IBM Spectrum Storage Professional Certification Program

Study Guide Series

Exam C9060-300 - IBM Spectrum Control V5.2.8 Implementation

Purpose of Exam Objectives

When an exam is being developed, the Subject Matter Experts work together to define the role the certified individual will fill. They define all of the tasks and knowledge that an individual would need to have in order to successfully implement the product. This creates the foundation for the objectives and measurement criteria, which are the basis for the certification exam.

The Spectrum Storage Certification item writers use these objectives to develop the questions that they write and which will appear on the exam.

It is recommended that you review these objectives. Do you know how to complete the task in the objective? Do you know why that task needs to be done? Do you know what will happen if you do it incorrectly? If you are not familiar with a task, then go through the objective and perform that task in your own environment. Read more information on the task. If there is an objective on a task there is about a 95% chance that you WILL see a question about it on the actual exam.

After you have reviewed the objectives and completed your own research, then take the assessment exam. While the assessment exam will not tell you which question you answered incorrectly, it will tell you how you did by section. This will give you a good indication as to whether you are ready to take the actual exam or if you need to further review the materials.

Note: This is the high-level list of objectives. As you review these objectives, click for a more detailed level of how to perform the task.

High-level Exam Objectives

Section 1 - Planning for Installation and Configuration	
1.1	Given a defined customer environment and required objectives, ensure interoperability and account for any special requirements prior to installation so that the system is ready for the IBM Spectrum Control installation.
1.2	Given the customer's IBM Spectrum Control installation, determine security needs for IBM Spectrum Control UI and Storage Resource Agent deployment so that IBM Spectrum Control server can be used and deployed.
1.3	Given the need for daily reporting, capacity planning, and monitoring, determines the reporting needs and building of alerting for an automated process to be implemented so that documented storage needs with reporting and alerting for early detection can be achieved.
1.4	Given a customer’s IBM Spectrum Control environment, determine if a new installation or a migration/upgrade to the newest IBM Spectrum Control code, or the server agent, or both are required to be completed so that requirements are understood.
1.5	Given a customer environment where the latest release of IBM Spectrum Control will be installed, ensure that all installation requirements are met so that IBM Spectrum Control is ready for installation.
Section 2 - Installation	
2.1	Given a requirement for an IBM Spectrum Control installation, ensure the supplied version of software and licenses are valid and accessible so that a fully functional Spectrum Control environment can be achieved.
2.2	Given Spectrum Control media, perform installation steps by using an installer method so that the Spectrum Control server is successfully installed and operational.
2.3	Given installation errors, determine the root cause of the failure so that they can be corrected for successful installation.
Section 3 - Configuration	
3.1	Given a customer requirement to manage devices in the same manner, configure devices (servers, switches, storage), so that data collection is performed.
3.2	Given a probe defined to collect status and asset information about a selected resource define and create schedules so that a message is displayed that confirms that a probe schedule was created for the resource(s).

3.3	Given a functioning IBM Spectrum Control environment and configured fabric and storage subsystems, configure History settings and automation so that all jobs have been scheduled, completed or running that can be seen and managed.
3.4	Given a customer requirement for alerts, identify the alerts which are required to be defined and set triggering conditions and actions so that customer will get the appropriate alerts based on requirements.
3.5	Given a functioning IBM Spectrum Control environment and configured fabric switches, and storage subsystems, use IBM Spectrum Control to define performance monitoring jobs to collect performance data so that running and completed jobs can be viewed.
3.6	Given a successful IBM Spectrum Control server installation, configure the agentless server so that it can be used to provision storage to a host that has no Storage Resource Agent deployed or to provide end to end correlation between server and storage based on WWPN.
Section 4 - Customization and Administration	
4.1	Given a working IBM Spectrum Control environment, use the WEB UI Dashboard to view the summary information about a storage environment, monitor the overall condition and usage of resources, and the number of acknowledged/unacknowledged alert conditions that are detected on monitored resources. The condition of applications, groups and other entities that consume storage on resources as well as a display chart showing the most active storage systems are also available.
4.2	Given a working IBM Spectrum Control environment where all supported platform requirements have been met, interact with a Storage Resource Agent (SRA) so that the agent is available for interaction.
4.3	Given customer requirements and a working IBM Spectrum Control installation, perform daily and periodic maintenance so that the Spectrum Control is running at optimum.
4.4	Given a set of IBM Spectrum Control users, define which parts of IBM Spectrum Control each user or user group can access so that it meets the user's security requirements.
4.5	Given a working IBM Spectrum Control environment and customer requirements, configure resources history retention so that a customer can keep data based on set number of days.
4.6	Given Cognos is installed and a customer requirement for capacity and performance reporting for all resources managed and monitored by the Spectrum Control server, create, schedule, and run reports by using the WEB UI so that reports can be generated using Cognos.

4.7	Given a requirement to monitor and view performance for specific storage systems, switches and their internal resources using IBM Spectrum Control view the performance of specific storage systems, switches and their internal resources so that performance metrics are displayed.
4.8	Given Storage Resource with Pools has been configured to IBM Spectrum Control and probe has been running successfully for more than 1 month, monitor and view historical capacity data for pools of a specific storage systems, using IBM Spectrum Control so that a projection can be made as to when a pool will run out of space.
4.9	Given the storage subsystems are configured and probe is running successfully and the license/terabyte is known, verify managed capacity and check licensing so that it can be determined that the total capacity of the storage systems that are being managed does not exceed the licensed capacity limit.
4.10	Given a working IBM Spectrum Control environment and customer requirements, interact with groups so that groups can be monitored to assist with hierarchical insights around capacity and performance.
4.11	Given a well defined storage environment, assign Tiers to Storage Pools so that storage pools can use the VSC enhanced functions.
4.12	Given an installed IBM Spectrum Control server and DB2 database, administer the database so that the server and database are fully functioning.
4.13	Given a functioning IBM Spectrum Control server and properly configured devices interact with storage, servers and network entities including Access Gateway /NPV Switches and navigate the WEB UI so that properties and details can be viewed to gather information based on customer requirements.
Section 5 - Troubleshooting	
5.1	Given a functioning IBM Spectrum Control, check for successful probes and performance monitor jobs, review reports, output reports/ logs, and displays so that analysis of functionality can be accomplished.
5.2	Given an IBM Spectrum Control installation at a customer site, determine the status of the components, stopping and starting the components so that it can be determined that IBM Spectrum Control is working properly.
5.3	Given an installed IBM Spectrum Control server and Internet access, gather data from service tool, repocopy tool, logs and output reports so that application data logs and tools output can be assembled and sent to IBM Support via the PMR process.
5.4	Given errors in running data collection jobs or to the entity itself, configure error monitoring so that the IBM Spectrum Control administrator can be alerted.

5.5	Given a failure of scheduling jobs or tasks and configured alerting, determine the root cause of the failure so that it can be corrected.
5.6	Given a successful IBM Spectrum Control server installation, check various locations for successful completion of daily tasks, performance metrics and alerts so that the system is running efficiently.
5.7	Given a customer's Spectrum Control environment has encountered errors, define necessary steps to configure tracing to aid in problem determination as directed by the IBM support team so that message logging is enabled and enhanced.
5.8	Given a Spectrum Control installation with error conditions and Internet access, use the menus to generate relevant log files online so that gathered information can be used for troubleshooting.
Section 6 - Advanced Analytics	
6.1	Given a functioning IBM Spectrum Control server with advanced licensing, a requirement to analyze storage tiers using IBM Spectrum Control and volumes/pools residing on the same SVC, optimize the placement of volumes on storage tiers and analyze the tiering of volumes so that recommendations are generated and displayed to ensure that the volumes are placed on tiers that best match the workload requirements of the volumes.
6.2	Given a functioning IBM Spectrum Control with Advanced Edition license and properly configured storage devices with volumes/pools residing on the same SVC, balance pools so that storage performance is optimized.
6.3	Given a successful IBM Spectrum Control server installation, work with Capacity Pools so that Capacity Pools can be used to separate storage resources in a way that serves the needs of the environment or business.
6.4	Given an installed IBM Spectrum Control server with advanced licensing and a known Storage environment classification, define Service Classes and assign Tiers or a range of Tiers to it so that server classes are created.
6.5	Given a working IBM Spectrum Control environment with advanced licensing and customer requirements with volumes residing on an SVC, perform storage optimization by transforming volumes in storage virtualizer pools so that recommendations from analysis and implement volume provisioning state changes within a storage virtualizer can be reviewed.
6.6	Given a successful IBM Spectrum Control server installation with advanced licensing, provision storage to a server/cluster using Provisioning in the Advanced Analytics section so that additional storage will be provided to a Server/Hypervisor.

Detailed Exam Objectives

Section 1 - Planning for Installation and Configuration

1.1. Given a defined customer environment and required objectives, ensure interoperability and account for any special requirements prior to installation so that the system is ready for the IBM Spectrum Control installation.

SUBTASK(S):

1.1.1. Gather IBM Spectrum Control Server and host server information to validate appropriate versions of software and hardware requirements are met etc..

1.1.2. Gather storage area network (SAN) device information to ensure hardware and version/firmware levels are supported and to prepare for any special requirements such as network attached storage devices and Hypervisors

1.1.3. Gather non-IBM storage devices information to plan for SMIs Agent installations

1.1.4. Network topology:

- 1.1.4.1. Gather relevant and IP addresses and fully qualified host server names to be used in configuration.
- 1.1.4.2. Gather IP addresses and fully qualified host names of managed servers, fabric and storage, etc.
- 1.1.4.3. Gather subnet and gateway information.
- 1.1.4.4. Gather LAN layout information.
- 1.1.4.5. Gather WAN information if applicable.

1.1.5. Licensing and Optional Components

- 1.1.5.1. Gather detailed information of what was purchased (identify software media, licensing, etc.).
- 1.1.5.2. Validate customer requirements can be fulfilled by purchased software.
- 1.1.5.3. Validate capacity of managed resources is covered by license purchased.
- 1.1.5.4. Determine if Jazz for Service Management and Tivoli Common Reporting are required to be installed as optional components.

1.1.6. Existing Network Security, etc.:

- 1.1.6.1. Gather details of any firewalls in place.
- 1.1.6.2. Determine ports to be used for the installation.
- 1.1.6.3. Determine if IP connectivity is open and intact between the IBM Spectrum Control server and all relevant devices in the environment.
- 1.1.6.4. Identify and Disable running anti-virus software.

1.2. Given the customer's IBM Spectrum Control installation, determine security needs for IBM Spectrum Control UI and Storage Resource Agent deployment so that IBM Spectrum Control server can be used and deployed.

SUBTASK(S):

1.2.1. Determine the proposed IBM Spectrum Control authentication type required and how it will impact installations (i.e.) OS Authentication vs. LDAP Authentication.

1.2.2. Determine user(s) requirements and their respective functions/role assigned in IBM Spectrum Control WEB UI and where to configure in WEB UI.

1.2.3. Determine SNMP details to be used when connecting to Fabric Switches or Directors and how to configure in WEB UI.
1.2.4. Identify operating system user ID, PORT number requirements, etc. to be used in considerations of Storage Resource Agent (SRA) deployments.
1.2.5. Determine SMI's credentials to be used when connecting to non-IBM Storage or to Brocade Network Advisor.

1.3. Given the need for daily reporting, capacity planning, and monitoring, determines the reporting needs and building of alerting for an automated process to be implemented so that documented storage needs with reporting and alerting for early detection can be achieved.

SUBTASK(S):
1.3.1. Determine subsystem reporting requirements and locate specific reports in WEB UI.
1.3.2. Validate customer storage systems against the IBM Spectrum Control product support matrix to determine compatibility.
1.3.3. Identify how IBM Spectrum Control can analyze customer storage tiering requirements.
1.3.4. Evaluate IBM Spectrum Control scalability requirements based on the customer's environment.
1.3.5. Determine and apply Probe and Performance Monitor run iteration frequencies and schedules.
1.3.6. Determine necessary alerts to be configured and where to apply in WEB UI.
1.3.7. View Subsystem Performance in WEB UI.
1.3.8. Determine Reporting requirements for customized Cognos Reports.

1.4. Given a customer's IBM Spectrum Control environment, determine if a new installation or a migration/upgrade to the newest IBM Spectrum Control code, or the server agent, or both are required to be completed so that requirements are understood.

SUBTASK(S):
1.4.1. Verify supported OS for IBM Spectrum Control.
1.4.2. Verify software/hardware resources are supported by IBM Spectrum Control.
1.4.3. Verify DB2 version is supported for IBM Spectrum Control.
1.4.4. Verify current state of IBM Spectrum Control Server.
1.4.5. Verify requirements for server, SRAs, storage subsystems, CIMOMs (SMI-S Agents) and Fabrics.
1.4.6. Review Investigation and Planning, Strategy and Best Practices.

1.5. Given a customer environment where the latest release of IBM Spectrum Control will be installed, ensure that all installation requirements are met so that IBM Spectrum Control is ready for installation.

SUBTASK(S):

1.5.1. Verify customer has downloaded correct license.
1.5.2. Check hardware and software prerequisites.
1.5.3. Check OS prerequisites.
1.5.4. Check DB2 prerequisites.
1.5.5. Verify all storage subsystems hardware firmware levels.
1.5.6. Verify all SAN fabric and switches hardware firmware/version levels.
1.5.7. Obtain version level information for any deployed SMI-S agents.
1.5.8. Verify sizing limitations.
1.5.9. Check to see if external user id is valid and passwords are available and tested prior to installation.

Section 2 - Installation

2.1. Given a requirement for an IBM Spectrum Control installation, ensure the supplied version of software and licenses are valid and accessible so that a fully functional Spectrum Control environment can be achieved.

SUBTASK(S):
2.1.1. Verify customer requirements can be met with the Spectrum Control media downloaded.
2.1.2. Identify and procure the media to install.
2.1.3. Use MD5 checksum to verify integrity of downloads.

2.2. Given Spectrum Control media, perform installation steps by using an installer method so that the Spectrum Control server is successfully installed and operational.

SUBTASK(S):
2.2.1. Review the README file from the installation media.
2.2.2. Check for latest technical resource flashes on the Spectrum Control support Website.
2.2.3. Perform installation steps by using the appropriate operating system installer.
2.2.3.1. Launchpad
2.2.3.2. Silent
2.2.4. Log in to Spectrum Control WEB UI to verify installation.

2.3. Given installation errors, determine the root cause of the failure so that they can be corrected for successful installation.

SUBTASK(S):
2.3.1. Determine at what point the installation error occurred.
2.3.2. Go to Spectrum Control installation location under the log directory for the specific OS to review the logs to determine where the failure occurred.
2.3.3. Resolve the issue based on the error log explanation.
2.3.4. Reinstall Spectrum Control or the required or missing component.
2.3.5. If the issue cannot be resolved, contact IBM Spectrum Control support.

Section 3 - Configuration

3.1. Given a customer requirement to manage devices in the same manner, configure devices (servers, switches, storage), so that data collection is performed.

SUBTASK(S):
3.1.1. Select the device type to be added/configured.
3.1.2. Configure the data collection method scheduling a probe task.
3.1.3. Verify the status of the scheduled jobs having been successfully performed.
3.1.4. Right-click to View Properties or View Details.

3.2. Given a probe defined to collect status and asset information about a selected resource define and create schedules so that a message is displayed that confirms that a probe schedule was created for the resource(s).

SUBTASK(S):
3.2.1. From the menu bar in the WEB UI, go to the resource list page for a resource type
3.2.2. Locate the resources to probe
3.2.3. Select the resource rows and click Actions -> Data Collection -> Schedule
3.2.4. On the Data Collection Schedule window, set the probe to Enable
3.2.5. Enter the time to schedule the data collection, select the frequency and click SAVE.

3.3. Given a functioning IBM Spectrum Control environment and configured fabric and storage subsystems, configure History settings and automation so that all jobs have been scheduled, completed or running that can be seen and managed.

SUBTASK(S):
3.3.1. Configure History Retention Settings in the WEB UI.
3.3.2. Create scheduled SRA deployment jobs in the WEB UI.
3.3.3. Create scheduled SRA upgrade jobs in the WEB UI.

3.4. Given a customer requirement for alerts, identify the alerts which are required to be defined and set triggering conditions and actions so that customer will get the appropriate alerts based on requirements.

SUBTASK(S):
3.4.1. Configure IBM Spectrum Control environment to send SNMP Traps
3.4.2. Configure IBM Spectrum Control environment to send Email alerts
3.4.3. Configure IBM Spectrum Control environment to send Netcool/OMNIbus
3.4.4. Configure Email server for sending alert notifications
3.4.5. Configure Global email notification settings

3.4.6. Determine alert types which have to be created (i.e., storage, servers, network) in the WEB UI.
3.4.7. Select a specific entity on which alerting is applicable
3.4.8. Edit the alert condition.
3.4.9. Configure alerting suppression for a given resource.
3.4.10. Select the triggering actions to be taken

3.5. Given a functioning IBM Spectrum Control environment and configured fabric switches, and storage subsystems, use IBM Spectrum Control to define performance monitoring jobs to collect performance data so that running and completed jobs can be viewed.

SUBTASK(S):
3.5.1. Determine which device will be monitored.
3.5.1.1. enable Performance Monitoring Tool (CiMon) to get data for IBM Spectrum Scale
3.5.2. Schedule data collection of performance monitor.
3.5.3. Select the frequency for the schedule to be run.

3.6. Given a successful IBM Spectrum Control server installation, configure the agentless server so that it can be used to provision storage to a host that has no Storage Resource Agent deployed or to provide end to end correlation between server and storage based on WWPN.

SUBTASK(S):
3.6.1. In WEB UI expand Servers, click Servers, click add Servers
3.6.2. Click Add server, do not mark “Deploy an agent for full server monitoring”,
3.6.3. Select a method to deploy a server:
3.6.3.1. Manually deploy a server
Enter IP address or Hostname (mandatory)
Enter Server OS (optional)
Enter Location (optional)
mark Add ports (optional, but mandatory for WWPN correlation)
Click Next
Enter the appropriate WWPN, if applicable click “add” to enter Additional WWPN
Click Finish
3.6.3.2. From a File List
Click Browse button and select the appropriate file list
Click Finish
3.6.3.3. From discovered Server (discovered, but not monitored)
Select Server(s) to add
Enter WWPN(s) (optional)
Click Finish

Section 4 - Customization and Administration

4.1. Given a working IBM Spectrum Control environment, use the WEB UI Dashboard to view the summary information about a storage environment, monitor the overall condition and usage of resources, and the number of acknowledged/unacknowledged alert conditions that are detected on monitored resources. The condition of applications, groups and other entities that consume storage on resources as well as a display chart showing the most active storage systems are also available.

SUBTASK(S):

4.1.1. Log in to IBM Spectrum Control WEB UI.
4.1.2. Go to Home > Dashboard in the Menu Bar
4.1.3. Select and click resource icons in the dashboard to view detailed information that IBM Spectrum Control is currently monitoring.
4.1.4. The mouse pointer can be positioned or hovered over lines in the Most Active Storage Systems chart to view performance information about specific resources
4.1.5. Additional resources can be added for monitoring by selecting and clicking a resource icon

4.2. Given a working IBM Spectrum Control environment where all supported platform requirements have been met, interact with a Storage Resource Agent (SRA) so that the agent is available for interaction.

SUBTASK(S):

4.2.1. Validate user credentials.
4.2.2. Validate network connectivity.
4.2.3. Ensure consistent security certificates.
4.2.4. Under the Server menu in the WEB UI, add a server.
4.2.5. Deploy an agent (WEB UI or remotely)
4.2.6. Interact with the agent:
    4.2.6.1. Upgrade the agent.
    4.2.6.2. Provision storage.
    4.2.6.3. Add to an application grouping.
    4.2.6.4. Review agent probe logs.
    4.2.6.5. Analyze Tiering.
4.2.7. Troubleshoot the SRA.
4.2.8. Generate and collect SRA logs with the SRA Service Tool.

4.3. Given customer requirements and a working IBM Spectrum Control installation, perform daily and periodic maintenance so that the Spectrum Control is running at optimum.

SUBTASK(S):

4.3.1. Check for fixes and upgrades.
4.3.2. Check logs for any error conditions on the server.
4.3.3. Add/delete or alter user’s information.

4.3.4. Run any daily reports.
4.3.5. Check the health of data sources.
4.3.6. Check for performance monitors.
4.3.7. Determine if it is necessary to run the DB2 maintenance tool regularly

4.4. Given a set of IBM Spectrum Control users, define which parts of IBM Spectrum Control each user or user group can access so that it meets the user's security requirements.

SUBTASK(S):
4.4.1. IBM Spectrum Control allows for multiple groups for each role. Create an LDAP or local user group for the roles within IBM Spectrum Control desired.
4.4.2. When logged in to the Control WEB UI as a user with IBM Spectrum Control administrative user privileges, by using the menu bar Settings -> User Management, assign the newly created or existing OS/LDAP user groups to selected Control roles and click on the Save button.
4.4.3. Log in to the IBM Spectrum Control WEB UI with a user that belongs to a group that has been assigned to one of the IBM Spectrum Control roles.

4.5. Given a working IBM Spectrum Control environment and customer requirements, configure resources history retention so that a customer can keep data based on set number of days.

SUBTASK(S):
4.5.1. Log in to IBM Spectrum Control WEB UI.
4.5.2. Go to Settings menu and select History Retention.
4.5.3. Select Edit.
    4.5.3.1. Set appropriate values for how long to keep Capacity History.
    4.5.3.2. Set appropriate values for the retention of Performance Data
    4.5.3.3. Set appropriate value for Data for Missing Resource retention.
    4.5.3.4. Set the value for number of Job logs to retain
4.5.4. Save History Retention.

4.6. Given Cognos is installed and a customer requirement for capacity and performance reporting for all resources managed and monitored by the Spectrum Control server, create, schedule, and run reports by using the WEB UI so that reports can be generated using Cognos.

SUBTASK(S):
4.6.1. Log in to IBM Spectrum Control environment WEB UI.
4.6.2. In the WEB UI -> Cognos ->View Predefined Reports
4.6.3. Create a customized performance or capacity report.
4.6.4. Select a pre-defined template based on customer requirements.
4.6.5. Select appropriate columns to create report based on customer requirements.
4.6.6. Save report to specified customer location with scheduled intervals when to run.
4.6.7. Verify report has been saved.

4.6.8. Execute report.

4.7. Given a requirement to monitor and view performance for specific storage systems, switches and their internal resources using IBM Spectrum Control view the performance of specific storage systems, switches and their internal resources so that performance metrics are displayed.

SUBTASK(S):
4.7.1. Access the performance view in the WEB UI.
4.7.2. In the menu bar, select the type of resource you want to view
For storage systems, Storage -> Storage Systems
For switches, Network -> Switches
4.7.3. Right-click a resource and select View Performance
4.7.4. Real-time performance of a storage subsystem can be monitored and viewed for the following Storage Subsystems:
SAN Volume Controller
Storwise V3500
Storwise V3700
Storwise V5000
Storwise V7000
Storwise V7000 Unified System

4.8. Given Storage Resource with Pools has been configured to IBM Spectrum Control and probe has been running successfully for more than 1 month, monitor and view historical capacity data for pools of a specific storage systems, using IBM Spectrum Control so that a projection can be made as to when a pool will run out of space.

SUBTASKS:
4.8.1. Access the Storage subsystems overview (Storage -> Block Storage systems -> specific Storage system) in the WEB UI.
4.8.2. In the menu bar, select Pools of the storage system you want to view
4.8.3. Select the capacity Tab
4.8.4. Adjust the timeframe either relatively (on the left top of the chart or absolute (on the left bottom of the chart)
4.8.5. Right click on the header of the table below the chart and checkmark “Zero Capacity”

4.9. Given the storage subsystems are configured and probe is running successfully and the license/terabyte is known, verify managed capacity and check licensing so that it can be determined that the total capacity of the storage systems that are being managed does not exceed the licensed capacity limit.

SUBTASKS:
4.9.1. Open WEB UI for IBM Spectrum Control

4.9.2. Go to Settings->Managed Capacity
4.9.3. Verify the number of terabytes that are included in the current license

4.10. Given a working IBM Spectrum Control environment and customer requirements, interact with groups so that groups can be monitored to assist with hierarchical insights around capacity and performance.

SUBTASK(S):
4.10.1. Create an application hierarchy with subcomponents
4.10.2. Add/remove resources to applications
4.10.3. Remove applications and subcomponents
4.10.4. Create a department hierarchy with subdepartments
4.10.5. Add/remove applications to departments
4.10.6. Remove departments and subdepartments
4.10.7. Manage applications and departments with CLI commands
4.10.8. View application and department hierarchies
4.10.9. Model applications using file storage resources
4.10.10. Export information about applications and departments

4.11. Given a well defined storage environment, assign Tiers to Storage Pools so that storage pools can use the VSC enhanced functions.

SUBTASK(S):
4.11.1. In the WEB UI navigation pane, expand Advanced Analytics
4.11.2. Click Cloud configuration,
4.11.3. Click Assign Storage to Tiers.
4.11.4. Select the Storage pools and assign appropriate tier by right click

4.12. Given an installed IBM Spectrum Control server and DB2 database, administer the database so that the server and database are fully functioning.

SUBTASK(S):
4.12.1. Back up the database with an offline backup or optionally back up with online backup.
4.12.2. Maintain and improve the performance of the database.
4.12.3. Gather data from the repocopy tool.
4.12.4. Check the database and database manager configuration files.
4.12.5. Generate a db2support package.
4.12.6. Locate the db2diag.log.
4.12.7. Archive the db2diag.log.
4.12.8. Restore database from the offline backup.
4.12.9. Run DB2 maintenance tool

4.13. Given a functioning IBM Spectrum Control server and properly configured devices interact with storage, servers and network entities including Access Gateway /NPV Switches and navigate the WEB UI so that properties and

details can be viewed to gather information based on customer requirements.

SUBTASK(S):

4.13.1. Through the WEB UI:

- 4.13.1.1. View information about volumes in mirrored volume relationships
- 4.13.1.2. View information about NPIV connections for switch ports in a fabric
- 4.13.1.3. View inter-switch connections types (such as: ISL Trunk, ISL, F_Port Trunk or NPV Link)
- 4.13.1.4. View NPV Internal Traffic Routes
- 4.13.1.5. View information about Virtual Machine Disks (VMDKs)
- 4.13.1.6. Configure a network entity using SNMP and probe the switch.
- 4.13.1.7. View information about multiple paths on server or hypervisor disks

Section 5 - Troubleshooting

5.1. Given a functioning IBM Spectrum Control, check for successful probes and performance monitor jobs, review reports, output reports/ logs, and displays so that analysis of functionality can be accomplished.

SUBTASK(S):

5.1.1. Check for applicable workload runs in WEB UI and their output logs. (i.e. probes and performance monitor jobs).
5.1.2. Check Reports.
5.1.3. Investigate Alerts Tab from WEB UI Home Screen.
5.1.4. Check application component logs.
5.1.5. View details page of entities in WEB UI by right clicking and 'view details' (i.e. switch/fabric, storage subsystem, SRA).
5.1.6. View enhanced troubleshooting information in the WEB UI.

5.2. Given an IBM Spectrum Control installation at a customer site, determine the status of the components, stopping and starting the components so that it can be determined that IBM Spectrum Control is working properly.

SUBTASK(S):

5.2.1. Determine the state of each of the components processes or services (i.e. data server, device server, JazzSM, Cognos, WEB UI, DB2, Alert Server, etc.).
5.2.2. Stop the processes or services.
5.2.3. Start the processes or services.
5.2.4. Check the Device Server Manger URL
5.2.5. Check the status of DB2

5.3. Given an installed IBM Spectrum Control server and Internet access, gather data from service tool, repocopy tool, logs and output reports so that application data logs and tools output can be assembled and sent to IBM Support via the PMR process.

SUBTASK(S):

5.3.1. Contact IBM support via phone to open a PMR or open a PMR ticket using the ESR Tool.
5.3.2. Gather concise problem description/symptoms including supporting screenshots.
5.3.3. Generate and collect data from the IBM Spectrum Control service tool.
5.3.4. Gather data from the repocopy tool to be used by Support for analysis.
5.3.5. Gather any relevant IP information and logs from the specific entity presenting the issue.
5.3.6. Upload data to the PMR

5.4. Given errors in running data collection jobs or to the entity itself, configure error monitoring so that the IBM Spectrum Control administrator can be alerted.

SUBTASK(S):

5.4.1. Consider the type of alerts required be configured within IBM Spectrum Control V5.2, which are the most critical to a particular organization.
5.4.2. Insure IBM Spectrum Control is configured to send alerts to desired real time monitoring system or email (SNMP, OMNIbus, NetCool, Email, etc) in the Spectrum Control WEB UI -> Settings -> Alert Notifications.
5.4.3. Configure a particular target/entity for alerting by right clicking the entity in the WEB UI and selecting 'Edit Alert Definitions' and/or 'Edit Alert Notifications Settings'.
5.4.4. Define alerts for configuration changes and performance problems on monitored resources.
5.4.5. Check the Alert tab of the entity in the WEB UI to view realized alerts.

5.5. Given a failure of scheduling jobs or tasks and configured alerting, determine the root cause of the failure so that it can be corrected.

SUBTASK(S):

5.5.1. Log in to Spectrum Control WEB UI.
5.5.2. Select Home -> Alerts
5.5.3. View the alerts that are listed and highlight the item of interest
5.5.4. Select Action drop down -> View Alert
5.5.5. View status of alerts and take appropriate action.
5.5.6. Acknowledge or remove the alert
5.5.7. If jobs continue failing, contact vendor support or open a PMR ticket with IBM support.
5.5.8. Select Home -> Task
5.5.9. View status of tasks and take appropriate action.

5.6. Given a successful IBM Spectrum Control server installation, check various locations for successful completion of daily tasks, performance metrics and alerts so that the system is running efficiently

SUBTASK(S):

5.6.1. Check Home page -> dashboard panel to check status of all monitors and alerts and in case of errors take appropriate action.
5.6.2. Check Home -> Tasks to determine task status and take appropriate action in case of errors.
5.6.3. Drill down via WEB UI for specific devices to gather information on the view properties, details and performance panels if required.
5.6.4. Check appropriate source (Email, monitoring software if enabled.

5.7. Given a customer's Spectrum Control environment has encountered errors, define necessary steps to configure tracing to aid in problem determination as directed by the IBM support team so that message logging is enabled and enhanced.

SUBTASK(S):
5.7.1. Open the WEB UI.
5.7.2. Select Home -> System Management-> Component Servers.
5.7.3. Under each component select the level of tracing as advised by technical support
5.7.4. Re-create the error
5.7.5. Generate the service tool and upload data to the PMR
5.7.6. Change the tracing back to the original level

5.8. Given a Spectrum Control installation with error conditions and Internet access, use the menus to generate relevant log files online so that gathered information can be used for troubleshooting.

SUBTASK(S):
5.8.1. Open the WEB UI.
5.8.2. Select Home -> System Management -> Create Logs or run the Service Tool
5.8.3. Record the log location and upload as directed by technical support

Section 6 - Advanced Analytics

6.1. Given a functioning IBM Spectrum Control server with advanced licensing, a requirement to analyze storage tiers using IBM Spectrum Control and volumes/pools residing on the same SVC, optimize the placement of volumes on storage tiers and analyze the tiering of volumes so that recommendations are generated and displayed to ensure that the volumes are placed on tiers that best match the workload requirements of the volumes.

SUBTASK(S):

6.1.1. Access the performance view in the WEB UI.

6.1.2. Tier Analysis by

- 6.1.2.1. Server
  - 6.1.2.1.1. From the Server menu, click Servers
  - 6.1.2.1.2. Right-click one or more servers and select Analyze Tiering
- 6.1.2.2. Hypervisor
  - 6.1.2.2.1. From the Server menu, click Hypervisor
  - 6.1.2.2.2. Right-click one or more hypervisors and select Analyze Tiering
- 6.1.2.3. Storage
  - 6.1.2.3.1. From the Server menu, click Storage Systems
  - 6.1.2.3.2. Right-click one or more storage subsystems and select Analyze Tiering
- 6.1.2.4. Storage Pools
  - 6.1.2.4.1. From the Storage -> Pools, click Pools
  - 6.1.2.4.2. Right-click one or more storage pools and select Analyze Tiering
- 6.1.2.5. Volumes
  - 6.1.2.5.1. From the Storage menu, click Volumes
  - 6.1.2.5.2. Right-click one or more volumes and select Analyze Tiering

6.2. Given a functioning IBM Spectrum Control with Advanced Edition license and properly configured storage devices with volumes/pools residing on the same SVC, balance pools so that storage performance is optimized.

SUBTASK(S):

6.2.1. Schedule an analysis task to run on a selected storage system

6.2.2. Define policies

6.2.3. Review IBM Spectrum Control suggestions on which volumes to move to a different pool and shows the estimated performance changes

6.2.4. Execute the recommendations manually

6.3. Given a successful IBM Spectrum Control server installation, work with Capacity Pools so that Capacity Pools can be used to separate storage resources in a way that serves the needs of the environment or business.

SUBTASK(S):

6.3.1. Create a capacity pool
A capacity pool can be created from several places in the WEB UI.
expand Advanced Analytics, click on Cloud Configuration, select Work with Capacity Pools, select either to add from storage device view or Storage pool view any Storage System or Storage Pool view
6.3.1.1. select the Storage device(s) or the Storage pool(s) that are candidates for a Capacity Pool
6.3.1.2. right click, select add to Capacity Pool, the Capacity Pool page will show up
6.3.1.2.1. to add to a new Capacity Pool, click Create Capacity Pool, provide a name, optionally a description and a resource tag and Click OK.
6.3.1.2.2. to add to an existing Capacity pool, select the desired Capacity Pool, click Save.
6.3.2. View/Modify Capacity Pool
6.3.2.1. expand Advanced Analytics, click on Cloud Configuration, select Work with Capacity Pools, the Capacity Pools will be displayed
6.3.2.2. right click on the Capacity Pool, select remove to remove the whole pool or view/modify to modify the Capacity Pool
6.3.2.3. in view/modify mode, view or change capacity pool name, description or resource tag. To remove Storage Pools from the Capacity Pool, right click the Storage Pool and select remove. Click Save to store the modification

6.4. Given an installed IBM Spectrum Control server with advanced licensing and a known Storage environment classification, define Service Classes and assign Tiers or a range of Tiers to it so that server classes are created.

SUBTASK(S):
6.4.1. Go to Advanced Analytics -> Cloud Configuration -> Work with Service Classes -> Create Service Classes to specify the storage requirements by specifying a service class.
6.4.2. Select ‘view’ to open the ‘Service Class’ windows
6.4.3. Select ‘Create Service Class’ and choose Block or File type.
6.4.4. Define properties for the Service Class and assign Tiers or a range of Tiers to the Service Class.
6.4.5. Select ‘Advanced’ to edit advanced properties.
6.4.6. Authorize Users of the Service Class
6.4.7. Save and Exit
6.4.8. Re-open newly created Service Class to interact as required.

6.5. Given a working IBM Spectrum Control environment with advanced licensing and customer requirements with volumes residing on an SVC, perform storage optimization by transforming volumes in storage virtualizer pools so that recommendations from analysis and implement volume provisioning state changes within a storage virtualizer can be reviewed.

SUBTASK(S):

6.5.1. Verify requirements are supported.

6.5.2. Using Transform Storage wizard create a transform-plan task in WEB UI, go to Storage -> Volumes select one or more storage volumes, select Transform Storage to input desired actions.

6.5.2.1. Move volumes between pools in the same storage virtualizer

6.5.2.2. Convert volumes between provisioning states (fully allocated <-> thin)

6.5.2.3. Convert volumes between provisioning states (fully allocated <-> compressed)

6.5.2.4. Move a volume into an easy tier-based pool.

6.5.3. In WEB UI from the menu bar, go to Tasks page and select the transform-plan task already created and either Run Now or schedule a time for the task to be performed to generate analysis recommendations.

6.5.4. In WEB UI from the menu bar, go to Tasks page and select the transform-plan task already created and select View Details. Click Execute to initiate an analysis-execution task to be created and implemented.

6.6. Given a successful IBM Spectrum Control server installation with advanced licensing, provision storage to a server/cluster using Provisioning in the Advanced Analytics section so that additional storage will be provided to a Server/Hypervisor.

SUBTASK(S):

6.6.1. In the WEB UI expand Advanced Analytics, click Provisioning

6.6.2. Set Zoning Policy – Automatic Zoning to disable or enable

6.6.2.1. if Enabled, Define a Zone Name Prefix

6.6.2.2. mark or unmark Make changes to the active zone set

6.6.3. Provision to Servers or Hypervisor

6.6.3.1. select server(s) candidate, right click, select Provision Storage

6.6.3.2. click on volumes or shares

6.6.3.3. define Name, Capacity, service Class and Capacity pool

6.6.3.4. for more volumes, click Add more and repeat 6.5.3.3

6.6.3.5. click Next to start Provisioning analysis

6.6.3.6. check recommendations, then choose execute / schedule / close /delete.

Next Steps

1. Take the IBM Spectrum Control V5.2.7 Implementation assessment test using the promotion code AAASYSMIDBP for $10 ($20 USD savings).

2. If you pass the assessment exam, visit pearsonvue.com/ibm to schedule your testing sessions. Use the promotion code sysmidguide to receive 20% off.

3. If you failed the assessment exam, review how you did by section. Focus attention on the sections where you need improvement. Keep in mind that you can take the assessment exam as many times as you would like ($10 per exam), however, you will still receive the same questions only in a different order.