VCAP/VCDX Boot Camp

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VMware, Inc.
Agenda

Three part series

• Part 1 – Program and Process
• Part 2 – Design Scenario
• Part 3 – Troubleshooting Scenario
• Next Steps and Drawing
Introductions

- **Presenters**
  - John Arrasjid, Principal Architect, 10 years at VMware
    - VCDX-001, vCAT Lead Architect
  - Michael Webster, Strategic Architect APJ
    - VCDX-066, Business Critical Applications

- **Attendees**
  - Requirement: VCP or higher cert
    - Architects
    - Administrators
    - Other?

- **Incentives for active participation**
  - Drawing for new VCDX Boot Camp book
VCAP/VCDX Boot Camp
Part 1 of 3

Program and Process
What is the VCDX Certification?

VCDX is the highest tier of technical certification offered by VMware®.

• Beyond VMware Certified Profession (VCP) certification
• Beyond VMware Certified Advanced Professional (VCAP) certifications
• Differentiated from administration skills – VCDX focuses on architectural design skills
• We now offer three tracks for VCDX: Datacenter Virtualization, Desktop, Cloud

Why should you pursue VCDX certification?

• To validate your capability to plan and design a VMware virtual infrastructure environment
• To increase your value to customers and employers
VMware Certification Program

Achievement Levels

- Expert (VCDX)
- Advanced Professional (VCAP)
- Professional (VCP)

Solutions
Designed to reflect real world IT environment

- Datacenter Virtualization
- End User Computing
- Cloud Application Platform
- Cloud

Role based Certifications
System Administrator, IT Architect, Developer, Governance
Pathways to VCDX Certification – DRAFT (TBD)

Cloud
- VCDX-Cloud
- VCAP-CIA
- VCAP-CID
- VCP-Cloud

Datacenter Virtualization
- VCDX-DV
- VCAP-DCA
- VCAP-DCD
- VCP-DV

Desktop
- VCDX-DT
- VCAP-DTA
- VCAP-DTD
- VCP-DT
Review the contents of the VCDX Blueprint.
Demonstrating Design Experience & VCDX Tips
What Demonstrates Design Expertise?

Demonstrate mastery of design considerations and rationales by:

- Identifying and understanding business requirements
- Identifying constraints and risks
- Understanding different enterprise architecture strategies
- Making and justifying sound decisions, understanding the impacts of your design choices
- Understanding of all aspects of design, including the risks inherent to various design choices

During your design defense you should be able:

- To provide a complete solution that addresses all requirements, constraints, and risks
- To answer all questions about your design and defend your design decisions
- To effectively manage your time
  - Demonstrates your ability to work effectively in design meetings with customers
What Demonstrates a Lack of Design Expertise?

Insufficient Mastery of Design Skills is demonstrated by:

• A design that primarily focuses on delivery from templates without addressing business requirements or design rationale

• A candidate that cannot articulate design strategies during the defense
  • The candidate cannot understand or consider major aspects of a design
  • The candidate cannot logically defend questions pertaining to a design decision

• A candidate that cannot start a design process in front of a customer

• A candidate that cannot troubleshoot potential design or implementation issues
Additional Tips

What to do

• Structure in your thoughts, requirements gathering, and problem solving
• Respect time constraints
  • Know where your key material is located in the doc set
  • Include supporting information in your presentation
  • Keep answers clear and to the point
  • If you clearly understand a concept be succinct in your explanations
• Have others review your design
• Practice explaining your design in English
• Think critically about your design

What not to do

• Don’t bring props (like posters)
• Don’t bring gifts for the panelists
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.

The design you submit may be partially fictitious
- You must defend fictitious components as if they were real

If your design is based on an actual project, you must have played an architect role in that project
- But not necessarily the sole architect

The primary design component will be based on the VCDX path chosen
VCDX Process

Candidate submits application

- Complete and well-formed?
  - Yes: Candidate pays application fee
  - No: VMware performs technical review

Candidate pays application fee

- All work by others in application credited?
  - Yes: VMware performs technical review
  - No: Material chance of success at defense?
    - Yes: Application is rejected
    - No: Candidate pays defense fee

Candidate pays defense fee

- Candidate fully knows and understands application?
  - Yes: Candidate can explain pros/cons and tradeoffs?
    - Yes: Candidate reveals skills in all blueprint areas?
      - Yes: Candidate passes
      - No: Candidate fails
    - No: Candidate's technical understanding matches application?
      - Yes: Candidate passes
      - No: Candidate reveals skills in all blueprint areas?
        - Yes: Candidate passes
        - No: Candidate fails
  - No: Candidate defends

Candidate defends

- Candidate can explain pros/cons and tradeoffs?
  - Yes: Candidate's technical understanding matches application?
    - Yes: Candidate reveals skills in all blueprint areas?
      - Yes: Candidate passes
      - No: Candidate fails
    - No: Candidate passes
  - No: Candidate's technical understanding matches application?
    - Yes: Candidate reveals skills in all blueprint areas?
      - Yes: Candidate passes
      - No: Candidate fails
    - No: Candidate passes

Application is rejected

Candidate passes

Candidate fails
VCDX Application – Components

- Completed Application Form
- Signed Attestation and Statement of Conduct
- Mandatory documentation
  - Architectural design
  - Installation guide
  - Implementation plan
  - Testing plan
  - Standard operating procedures
- Registration Fee

Ensure that your submission is free of technical inconsistencies!
VCDX Interview Day

- Approved applicants are invited to interview
  - The interview is an on-site meeting with a panel of VCDX certified architects

- The interview process consists of three parts
  1. The VCDX Defense (75 minutes)
     - Deliver a short (~15 minute) presentation that introduces your design
     - Answer questions from panelists about the design you submitted
     - Provide further insight into your design decisions and rationales
  2. The Design Scenario (30 minutes)
     - Demonstrate that you can begin to work through design issues in a methodical and logical manner
  3. The Troubleshooting Scenario (15 minutes)
     - Demonstrate that you can begin to work through design or operational problems in a methodical and logical manner
The VCDX Defense – Format

- **Panel**
  - 3 Panelists – VCDX certified, interact with candidate, record scores
  - 1 Facilitator – ensures rules and timelines are adhered to
  - Observers – VCDX certified, learning how to conduct defense, no interaction with candidate

- **Environment**
  - Room with whiteboard, 1-2 projectors, and presentation laptop
    - Personal laptops or PDAs not permitted in room
    - Bags stored in secured area
  - Timer (only pauses between sections)
VCDX Defense – What we’re looking for

From Conceptual Requirements to Logical Model

• Collect customer requirements/constraints/assumptions
• Map the above into one or more infrastructure design qualities
  • Availability
  • Manageability
  • Performance
  • Recoverability
  • Security
  • Risk Management
• Build relationship models among design entities to create solutions based on these mappings
Logical
16 blades maximum capacity
VCDX Defense – What we’re looking for

From Logical Design to Physical Design

• Propose detailed specifications for the technology stack, showing the components’ mapping to the entities in the logical design.
  • Virtual Machines
    • Including backup/recovery
  • Compute Resources
    • Including hosts and clusters
  • Storage Resources
    • Considerations of backup/recovery or replication methods of VMs and hosts
  • Network Resources
  • Virtual Infrastructure Management
Sample Physical Design – remember to include in presentation

**Logical**
16 blades maximum capacity

**Physical**
8 blades maximum capacity
Candidate Characteristics

- At all times, show a mastery of

Implementation Guidance

Risk identification and risk mitigation

Complete, clear, organized technical communication
VCDX Defense – Tips

- **Before your defense session…**
  - Make a commitment & budget prep time
  - Minimum of 30-40 hours to complete the application and supporting documentation (not including the design itself)
  - Complex designs can take 300+ hours total
  - Consider forming a study group
  - Know your design thoroughly!
    - Review your design beforehand so that it is fresh on your mind

- **During your defense session…**
  - Use your time wisely & allow for time in all design areas

- **Talk and think out loud**

- **Use diagrams frequently**
Mock Defense Study Sessions
Planning study sessions and a mock defense

- **Study Sessions**
  - Identify other candidates
  - Study sessions focus on design content, design defense, and scenarios
    - Review designs for alignment with VCDX blueprints
    - Panelists present the defense presentation
    - Q&A on design areas
    - Use these slides to simulate the scenarios
  - Note: VCDX panelists are not permitted to review or comment on designs outside of VCDX defense reviews or as part of their work assignments

- **Mock defense**
  - Use similar environment (white board and projector) and timing
  - Have one person manage the clock and simulate the moderator
  - Have three people (if possible) act as panelists – review design and create questions for candidate
  - No time extensions. Focus on questions tied to design and VCDX blueprint
Room Setup to Simulate Defense

**Agenda**

- VCDX Design Defence: 75 minutes
- Design Scenario: 30 minutes
- Troubleshooting Scenario: 15 minutes

**Diagram:**
- Moderator
- Panelists
- Whiteboard
- Projector
- Water
- Candidate

**Notes:**
- Certification: Industry leading certification programs to demonstrate your expertise.
Resources

- **Upcoming VMware Press book (Q1 2013)**
  - VCDX Panel Defense, A Virtual Boot Camp
  - Based on this VCDX boot camp including:
    - Sample Scenarios for VCDX-DV, VCDX-DT, and VCDX-Cloud with analysis
      - 4 sample Design Scenarios
      - 4 sample Troubleshooting Scenarios
    - Details on preparing for the defense and running your own boot camp.

- **vCloud Architecture Toolkit (vCAT)**
  - Reference Architecture material for cloud design
  - Created by team of >40% VCDX
  - Learn the VCDX approach by reviewing the *Implementation Examples*
  - Sample design under the vCAT 2.0.1 release section
  - Available at [www.vmware.com/go/vcat](http://www.vmware.com/go/vcat)

- **VMware Design Classes**
Break
VCAP/VCDX Boot Camp
Part 2 of 3

The VCDX Design Scenario
Design Scenario

30:00
VCDX Design Scenario – Format

**Format**

- Design exercise role play
  - You will be given a situation/scenario that requires you to begin to architect a design
  - During the scenario, the panelists are your customers
  - The focus is on the journey to the solution, not the finished design
    - Think out-loud. Talk through the process to let the panelists see you work the problem
    - Ask questions to gather additional information for consideration
    - Go through the steps to demonstrate your strategy and thought process
    - Try to follow a thread to build your design on
    - Use diagrams
  - You are NOT expected to complete the design in the allotted time

**Duration**

- 30 minutes total
Sketch your ideas:
Walk through the topology for the design on a whiteboard.

Think:
Do I have all the information needed? What are the requirements, constraints, assumptions, and risks? Am I meeting all the business requirements?

Do:
Ask questions!
What is your strategy?
What information do you need?
What clarification?
Is risk mitigation required due to some of the business requirements?

Don’t:
Be silent as you work on the design.
The following two slides consist of a sample design scenario, just as you would receive it during the design scenario phase of your VCDX defense

- Your actual design scenario will be different
- Not all information is automatically provided
  - You must ask questions

We will walk through this scenario in a role play with the audience

- You will participate as a VCDX candidate
- We will ask you what you might think a VCDX panelist might do
- You can ask questions on any aspect of the Design Scenario
Think about the following for scenarios

- Understand the business goals and use cases. What is the problem we are trying to solve?
- Identify requirements and constraints.
- Prioritize requirements. If there are multiple goals, which one is the most important? How do they relate to or impact our goals?
- Ask questions to clarify gaps.
- Diagram proposed solutions.
- Validate and adapt proposed solutions.
Design Scenario Role Play           Scenario 1

- Client has engaged a Managed Services Organization to run Capacity Planner in their environment. The average consolidation ratio is anticipated to be 15:1.
- NetApp Fibre Channel SAN is a constraint
- Budget requires re-use of old hardware where possible.
- New hardware: 2-CPU quad-core HP BL460c, 2 on-board NIC ports, 2 NIC ports on one mezzanine card, one free mezzanine slot. The customer has procured five of the new servers.
- Select the appropriate RAID levels required for the solution.
- Explain how the process of consolidation and containment will be implemented.
- Design a cluster for a two-host failure. During deployment of each phase of this project, factor in workload balancing across resources.
- Use best practices to create a design.
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<thead>
<tr>
<th>Phase</th>
<th># Servers</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>Two way dual core CPU 4 GB RAM 2 onboard NIC ports 160 GB internal disks</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>Two way dual core CPU 4 GB RAM 2 onboard NIC ports 160 GB internal disks</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>Two way dual core CPU 4 GB RAM 2 onboard NIC ports 160 GB internal disks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I/O Characteristics</th>
<th># Servers</th>
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</thead>
<tbody>
<tr>
<td>Read/Write (balanced)</td>
<td>90</td>
</tr>
<tr>
<td>Read Intensive</td>
<td>65</td>
</tr>
<tr>
<td>Write Intensive</td>
<td>45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating System</th>
<th># Servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 2003</td>
<td>50</td>
</tr>
<tr>
<td>Windows 2008</td>
<td>50</td>
</tr>
<tr>
<td>RedHat Enterprise 5</td>
<td>50</td>
</tr>
<tr>
<td>Windows XP</td>
<td>50</td>
</tr>
</tbody>
</table>
Scenario 1 Analysis – Constraints & Requirements

**Constraints**

- NetApp Fibre Channel SAN
  - What model, what features, current configuration, expandability?
  - Was the NetApp purchased for this project?

**Requirements**

- Select appropriate RAID levels.
  - If NetApp is sufficient to support requirements, what RAID options are available? What options will support the application requirements? Do we need to consider multiple storage tiers?
- Explain implementation process for consolidation and containment of servers.
  - What are the steps for migrating the servers to virtual machines and how do we minimize the risk of server sprawl?
- Design an N+2 cluster
  - What is the minimum number of ESX Servers? Add two to provide N+2.
  - Factor in details from the Capacity Planner information.
Scenario 1 Analysis – Follow Up items

- **Details for follow up**
  - Capacity Planner output
    - Can we see details? If not, can we find out specific information from the report?
  - NetApp Fibre Channel SAN
    - What model and what device firmware is used?
    - What features are installed/licensed, and what others can be added?
    - What storage is available? What can that be increased to?
    - Can the budget support additional storage requirements?
  - What are the full details of the new hardware?
    - Was this purchased for the project?
    - What is the processor family and speed?
    - What are the NIC port speeds? For on-board? For mezzanine card?
    - Do we need additional NIC cards?
    - Do we need a SAN card?
Scenario 1 Analysis – Follow Up Items (continued)

- **Details for follow up**
  - **Budget**
    - What is the budget?
  - **Existing Servers**
    - What processor family and processor speed?
    - Can these servers be used to run ESXi or the management tools?
    - What are the NIC port speeds?
    - What type of storage is used? What is the performance characteristic? How much of the current disk is being used on each server?
    - What applications are running on each?
    - Why are there three phases? Is this due to the applications?
  - **I/O Characteristics**
    - What do the categories mean?
    - Do we have actual I/O metrics for each application?
Scenario 1 Topology

- What to include
  - Management servers
  - Resource servers
  - Networking
  - Storage
Client has a mixed environment of Intel and AMD based physical machines. There are three 1 TB LUNs of iSCSI storage. The following are requirements.

- Support virtualization of all twenty (20) existing Intel and AMD based physical machines.
- The design is for the current primary site in San Diego, CA but must support future expansion to additional sites in Singapore, Moscow, and Cairo.
- Budget requires re-use of old hardware where possible.
- Available new hardware: 2-CPU 6-core Intel servers with 2 on-board NIC ports and 32 GB of RAM.
- Existing servers that may be reused: 1 Intel and 3 AMD based servers are reusable as ESX hosts after the current workloads are migrated to virtual machines.
- Design for redundancy and flexibility for future expansion with geographically distant disaster recovery purposes.
- Explain how the process of consolidation and containment will be implemented.
<table>
<thead>
<tr>
<th>Operating System</th>
<th># Servers</th>
<th>Storage Requirements</th>
<th># Servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 2003</td>
<td>50</td>
<td>First drive 10 GB</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Second drive 20 GB</td>
<td></td>
</tr>
<tr>
<td>Windows 2008</td>
<td>50</td>
<td>Single drive of 50 GB</td>
<td>10</td>
</tr>
<tr>
<td>RedHat Enterprise 5</td>
<td>50</td>
<td>First drive 20 GB</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Second drive 20 GB</td>
<td></td>
</tr>
<tr>
<td>Windows XP</td>
<td>50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Operating system information and storage requirements
Scenario 2 Analysis – Constraints & Requirements

Constraints

• None identified

Requirements

• Solution must support virtualization of existing systems. Need to clarify mismatch of the twenty items listed on slide 1 with the 200 servers shown on slide 2.

• Must support expansion to other sites (Singapore, Moscow, and Cairo).

• Design for redundancy and flexibility for future expansion with geographically distant disaster recovery purposes.

• Explain how consolidation and containment will be implemented?
Scenario 2 Analysis – Follow Up items

Details for follow up

• Number of servers
  • Are we consolidating twenty of 200 or is there a mismatch of information between the two slides?

• Mixed processor family – existing servers
  • What is the breakdown of Intel vs. AMD servers? What are the configuration details?
  • Are there applications that use specific features of either Intel or AMD instruction sets?
  • What is the configuration of the existing servers that are reusable as ESX hosts?

• What are the full details of the new hardware?
  • Was this purchased for the project?
  • What is the process speed, NIC port speed, and expansion capabilities of each new server?
Details for follow up

- Storage Requirements
  - When showing the storage requirements on slide 2, is this the capacity used or the total disk size? What type of storage is used?
  - Why do we have only 20 servers showing in the storage table but 200 in the operating system table.
- Budget
  - What is the budget?
- I/O Characteristics of applications and servers
  - Do we have actual I/O metrics for each application and server?
Scenario 1 Analysis – Example of whiteboard notes

Requirements

• R1: Support virtualization of 200 physical machines
• R2: Support future expansion to additional sites
• R3: Re-use hardware where possible
• R4: Design for redundancy and flexibility for future expansion
• R5: Explain process of consolidation and containment

Constraints:

• n/a
Scenario 2 Topology – Examples of whiteboard diagrams

- What to include
  - Management servers
  - Resource servers
  - Networking
  - Storage
  - Multi-site connectivity and workload distribution
Break
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Part 3 of 3

The VCDX Troubleshooting Scenario
VCDX
THE HIGHEST POSSIBLE LEVEL OF VMWARE CERTIFICATION

Troubleshooting Scenario

15:00

Start  Reset
VCDX Troubleshooting Scenario – Format

Format

- Troubleshooting exercise role play
  - You will be given a problem scenario to troubleshoot
  - During the scenario, the panelists will pretend to be customers
  - The focus is on the journey to the solution, not the solution itself
    - Providing just an answer, with no rationale, is insufficient
    - Talk through the process
    - Think out-loud
    - Ask the “customer” questions to gather additional information for consideration

- Duration
  - 15 minutes total
Sketch your ideas: What does the scenario look like?

Think:
How do I normally troubleshoot an issue? Is the issue in the design, the implementation, or something else?

Do:
Show the different avenues you will take to get to the solution.

Don’t:
I’m not sure what to do next. Am I on the right track?
The following two slides consist of a sample troubleshooting scenario, just as you would receive it during the troubleshooting phase of your VCDX defense

- Your actual troubleshooting scenario will be different
- Not all information is automatically provided
  - You must ask questions
- There may be multiple problem areas, not just one

We will walk through this scenario in a role play with the audience

- You will participate as a VCDX candidate
- We will ask you what you might think a VCDX panelist might do
- You can ask questions on any aspect of the Troubleshooting Scenario
You have been asked to troubleshoot a recently built vSphere Proof-Of-Concept environment for a customer.

Reported Issues:
- The Microsoft Windows 2008 (64-bit) virtual machines on this particular ESX Server are hanging over a period of time. Some usergroups report loss of access to key applications.
- Access to the host will sometimes be non-responsive when connecting with a PuTTY SSH client.
- Virtual machines are experiencing sporadic slowness.

Configuration Details
- 100 virtual machines running on 5 ESX hosts (2 quad-core 2 GHz CPU, 64 GB RAM)
- The virtual machine’s files are stored on a single LUN shared between hosts with a mixture of VMFS and RDM placement.
- 10 Gb backbone network; ESX hosts are redundantly connected to the production network.

Accompanying slide shows high-level diagram of the networking and storage layout.
Analyze the current design.

Provide needed changes to resolve this issues and prevent the problem from recurring.
Scenario 1 Analysis

- **Issues**
  - One ESX server has virtual machines hanging over a period of time. Virtual machines are experiencing sporadic slowness (not easily repeatable).
    - **Candidate**: Can we try moving the VMs to another ESX server and see if the issue follows?
      - **Panelist**: Yes.
  - Users report loss of access to key applications.
    - **Candidate**: All applications or only applications running in the virtual machine?
      - **Panelist**: Only applications running in the virtual machine.
    - **Candidate**: All users or only some users?
      - **Panelist**: All users.
  - Access to the host using SSH is sometimes unresponsive.
    - **Candidate**: Are there times when this is more common?
      - **Panelist**: No. It is random.
Scenario 1 Analysis

- **Diagram**
  - Candidate: I need to examine the diagram and see the connectivity between components. Is this the original configuration of the system?
    - Panelist: Yes this is the original configuration.
  - Candidate: Has this problem occurred before? Have you opened a support ticket?
    - Panelist: We have just started to notice this issue as we’ve expanded on the number of virtual machines? We have not opened a support ticket yes.
  - Candidate: Are there any warning or error messages shown?
    - Panelist: Where do I get that information? What log file?
  - Candidate: Please search the system log file for warning and error messages.
    - Panelist: I am showing LUN trespass messages.
  - Candidate: Can we try having FC switch 1 move from SPA port 2 to SPB port 2 and FC switch 2 move from SPB port 2 to SPA port 2?
    - Panelist: Yes but we’ll have to schedule downtime to test this out.
A financial organization adopted virtualization in 2005 and is currently 80% virtualized. The primary virtualization administrator has gone on vacation and the rest of the team is not familiar with the environment.

Recently, access to the vCenter Server has become intermittent and in some cases inaccessible altogether. Failed connection attempts to vCenter occur from other management tools and some clients. The last action taken by the administrator was to add the backup network as we realized the local SQL instance was not being backed up.

Identify the root cause and mitigation options. Provide the security team with appropriate justification of the issue.

The security team is requesting a full analysis of why the vCenter Server has become unresponsive.
<table>
<thead>
<tr>
<th>Host</th>
<th>IP Address</th>
<th>Netmask</th>
<th>Gateway</th>
<th>VLAN</th>
<th>vSwitch</th>
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<td>Physical</td>
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</table>
Scenario 2 Analysis

Facts

- Last change done prior to the reported problem was addition of backup network.
- Access to vCenter Server is intermittent.
- Attempts to access vCenter Server by mgmt tools & clients fails.
- Backup network was added to backup local SQL server.

Solution Areas

- Networking and storage configuration
  - Rule out resource contention
  - Rule out network or storage issues
Scenario 2 Analysis

Example questions

- Which tools are being used to access vCenter Server?
- Which versions of vSphere technologies are in use?
- Is VMware HA or other availability technologies in use?
- What does ‘SQL server installed locally’ mean?

Whiteboarding

- Draw out the virtual network with vDS port groups and configuration details provided by panelists after asking.
Scenario 2 Analysis

Methodical approach

Whiteboard known information

Formulate solution areas

Ask questions
Review

Part 1
VCDX Overview and Tips

Part 2
Design Scenario

Part 3
Troubleshooting Scenario
VCAP/VCDX Boot Camp

Next Steps and Drawing
Next Steps

Prepare your design
Prepare your application
Prepare your presentation deck

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Current Project
Develop a hybrid cloud solution for a service provider utilizing both local and remote resources. Local to minimize latency, and multiple geographically disparate datacenters to provide additional capacity and capabilities.
This includes villages in multiple countries across the Himalayan mountain range.

Requirements
R001
N+1 architecture at each location.
R002
Infrastructure must be resilient to support frequent power outages and dependencies on alternative forms of energy such as solar, wind, and hydroelectric.
R003
Provide details on cloud bursting methodology and process

Risks
RI-001
Power reliability.
RI-002
Land/snow slides and earthquakes impacting network connectivity across sites.

Constraints
C001
Bandwidth cannot be expanded beyond what is currently available.
C002
Applications have distance requirements based on latency between client and server.
Please enter your name and contact details
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Thank you for attending!

John Arrasjid
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Strategic Architect APJ, VCDX-066

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