

IoT CLOUD COURSE CONTENT

Cloud Computing and Fog Computing:

Public, Private and Hybrid cloud platforms and deployment strategy.

Services of cloud:

IaaS (infrastructure-as-a-Service)

Paas (Platform-as-a-Service)

SaaS (Software-as-a-Service)

Storage, Database, Information, Process, Application, integration, Security, Management.

Cloud Carriers:

- Amazon AWS IoT
- Microsoft Azure IoT
- IBM Watson IoT Platform
- Google Cloud Platform

Cloud database Storage:

- Mysql database
- Nosql database
- Hadoop
- MongoDB

AWS cloud computing:

What is cloud computing?

-Types of clouds

-Cloud Service Models

-Architecture

AWS Account:

How to use AWS Account?

-AWS Account Identifiers

-Account Alias

-Multi Factor Authentication

-AWS Identity & Access Management (IAM)

AWS Lambda:

How to configure AWS Lambda?

- Benefits of AWS Lambda
- AWS Lambda Limits

AMAZON NETWORK SERVICES

a) AWS – Virtual Private Cloud

- How to Use Amazon VPC?
- Features of VPC
- AWS – Route 53
- How to Configure Amazon Route 53?
- Features of Route 53

b) AWS – Direct Connect

- Requirements to Use AWS Direct Connect
- How to Configure AWS Direct Connect?
- Features of Direct Connect

c) AMAZON STORAGE SERVICES

- AWS – Storage Gateway
- Volume Gateways
- Gateway-Virtual Tape Library (VTL)

d) AWS – CloudFront

- How AWS CloudFront Delivers the Content?
- Features of CloudFront
- How to Set Up AWS CloudFront?
- Test the Links

e) AWS – MACHINE LEARNING

- Types of Tasks Performed by Amazon Machine Learning
- How to Use Amazon Machine Learning?
- Features of Amazon Machine Learning.

f) Amazon AWS IoT:

- Connect and Manage Your Devices using HTTP, WebSockets and MQTT Protocols.
- Secure Device connections and data through end-end Encryption.
- Process and act upon Device Data by using services like AWS Lambda, Amazon Machine Learning etc.
- Read and set device state at any time.

AWS IoT Device Management:

Onboard, organize, monitor and remotely manage connected devices at scale.

AWS Greengrass:

It helps to run the IoT applications seamlessly across the AWS cloud and local devices using AWS Lambda and AWS IoT core.

Microsoft Azure IoT:

- a. **Windows Azure**
 - Azure as PaaS (Platform as a Service)
 - Azure as IaaS (Infrastructure as a Service)
 - Azure Management Portal
- b. **Azure – Components**
 - Compute / Execution Models
 - Data Management
 - Networking
 - Big Data and Big Compute
 - Messaging
 - Caching
 - Identity and Access
 - Mobile Service
 - Backup
 - Media
 - Commerce
 - Software Development Kit (SDK)
- c. **Storage**
 - Creating Azure Storage Account
 - Storage Account Endpoints
 - Generating an Access Key
 - Managing Data to Azure Storage..
- d. **Security**
 - Creating an Active Directory
 - Mapping a Custom Domain
 - Creating Users
 - Integrating with Azure Active Directory
 - Integrating On-Premise Active Directory
 - Reports
- e. **Management Portal**
 - Create a New Application
 - Check Credit and Subscriptions
 - Add a New Subscription
 - Azure Preview Portal
- f. **Create Virtual Network**
 - Creating a Virtual Network in Clouds Only
 - Creating a Virtual Network in Cloud Only (Advanced Settings)
- g. **Microsoft Azure Deploying Virtual Machines**
 - Quick Create
 - Create Virtual Machine with Advanced Settings
 - Connecting with a Virtual Network
 - Accessing the Virtual Machine
 - Monitoring Virtual Machines
 - Monitor VM in Azure Management Portal
 - Enable Diagnostics
 - Setting Up Alert Rules

h. Application Deployment

- Deploying a Web App from Power Shell
- Create a Deployment Package
- Create a Website in Azure using Power Shell
- Deploy Website using Deployment Package

i. Backup & Recovery

- Create Backup Vault
- Schedule a Backup

j. Self-Service Capabilities

- Group Management
- Password Management

Practical projects:

1. Python Programming on intelGalileoGen2 to analyse collected data.
2. Pushing the collected into cloud carriers.
3. Uploading data on local gateways using Wi-Fi, Bluetooth and Zigbee.
4. Uploading the data into cloud using AWS platform.
5. Remote controlling machines using cloud based apps.
6. Remote controlling machines using device based apps through cloud as intermediate node.
7. Interfacing intelGalileoGen2 with AWS IoT Gateway Services to exchange messages
8. Interfacing intelGalileoGen2 with PUBNUB clouds to understand publish/subscribe architecture and MQTT protocol.