14.5.1 Orchestration Processes and Concepts

Click one of the buttons to take you to that part of the video.

[Orchestration Processes and Concepts 0:00-0:49]

Orchestration is the automated configuration, coordination, and management of computer systems and software.

The term automation usually refers to setting up a single task to run on its own. Orchestration, on the other hand, is a process that takes advantage of several tasks that are usually automated to create a more complex workflow.

Orchestration can include many kinds of workflow needs, such as server provisioning, configuration management, inventory, automated builds, code deployments, and monitoring.

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. Your IT costs will decrease, and your processes will be more consistent.

[Agent vs. Agentless 0:50-2:29]

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. This agent is then used to communicate with the orchestration system. Because the agent is proprietary software, it can be somewhat harder to deploy and can be more expensive. On the other hand, a custom agent can be programmed to monitor systems and evaluate data more deeply and more thoroughly process the data on the device.

Agentless orchestration, as the term suggests, does not require a proprietary software agent on the managed hosts. However, the term "agentless monitoring" is a bit of a misnomer, since all management tools require some kind of software, or agent, to run on the host device.

The trick is that agentless orchestration is done through 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.

With agentless orchestration, changes can be pushed out across targets that don't have a specific software agent installed.

For example, you can update a package or restart a server. You can even use agentless orchestration to install an agent to improve your ability to access, monitor, and control systems.

The main advantage of agentless orchestration is that the setup of each host device is simple.

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

[Procedures and Attributes 2:30-3:25]

Orchestration uses defined procedures and scripts, rather than manual processes, to perform operations.

An orchestration's configuration is defined with various attributes.

For example, the orchestration as a whole could include the name and a description of the orchestration. It could include the start and stop times for the orchestration. These types of parameter are defined with the orchestration's attributes.

An orchestration that creates computers might need the hostname for the computer or information about the network configuration. You can provide these through specified attributes in the orchestration's configuration files.

For an orchestration that creates a user, the attributes specified may include the given name, title, or 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.

Uses of Orchestration 3:26-4:48

Orchestration is used for many types of workflows.

For example, it can be used for infrastructure automation, where computers or workloads can be provisioned with features such as storage attachments, security lists, and so on, all associated automatically.

It is also used for infrastructure as code, or IaC. IaC is the process of managing and provisioning computer data centers. In the old days, we used to set up physical hardware and configure each machine manually. IaC now automates these processes.

Orchestration is also used to manage and monitor inventory. This could be the inventory of computer systems and workloads in your IT environment, or it could be the inventory and fulfillment processes needed to support today's online shoppers and multi-channel distribution.

Orchestration is also helpful for automated configuration management. Building and maintaining large-scale computer systems can be a resource-intensive and error-prone endeavor. Automated configuration and resource management is a method for maintaining computer systems and software in a known, consistent state.

And finally, orchestration can be used for build automation, which is 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. Tools that orchestrate build processes allow the automation of various simple, repeatable tasks.

Summary 4:49-4:58

That's it for this lesson.

In this lesson, we learned about orchestration.

We introduced agent orchestration and agentless orchestration.

We discussed orchestration attributes, and we saw various examples of orchestration's benefits.