

Obj	Description	Sub-topics
1	Architectures and Technologies	
1.1	Identify the pre-requisites and components for a vSphere implementation	vSphere components vCenter / PSC deployment options <ul style="list-style-type: none"> <li>- Windows VC / VCSA</li> <li>- Embedded / External PSC</li> <li>- Enhanced / Enhanced Linked Mode</li> </ul> Compute requirements Storage requirements Network requirements <ul style="list-style-type: none"> <li>- Networks / subnets</li> <li>- ports</li> </ul> Other requirements <ul style="list-style-type: none"> <li>- AD</li> <li>- DNS</li> </ul>
1.2	Identify vCenter high availability requirements	vCenter High Availability Overview VMware Product version requirements (VC, ESXi) Compute / storage requirements Storage requirements Network requirements <ul style="list-style-type: none"> <li>- Networks / subnets</li> <li>- Ports</li> <li>- Latency</li> </ul> License Other requirements
1.3	Describe storage types for vSphere (iSCSI, NFS, vSAN etc)	Traditional Storage Virtualization Models <ul style="list-style-type: none"> <li>- Storage device or LUN</li> <li>- Virtual Disk</li> <li>- Local Storage</li> <li>- Storage Area Networks (SAN)</li> </ul>

		<ul style="list-style-type: none"> <li>- FC</li> <li>- iSCSI</li> <li>- FCoE</li> <li>- NAS / NFS</li> <li>- VMFS</li> <li>- Raw Device Mappings (RDMs)</li> </ul> <p>Software Defined Storage Models</p> <ul style="list-style-type: none"> <li>- VSAN</li> <li>- vVOLS</li> <li>- Storage Policy Based Management</li> <li>- I/O Filters</li> </ul>
1.4	Differentiate between NIOC and SIOC	<ul style="list-style-type: none"> <li>- NIOC</li> <li>- SIOC</li> </ul>
1.5	Manage vCenter inventory efficiently	<ul style="list-style-type: none"> <li>- Provide ability to perform vSphere operations via vROps</li> <li>- Provide ability to manage logs via vRLI</li> <li>- Implement vCenter tags</li> <li>- Implement SPBM</li> <li>- RBAC (groups / permissions)</li> </ul>
1.6	Describe and differentiate vSphere HA, DRS, and SDRS functionality (Proactive HA, Predictive DRS)	<ul style="list-style-type: none"> <li>- HA</li> <li>- DRS</li> <li>- SDRS functionality</li> <li>- Proactive HA</li> <li>- Predictive DRS</li> </ul>
1.7	Describe resource pools and use cases	<ul style="list-style-type: none"> <li>- Resource Pool Overview</li> <li>- How are resources applied by vSphere on resource pools and related objects? <ul style="list-style-type: none"> <li>o Shares</li> <li>o Reservations</li> <li>o Limits</li> </ul> </li> <li>- Use cases and examples</li> </ul>
1.8	Differentiate between vDS and vSS	<ul style="list-style-type: none"> <li>- Virtual switch concepts</li> <li>- Standard virtual switch (vDS)</li> <li>- Distributed virtual switch (vSS)</li> <li>- Comparison of vDS / vSS</li> </ul>

1.9	Describe the purpose of cluster and the features it provides.	vSphere cluster overview <ul style="list-style-type: none"> <li>- DRS cluster</li> <li>- HA cluster</li> <li>- VSAN cluster</li> </ul>
1.10	Describe virtual machine file structure	<ul style="list-style-type: none"> <li>- VM file structure overview</li> <li>- VM / folder / file naming</li> <li>- Configuration file</li> <li>- Virtual disk files</li> <li>- Snapshot files</li> <li>- Other files</li> </ul>
1.11	Describe vMotion and Storage vMotion technology	<ul style="list-style-type: none"> <li>- VM migration overview <ul style="list-style-type: none"> <li>o Cold migrations</li> <li>o Hot migrations</li> <li>o Cross host migrations</li> <li>o Cross datastore migrations</li> <li>o Cross vCenter Server migrations</li> </ul> </li> <li>- vMotion overview</li> <li>- vMotion prerequisites</li> <li>- vMotion data flow details</li> <li>- Storage vMotion overview</li> <li>- Storage vMotion prerequisites</li> <li>- Storage vMotion data flow details</li> </ul>
2	VMware Products and Solutions	
2.1	Describe integration with other VMware products	<ul style="list-style-type: none"> <li>o Integration overview</li> <li>o Horizon View</li> <li>o vSphere Replication</li> <li>o SRM</li> <li>o vRA</li> <li>o vROps</li> </ul>
2.2	Describe the high availability solutions for vSphere	<ul style="list-style-type: none"> <li>o Overview</li> <li>o HA</li> <li>o FT</li> <li>o VC HA</li>   <li>o vCenter Availability</li> <li>o MSCS for VC availability</li> </ul>
2.3	Describe the options for securing a	<ul style="list-style-type: none"> <li>o ESXi:</li> <li>o vCenter:</li> </ul>

	vSphere environment	<ul style="list-style-type: none"> <li>○ VMs: <ul style="list-style-type: none"> <li>○ VM Encryption</li> </ul> </li> <li>○ Virtual Networking:</li> </ul>
4	Installing, Configuring, and Setup	
4.1	Understand basic log output from vSphere Products	<ul style="list-style-type: none"> <li>○ Export System Log Files</li> <li>○ Location of log files</li> <li>○ ESXi 6.5 log file locations</li> <li>○ vCenter Server log file locations</li> <li>○ Syslog configuraiton</li> <li>○ vRLI configuration</li> </ul>
4.2	Create and configure vSphere objects	<p>How to create</p> <ul style="list-style-type: none"> <li>● Folders (network, VM, storage)</li> <li>● Resource pools</li> <li>● Clusters</li> </ul> <p>How to configure objects</p>
4.3	Set up content library	<ul style="list-style-type: none"> <li>○ Create a content library. Pp58</li> <li>○ Publish a content library</li> <li>○ Subscribe to a content library. Pp59</li> <li>○ Content Library Administrator Role and global permssions</li> <li>○ Sync options (automatic vs on-demand)</li> <li>○ Add Items to the Content Library.</li> <li>○ Deploy VMs using the Content Library</li> </ul>
4.4	Set up ESXi hosts	<ul style="list-style-type: none"> <li>○ Install ESXi</li> <li>○ Add to vCenter Server</li> <li>○ Apply host profiles</li> </ul>
4.5	Configure virtual networking	<p>How to:</p> <ul style="list-style-type: none"> <li>○ Create and configure vSS</li> <li>○ Create and configure standard virtual switch port groups</li> <li>○ Create and configure vDS</li> </ul>

		<ul style="list-style-type: none"> <li>○ Create and configure distributed virtual switch port groups</li> <li>○ Create and configure NSX logical switches</li> </ul>
4.6	Deploy and configure VCSA	Download VCSA Deploy VCSA <ul style="list-style-type: none"> <li>- Single VCSA</li> <li>- Multiple VCSA</li> </ul> Configure VCSA
4.7	Set up identity sources	<ul style="list-style-type: none"> <li>- SSO Overview</li> <li>- Identity source overview</li> <li>- How to setup an AD Identity Source</li> <li>- How to setup other Identity Sources</li> </ul>
4.8	Configure an SSO Domain	<ul style="list-style-type: none"> <li>- Add an SSO Identity source</li> <li>- Edit an SSO identity source</li> <li>- When is vSphere Web Client required?</li> <li>- VUM config changes</li> <li>- VMware Tools and VM hardware updates</li> <li>- Viewing events and notifications</li> <li>- Viewing and manipulating Quick Book capability</li> </ul>
5	Performance-tuning and Optimization	
5.1	Determine effective use cases for snapshots	<ul style="list-style-type: none"> <li>- Snapshot overview</li> <li>- Use Cases</li> <li>- What a snapshot preserves</li> <li>- Operations</li> </ul>
5.2	Monitor resources of VCSA and vSphere environment	VCSA monitoring (VAMI): <ul style="list-style-type: none"> <li>- Monitor VC services</li> <li>- Configure access, networking, time, services, update, admin, syslog, backup</li> </ul> Overview graphs <ul style="list-style-type: none"> <li>● Data center</li> <li>● Cluster</li> <li>● Resource pool</li> <li>● ESXi host</li> <li>● VM</li> </ul>

		<p>Advanced graphs</p> <ul style="list-style-type: none"> <li>• ESXi host</li> <li>• VM</li> </ul>
5.3	Identify impacts of VM configurations	<ul style="list-style-type: none"> <li>- Compute oversize / undersize</li> <li>- Virtual disk oversize / undersize</li> <li>- VMDK provisioning types</li> <li>- Resource reservations</li> <li>- Independent disks</li> <li>- Guest OS type</li> <li>- VMware Tools version</li> <li>- permissions</li> </ul>
7	Administrative and Operational Tasks	
7.1	Manage virtual networking (VDS, VSS)	<ul style="list-style-type: none"> <li>• vSS <ul style="list-style-type: none"> <li>○ add port group</li> <li>○ trunk additional VLAN</li> <li>○ migrating VMs between hosts</li> <li>○ steps required per host, per vSS to support a change on a physical switch</li> </ul> </li> <li>• vDS <ul style="list-style-type: none"> <li>○ add distributed port group</li> <li>○ trunk additional VLAN</li> <li>○ migrating VMs on hosts connected to vDS</li> <li>○ adding a host to a vDS</li> <li>○ steps required per vDS to support a change on a physical switch</li> </ul> </li> <li>• Migrating VMs between vSS and vDS</li> </ul>
7.2	Manage datastores (sizing, LUN management, iSCSI, vSAN, port binding)	<ul style="list-style-type: none"> <li>- Create a VMFS datastore.</li> <li>- Increase VMFS datastore capacity</li> <li>- Sizing</li> <li>- Storage Space Reclamation pp 336</li> <li>- LUN management</li> <li>- iSCSI management</li> <li>- vSAN management</li> <li>- port binding</li> </ul>
7.3	Configure a storage policy	<ul style="list-style-type: none"> <li>- SPBM</li> <li>- VM storage policies</li> <li>- About rules and rule sets.</li> <li>- Creating and managing VM storage policies</li> <li>- Storage policy components</li> </ul>

		<ul style="list-style-type: none"> <li>- Default storage policies</li> </ul>
	Configure host security	<ul style="list-style-type: none"> <li>- General ESXi Security Requirements</li> <li>- Built-in Security Features</li> <li>- Additional Security Measures:</li> <li>- Configure ESXi Hosts with Host Profiles:</li> <li>- Use Scripts to Manage Host Configuration Settings</li> <li>- ESXi Passwords and Account Lockout</li> <li>- SSH Security</li> <li>- ESXi Networking Security Recommendations</li> <li>- Certificate Management for ESXi Hosts</li> <li>- Customizing Hosts with the Security Profile <ul style="list-style-type: none"> <li>o ESXi Firewall Configuration</li> <li>o Customizing ESXi Services from the Security Profile</li> <li>o Enable or Disable a Service in the Security Profile</li> <li>o Lockdown Mode</li> <li>o Manage the Acceptance Levels of Hosts and VIBs</li> </ul> </li> <li>- Other: <ul style="list-style-type: none"> <li>o Assigning Privileges for ESXi Hosts</li> <li>o Using Active Directory to Manage ESXi Users</li> <li>o Using vSphere Authentication Proxy</li> <li>o Configuring Smart Card Authentication for ESXi</li> <li>o UEFI Secure Boot for ESXi Hosts</li> <li>o Securing ESXi Hosts with Trusted Platform Module</li> <li>o ESXi Log Files</li> </ul> </li> </ul>
7.5	Configure role-based user management	<ul style="list-style-type: none"> <li>- Role based permission overview <ul style="list-style-type: none"> <li>o Users / groups</li> <li>o Roles</li> <li>o objects</li> <li>o Permission</li> </ul> </li> <li>- How to set a permission on an object</li> <li>- How permissions are applied from parent objects</li> </ul>
7.6	Configure and use vSphere compute and storage cluster options	<ul style="list-style-type: none"> <li>- DRS cluster configuration / administration</li> <li>- HA cluster configuration / administration</li> <li>- VSAN cluster configuration / administration</li> </ul>

		DRS cluster configuration / administration
7.7	Perform different types of migrations (Cross vCenter, Storage vMotion, vMotion etc)	<ul style="list-style-type: none"> <li>- CPU compatibility, compatibility checks, and EVC</li> <li>- vMotion.</li> <li>- Storage vMotion</li> <li>- Migrated powered off or suspended VM i</li> <li>- Migrate VM to new compute resource.</li> <li>- Migrate VM to new storage.</li> <li>- Limits on simultaneous migrations</li> <li>- Cross vCenter</li> </ul>
7.8	Manage resources of a vSphere environment (VCSA and ESXi)	<ul style="list-style-type: none"> <li>- Resource allocation and resource management concepts</li> <li>- Virtual machine attributes and admission control</li> <li>- Resource pools management</li> <li>- SDRS / SIOC Management</li> <li>- Advanced resource management options</li> <li>- Performance considerations</li> </ul>
7.9	Create and manage VMs using different methods	<ul style="list-style-type: none"> <li>o New VM <ul style="list-style-type: none"> <li>o Prereqs</li> <li>o procedure</li> </ul> </li> <li>- Deploy VM from a template <ul style="list-style-type: none"> <li>o Prereqs</li> <li>o procedure</li> </ul> </li> <li>- Deploy VM from a template in the vSphere Web Client</li> <li>o Clone an existing VM. <ul style="list-style-type: none"> <li>o Prereqs</li> <li>o procedure</li> </ul> </li> <li>- Clone an existing VM in the vSphere Web Client.</li> <li>- Clone a VM with Instant Clone</li> <li>- Convert a template to a VM.</li> <li>- Deploy OVF and OVA templates</li> <li>- vRO VM deployment workflow</li> </ul>
7.10	Create and manage templates	<ul style="list-style-type: none"> <li>o Clone VM to a template</li> <li>o Clone a VM to a template in the vSphere Web Client</li> <li>o Clone a template to a template</li> <li>o Clone a template to a template using the vSphere Web client</li> </ul>
7.11	Configure and manage different vCenter objects (e.g.	<ul style="list-style-type: none"> <li>o Overview / planning</li> <li>o Inventory pane and layout</li> <li>o Create data centers.</li> </ul>



	Datacenter, Folder etc.)	<ul style="list-style-type: none"> <li>○ Add a host.</li> <li>○ Create a folder.</li> <li>○ Create clusters.</li> <li>○ Configure a cluster.</li> <li>○ Extend a cluster</li> </ul>
7.12	Set up permissions on datastores, clusters, vCenter and hosts	<ul style="list-style-type: none"> <li>● Authorization</li> <li>● Managing permissions</li> <li>● Permissions</li> <li>● Inventory Hierarchy</li> <li>● Application of permissions in the hierarch</li> <li>● Users and Groups</li> <li>● Privileges</li> <li>● Global permissions.</li> <li>● Roles</li> <li>● Best practices for roles and permissions</li> <li>● Required privileges for common tasks</li> </ul>
7.13	Identify and interpret Affinity/Anit-Affinity rules	<ul style="list-style-type: none"> <li>● VM-Host affinity rule</li> <li>● VM-VM affinity rule</li> <li>● Anti-affinity rule</li> <li>● Create Rules</li> <li>● VM-VM Affinity Rule Conflicts</li> </ul>
7.14	Understand use cases for alarms	<ul style="list-style-type: none"> <li>- Alarm overview</li> <li>- Alarms name, targets, rules</li> <li>- Alarm type</li> <li>- Alarm triggers: event, condition, state</li> <li>- Tolerance thresholds</li> <li>- Actions: send Email (SMTP), SNMP trap, run script / command</li> <li>- Alarm severity level: normal (green), warning (yellow), alert (red)</li> <li>- Use cases</li> </ul>
7.15	Utilize VUM (create baselines, appying baselines, notifications, download, remediate)	<ul style="list-style-type: none"> <li>○ VUM Overview <ul style="list-style-type: none"> <li>○ VUM procedures</li> <li>○ create baselines</li> <li>○ apply baselines</li> <li>○ notifications</li> <li>○ download</li> <li>○ remediate</li> </ul> </li> </ul>

