves each AMPRS quality is met in production. | 3.12 |

Z. A FULL DESIGN, AGAINST THE CLOCK

Do this section twice in the final week, from a scenario you have not seen before.

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| 152. | From a one-page brief, extract and number every requirement, assumption, constraint, risk and dependency. 20 minutes. | 1.3 |
| 153. | Produce the conceptual model. 15 minutes. | 3.2 |
| 154. | Choose the architecture and draw the fleet topology. 15 minutes. | 2.1 |
| 155. | Write the logical design: management domain, workload domains, networking, Automation, Operations. 30 minutes. | 3.3 |
| 156. | Write the physical design with sizing shown. 30 minutes. | 3.4 |
| 157. | Write the availability, recoverability and security design. 30 minutes. | 3.5 |
| 158. | Write fifteen design decisions with justification and implication, and present them to someone who will challenge them. | 1.6 |