14.5.2 Orchestration Processes and Concepts Facts

This lesson covers the following topics:

- Orchestration application
- Orchestration implementation
- Procedures and attributes

Orchestration Application

Orchestration is the automated configuration, coordination, and management of computer systems and software. Orchestration takes advantage of several tasks that are usually automated to create a more complex workflow.

Orchestration can be used for workflow needs, such as:

- Server provisioning
- Configuration management
- Inventory
- Automated builds and code deployments

Orchestration is used for many types of workflows, including:

- Infrastructure automation, where computers or workloads can be provisioned with features such as storage attachments, security lists, and so on.
- Infrastructure as code, or IaC, the process of managing and provisioning computer data centers.
- Management and monitoring inventory. This could be the inventory of computer systems and workloads in your IT environment, or inventory and fulfillment processes to support online procurement with multi-channel distribution.
- Configuration management, such as building and maintaining large-scale computer systems. Automated configuration and resource management is a method for maintaining computer systems and software in a known, consistent state.
- Software build automation, the process of automating the creation of a software build and all the typical processes that go along with it, such as compiling the code, packaging the code, deploying the code, and then running automated tests to verify the new code.

Orchestration Implementation

There are many types of orchestration tools. The tools you choose will depend on the types of workflows you need to orchestrate in your environment. When orchestration is executed well, the workflows free up time for the team members to take on more important projects, which yields long-term benefits. IT costs decrease and processes are more consistent.

To orchestrate processes among various types of computers and infrastructure hardware, the orchestrator needs to be able to communicate with the devices it monitors and manages. This communication can take place through a specific agent on each device, or it can be agentless.

When using an agent:

- A proprietary software application is installed on each device that you wish to monitor or control.
- Communicate with the orchestration system if facilitated by the agent.
- It can be somewhat more difficult to deploy and can be more expensive.
- The agent can be programmed to monitor systems, evaluate data, and thoroughly process the data on the device.

Agentless orchestration does not require a proprietary software agent on the managed hosts. However, all management tools require some kind of software, or agent, to run on the host device. The main advantage of agentless orchestration is that the setup of each host device is simple.

Agentless orchestration:

- Is done using existing industry-standard management systems that are already built into devices or operating systems, such as SSH, SNMP, and CIM, and the Windows programs WMI and WinRM.
- Can be pushed out across targets that don't have a specific software agent installed.
- Can be used to install an agent.

Most companies use a mix of agent and agentless orchestration, choosing a method on a case by case basis to meet each situation's needs.

Procedures and Attributes

Orchestration uses defined procedures and scripts rather than manual processes to perform operations. An orchestration's configuration is defined with various attributes. For example:

- A typical orchestration could include the name and a description of the orchestration, the start and stop times for the orchestration, and the resources being controlled.

- An orchestration that creates computers might need the hostname for the computer or information about the network configuration.
- An orchestration that creates a user would include the given name, title, and employee ID. Attributes that identify the specifics for this instance of the orchestration can be passed in from other interfaces and tools.
- Attributes can also be used to specify whether the orchestration performs a particular task or whether to branch the orchestration in a different direction.
