



Systems Operations on AWS

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Welcome to the lesson titled Systems Operations on Amazon Web Services (AWS).

What you will learn



At the core of this lesson

You will learn how to describe systems operations (SysOps) and automation in the cloud.

This lesson provides an introduction to systems operations (SysOps). It describes the overall responsibilities of a SysOps professional and highlights the importance of automation in the cloud.

What is systems operations (SysOps)?

Systems operations (SysOps) is concerned with the deployment, administration, and monitoring of systems and network resources in an automatable and reusable manner.



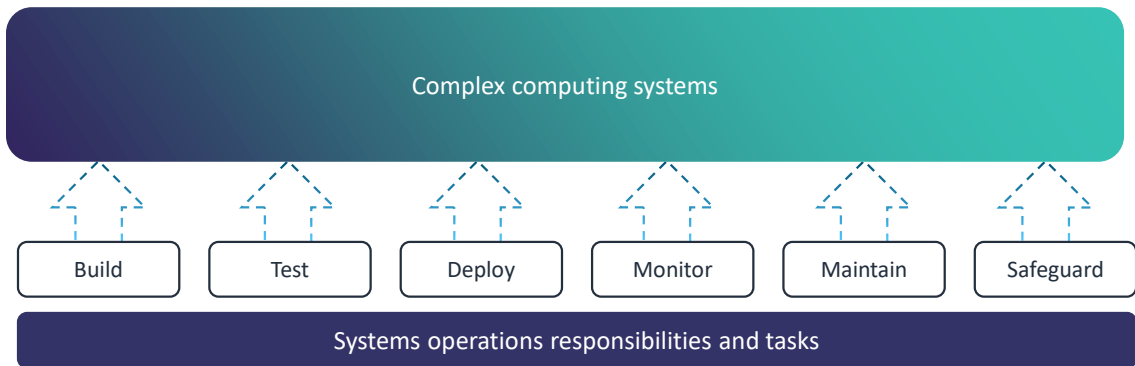
SysOps contains critical tasks that keep many companies running today. SysOps supports technical systems by monitoring them and helping ensure that their performance meets expectations and is trouble-free. SysOps typically requires understanding a system's entire environment.

Benefits of SysOps include the following:

- Ability to configure and manage thousands of servers and devices in a repeatable way
- Reduction in errors by replacing manual processes with automated ones
- Real-time visibility into the state of the infrastructure through monitoring

Systems operations: Responsibilities

SysOps professionals are involved in many—and often all—facets of delivering IT solutions.



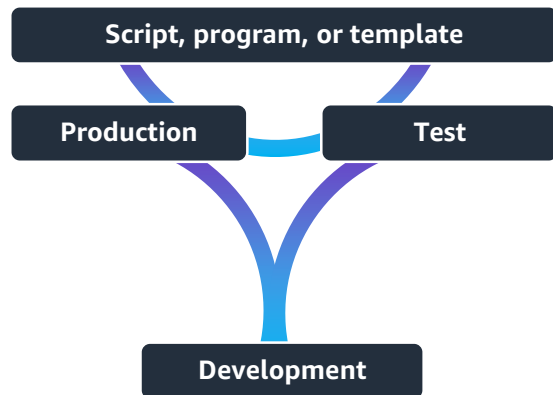
SysOps involves the responsibilities and tasks required to build (create), test, deploy, monitor, maintain, and safeguard complex computing systems. Examples of these tasks include the following:

- Build: Create separate environments for development, test, and production.
- Test: Test backup and disaster recovery procedures.
- Deploy: Deploy applications and workloads into their runtime environment.
- Monitor: Monitor the health and performance of infrastructure resources.
- Maintain: Apply patches and upgrades in a consistent and regular manner.
- Safeguard: Apply and enforce security measures in all the infrastructure layers.

SysOps professionals typically use automation because of the large size of the infrastructure.

Systems operations in the cloud

- Cloud computing provides organizations the ability to automate the development, testing, and deployment of complex IT operations.
- Automation of SysOps provides the following:
 - Repeatable deployment of infrastructure and applications on demand
 - Creation of self-describing systems
 - Ability to build well-tested, secure systems



Consider the concept of automation, which plays a vital role in SysOps. Instead of building pieces of a complex computing infrastructure manually, you can define the pieces declaratively or programmatically and use automated methods to create them.

You can accomplish automation by creating scripts, programs, or templates, such as the following:

- A Linux shell script
- A Python or Ruby application
- A C# application
- A template format, such as what is used in the AWS CloudFormation service

The cloud facilitates the automation of SysOps tasks. For example, you can provision computing resources in minutes in the cloud through a completely automated script. However, in an on-premises environment, the same process could require days and a manual intervention if you need to procure and wait for more hardware.

For more information, see “Getting started with AWS CloudFormation” at <https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/GettingStarted.html>.

Checkpoint questions

1. True or False: SysOps supports technical systems by monitoring systems and helping ensure that system performance is accurate and trouble-free.
2. True or False: SysOps involves the responsibilities and tasks required to build (create), test, deploy, monitor, maintain, and safeguard complex computing systems.
3. True or False: SysOps professionals can create reusable infrastructure templates by using the AWS Identity and Access Management (IAM) service.



The following are answers to the checkpoint questions:

1. True or False: SysOps supports technical systems by monitoring systems and helping ensure that system performance is accurate and trouble-free.

True

2. True or False: SysOps involves the responsibilities and tasks required to build (create), test, deploy, monitor, maintain, and safeguard complex computing systems.

True

3. True or False: SysOps professionals can create reusable infrastructure templates by using the AWS Identity and Access Management (IAM) service.

False, SysOps professionals use AWS CloudFormation to create these templates.


Key ideas



- SysOps supports technical systems by monitoring them and helping ensure that their performance meets expectations and is trouble-free.
- SysOps professionals are responsible for the administration of large, multiuser systems.
- Automation provides the ability to create deployable, reusable infrastructure in the cloud.
- SysOps includes the development of reusable infrastructure templates.

This lesson includes the following key takeaways:

- SysOps supports technical systems by monitoring them and helping ensure that their performance meets expectations and is trouble-free.
- SysOps professionals are responsible for the administration of large, multiuser systems.
- Automation provides the ability to create deployable, reusable infrastructure in the cloud.
- SysOps includes the development of reusable infrastructure templates.



Troubleshooting Knowledge Base

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Next, you'll look at a project that will last through all of the upcoming topics.

Project introduction

Creating a Troubleshooting Knowledge Base

- This section of the course includes a project that challenges you to build a Troubleshooting Knowledge Base.
- The instructor will introduce the project to you and provide the project details, which are included in the **Build a Troubleshooting Knowledge Base** document.

At the end of this project, you will be able to do the following:

- **Describe** common technical challenges that users face when they attempt to deploy, upgrade, and maintain AWS Cloud deployments.
- **Explain** how to overcome specific technical challenges by confirming and adjusting deployment configurations as necessary.
- **Present** troubleshooting techniques to stakeholders.

Throughout this section of the course, this project will help you to hone your skills for identifying your customers' key issues and concerns. These concerns will often indicate a technical issue. As you troubleshoot the issues that you encounter while you build project solutions, documenting each issue and your solution will help you remember technical details. In addition, reviewing technical problems and solutions might reveal patterns that will help you troubleshoot additional issues. By updating the Troubleshooting Knowledge Base, you can document your troubleshooting steps to create a reference guide that you can use in the future.

Activity steps

Troubleshooting Knowledge Base

In this activity, you will do the following tasks:

- Open your copy of the Troubleshooting Knowledge Base template for editing.
- Create new entries as you encounter troubleshooting situations.

The following are the categories of focus for this lesson:

- Security and compliance
- Foundational IT

Issue #	Category	Issue Description	Symptoms	Root Cause Analysis
Example One	Networking	Application on Amazon EC2 instance - connectivity issue	Could not connect to an existing web site. Was able to successfully connect yesterday. Tried different browsers and got the following errors: - Firefox: The connection has timed out. The server at ec2-34-221-214-86.us-west-2.compute.amazonaws.com is taking too long to respond. - Chrome: This site can't be reached ec2-34-221-214-86.us-west-2.compute.amazonaws.com took too long to respond. ERR_CONNECTION_TIMED_OUT	The instance was no longer running. Perhaps someone stopped it and then it was restarted, because the URL to connect to it changed, as well.
Example two	Networking	SSH to EC2 instance issue	Could not SSH to a running EC2 instance. ssh -i key.pem ec2-user@publicip Received error "Network error: Connection timed out".	There were two issues. First, the permissions were not correctly set on the key pair. Also, the security group did not allow traffic on port 22.
Example three	Foundational IT	Out of disk space on an EC2 instance	Application on an instance stopped running.	The instance ran out of disk space.
Example four	Foundational IT	Linux service stopped running	Web page hosted on an instance was not loading (page not found error).	The web server wasn't running.

You have now been introduced to the Troubleshooting Knowledge Base project, and you know how to create new knowledge base entries. Next, you should be ready to create some entries based on the topics that this lesson covers.

One of the key topics of this lesson is the IAM service. As a result, you will have opportunities to add security and compliance category entries to your knowledge base.

Also, during the hands-on activity that follows this lesson, you will install, configure, and use the AWS Command Line Interface (AWS CLI). You might need to troubleshoot any installation or configuration issues in the Linux terminal (or with the AWS CLI). If so, you can also create entries that are related to the foundational IT category.



Thank you



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Thank you for completing this lesson.