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AWS DevOps Engineer Tutorial

Published On: July 20, 2024

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AWS offers services to assist companies in implementing DevOps in various ways. In this AWS DevOps engineer tutorial, you will learn the required skills to start your learning.

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Introduction to AWS DevOps

AWS and DevOps technologies maintain engineers in control of the high pace that DevOps enables, automate tedious processes, and assist teams in managing complex settings at scale.

This A**WS DevOps Engineer tutorial** covers the following concepts:

- Fundamentals of Python Programming
- Fundamentals of Linux Programming
- Fundamentals of Networking
- Cloud Computing Concepts
- Amazon Web Services
- DevOps and DevOps Tools

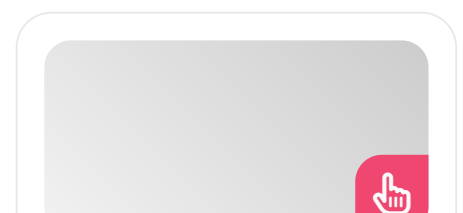## Fundamentals of Python Programming

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Some key concepts can be identified in basic Python, including variables, data types (float, strings, and int), and Compound data structures, such as dictionaries, tuples, lists Loops, functions, and conditionals.

Variables

Python's dynamic typing enables the definition of variables without specifying their data types. It includes:

- Variable Declaration
- Type Inference
- Type Conversion
- Function Arguments and Return Types

Control Structures

It covers control statements and loops

Functions

You will learn the following in this part:

- Function Parameters
- Scope and Global Variables

Data Structures

Some of the most popular Python data structures are listed below:

- Lists
- Tuples
- Sets
- Dictionaries
- Strings
- Nested Lists
- Stacks and Queues

Object Oriented Programming in Python

The paradigm of Object-Oriented Programming (OOP) strongly emphasizes the division of code into independent, reusable units called objects.

Python is an object-oriented, multipurpose programming language that encourages

developers to use OOP to create modular, maintainable software.

Objects and Classes: An object is a stand-alone part with functionality (methods) and data (attributes). There are instances of classes that are objects.

Encapsulation: Encapsulation's fundamental idea is to combine methods that manipulate data and data (attributes) into a class. Python uses access modifiers to accomplish encapsulation.

Public: A method or feature can be accessed from outside the class.

Protected: An underscore (_) is appended to attributes and methods (such as _protected_variable) to indicate that they are intended only for internal use.

Private: A double underscore (__) is appended to attributes and methods to denote that they should not be accessed directly (e.g., __private_variable).

Inheritance: A key idea in object-oriented programming (OOP) is inheritance, which allows you to base a subclass or derived class (new class) on a base class or parent class (existing class). The subclass can expand or replace the features and functions of the base class.

Polymorphism: The capacity of different objects to react appropriately to a method or function call in every situation is known as polymorphism.

Abstraction: The process of abstraction involves suppressing irrelevant information and classifying objects according to their core traits and behaviors to reduce complexity. To achieve abstraction, abstract base classes can be created using the Python 'abc' module.

Exception Handling

The ability to handle errors and exceptions that may

arise while a program is being executed is one of the most crucial parts of Python programming.

- The try and except blocks
- Handling Multiple Exceptions
- Catching All Exceptions

File Handling

Python offers a simple and flexible file-handling system.

Opening and closing of files: Use the open() function first before you may read from or write to a file. The two arguments that the open() function takes are the file path and the mode.

Libraries and Modules

Using Third-Party Libraries: Thousands of third-party libraries and modules are part of the vast Python library ecosystem. These libraries can be installed and used to increase Python's functionality for particular tasks.

Lambda Functions

Lambda functions, also called anonymous functions, are small functions that can be defined in a single line and support only one expression. They are commonly used for both simple operations and higher-order functions like map and filter as arguments.

Web Scraping

You will learn to use web scraping tools for parsing HTML and submitting HTTP requests, which are available in Python modules like Beautiful Soup and Requests.

Database Connectivity

Python supports a wide range of database systems, including PostgreSQL, MySQL, and SQLite. Building data-driven apps requires the ability to execute SQL queries and establish connections to databases.

Virtual Environments

By enabling you to establish separate environments with their dependencies, virtual environments help you avoid conflicts between packages used in various projects.

[AWS DevOps Syllabus PDF](#)

Fundamentals of Linux Programming

A variety of operating systems are built on top of the open-source Linux operating system kernel. In 1991, Linus Torvalds developed it. It has since developed into one of the most potent operating systems out there.

Features of Linux

- Open-source
- Dependable
- Multitasking and multiuser functionality
- Security
- Portability
- Command-Line Interface (CLI)

Linux Kernel

The central component of the Linux operating system is the kernel. It serves as a link between software and hardware.

Its primary duties include directing the interface to the input/output (I/O) devices attached to the computer, sharing resources with several users, managing files and directories, and overseeing the operation of multiple applications.

Additional features consist of:

- Process management
- Memory management
- Hardware and operating system components to communicate.
- Oversees access control and file authorization.

Linux File System Structure

Navigating and organizing the system is made

easier with an understanding of the Linux file system structure.

- **Root Directory (/):** All other folders and files are located in the root directory (/)
- **/bin and /sbin:** The important binary executables for system users and system binaries are located here.
- **/home:** home directory for normal users on the system.
- **/etc** is the configuration file for the system.
- **/var** is the variable file, which includes logs, spool files, and temporary files.
- **/usr** is user-related data and applications.
- **/tmp** is the temporary file.

Linux Distributions

A Linux distribution is a full collection of packages that gives customers an operating system that is ready to use. The kernel, system utilities, libraries, and other software programs are all included in these packages.

Among the most well-liked distributions are:

- Ubuntu
- Fedora
- Debian
- Arch Linux

How to Select the Appropriate Distribution

- Skill level
- Use case
- Package management
- Support from the community
- Desktop environment

Fundamentals of Networking

Devices linked to your network can talk to each other and other networks, including the Internet, via them. In a network, switches, routers, and wireless access points have rather diverse purposes.

Switches: Most business networks are built around

switches. Switches serve as controllers, joining servers, printers, and PCs to a building's or campus's network.

When it comes to the fundamentals of networking, there are two types of switches to select from: on-premises and cloud-managed.

- **On-premises:** You may tighten control over your network traffic by configuring and monitoring your local area network (LAN) using a managed on-premises switch.
- **Cloud-managed:** Simplifying network management is possible with a cloud-managed switch. A straightforward user interface, multisite full-stack management, and switch-direct updates are all included.

Routers: Routers link the PCs on those networks to the Internet as well. Routers allow all networked computers to share a single Internet connection, which lowers costs.

Access Points: Devices can connect wirelessly to a network without the need for cords using an access point. Adding new devices to the network is simple with a wireless network, which also offers mobile workers flexible support.

Wireless Networking

You have three deployment options to select from when setting up your wireless network: centralized deployment, converged deployment, and cloud-based deployment.

Centralized Deployment: Campuses with close-knit buildings and networks typically employ centralized installations.

Converged Deployment: With this deployment, wired and wireless are combined onto a single network device, an access switch, which serves as both a switch and a wireless controller.

Cloud-Based Deployment: This solution deploys

network devices on-premises at multiple locations and manages them via the cloud.

Cloud Computing Concepts

The Internet is known as the cloud, and the term "cloud computing" refers to software and services that operate online (or over an intranet) as opposed to on dedicated servers and hard drives.

The functioning of cloud computing: Whether a business, organization, or individual user, cloud computing is different from traditional IT hosting services in that the user often does not own the infrastructure required to operate the programs or applications they utilize.

Features of Cloud Computing

Below are the advantages of cloud computing:

On-demand self-service: When needed, users can use cloud computing services without contacting the service provider.

Broad network access: Users can access cloud computing services via their preferred devices, such as laptops, desktop computers, smartphones, and other devices, via the network.

Resource pooling: Depending on demand, resources like memory, computing power, storage, and network bandwidth are shared and distributed across several users.

Rapid elasticity: Accurate and timely resource assignment is necessary to accommodate large variations in demand without compromising quality or causing service disruptions.

Measured service: Through this measurement, both the service provider and the customer can monitor usage and determine pricing based on

resource demand.

Cloud Service Models

Platform as a Service (PaaS), Software as a Service (SaaS), and Infrastructure as a Service (IaaS) are the three main service models available for cloud solutions.

IaaS: IaaS offers automated, scalable settings that provide users with a great deal of flexibility and control.

Well-known IaaS suppliers are:

- Amazon Web Services (AWS)
- Microsoft Azure
- Google Compute Engine (GCE), the IaaS component of Google Cloud Platform (GCP).

PaaS: Building, customizing, and deploying apps is made simpler and more effective with the help of the framework that PaaS offers.

SaaS: Businesses can deflect management and maintenance expenses from themselves to the vendor(s) by distributing the software program via the Internet. Software for customer relationship management and email are common SaaS choices.

Types of Cloud Computing

Private, public, and hybrid clouds are the three primary categories of cloud service possibilities. Which one you (or your company) choose will depend on your data as well as the degree of security and administration you require. Each has pros and cons of its own.

Public: Most people's first exposure to cloud computing is presumably with public clouds. In this case, the services and infrastructure that support them are all common to numerous users and are administered remotely via the Internet.

Private: Instead of serving the entire public, a

private cloud offers IT services to a limited number of users over a private network or the Internet.

Hybrid: To varied degrees, both private and public cloud components are combined in a hybrid cloud architecture. The clouds in a hybrid environment cooperate via an encrypted link and permit data and application portability even if they function independently.

Advantages of Cloud Computing for Businesses

Using cloud-based solutions has a lot of potential benefits for your company. Moving to a cloud environment can yield the following advantages, contingent upon your business and data requirements:

- Cost saving
- Reliable
- Mobility

AWS and DevOps

The best cloud service provider is AWS, and software development lifecycle implementation is known as DevOps.

AWS DevOps is a very popular combo for the following reasons:

- AWS CloudFormation
- AWS EC2
- AWS CloudWatch
- AWS CodePipeline

AWS CloudFormation

Compared to development teams, a DevOps team must generate and release cloud instances and services more frequently.

You can set up the full stack without having to connect anything because of the templates for AWS resources like EC2 instances, ECS containers, and S3 storage buckets.

Amazon EC2

Within EC2 instances, containers can be operated. As a result, you can use the administration and security capabilities of AWS.

CloudWatch on AWS

This monitoring tool keeps tabs on all of AWS's resources. It facilitates the usage of external monitoring tools like sumo logic, among others.

AWS CodePipeline

The code pipeline is a crucial component that makes managing your CI/CD toolkit much easier. It can be integrated with CodeDeploy, GitHub, Jenkins, and other tools that let you graphically manage the flow of app updates from build to production.

[AWS Devops Salary](#)

DevOps Tools

These are a few of the most widely used DevOps tools that are compatible with AWS.

Puppet

The most used DevOps tool is Puppet. It enables the rapid and frequent supply and distribution of technological improvements.

Versioning, automated testing, and continuous delivery are among its characteristics. It makes it possible to manage the entire infrastructure as code without growing the crew.

Ansible

Ansible is an open-source IT engine that automates various IT tools such as intraservice orchestration, cloud provisioning, and application deployment. It facilitates the scalability of automation and increases efficiency for DevOps teams.

Docker

A premium DevOps technology called Docker enables the development, deployment, and

operation of distributed applications across numerous computers. In addition, it facilitates the speedy assembly of apps from their parts and is generally appropriate for container management.

Nagios

Nagios can identify the faults and use server, network, infrastructure, and log monitoring technologies to fix them.

- It offers thorough server and desktop operating system monitoring.
- The network analyzer aids in bandwidth optimization and bottleneck identification.
- Monitoring elements, including services, apps, operating systems, and network protocols is beneficial.
- Additionally, it offers comprehensive Java Management Extension monitoring.

CHEF

A good tool for achieving consistency, speed, and scale is a chef. The chef is open-source software that runs on the cloud.

This technology develops fundamental building blocks, like recipes and cookbooks, using Ruby encoding. The chef is a tool for automating infrastructure management that helps eliminate tedious and manual duties.

Infrastructure management and automation depend on various building elements, each of which has a convention inside Chef.

Jenkins

Jenkins is a technology used in DevOps that tracks the completion of repetitive operations. Jenkins is a piece of software that facilitates ongoing integration.

On the server used for the central build, Jenkins will be installed. Identifying problems early on facilitates the more effective integration of project

adjustments.

Git

Git is a distributed version management system that is freely available to all users and is open-source. It is made to work quickly and effectively on small to large jobs. The DevOps tool serves as a vital distributed version control system.

AWS Devops Training

Conclusion

This AWS DevOps tutorial covers the basic understanding of how we can combine AWS and DevOps technology to fasten the SDLC to deliver quality applications faster. Learn everything comprehensively by enrolling in our **AWS DevOps training in Chennai.**

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