Serverless GIS Architectures Training Course

Professional Development Training Course Outline

Category	GIS	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The landscape of Geographic Information Systems (GIS) is undergoing a significant transformation, driven by the emergence of **serverless computing**. Serverless GIS Architectures Training Course liberates organizations from the complexities of managing underlying infrastructure, enabling them to focus entirely on **geospatial data analysis**, **application development**, and delivering innovative location-based services. Serverless GIS architectures offer unparalleled **scalability**, **cost-efficiency**, and **agility**, making them a game-changer for modern geospatial workflows.

This training course will provide a comprehensive dive into designing, building, and deploying robust serverless GIS solutions. Participants will explore the core concepts of **cloud-native GIS**, leverage leading **cloud platforms** (AWS, Azure, GCP), and gain hands-on experience with serverless functions, databases, and APIs tailored for geospatial data. By the end of this program, attendees will be equipped to revolutionize their organization's geospatial capabilities, driving efficiency and unlocking new possibilities in the **geospatial intelligence** domain.

Programme Curriculum

Serverless GIS Architectures Training Course

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Course Duration

5 days

Course Objectives

This training aims to empower participants with the knowledge and skills to effectively implement Serverless GIS Architectures. Upon completion, attendees will be able to:

1. Grasp the core concepts of serverless computing, including FaaS (Functions-as-a-Service), BaaS (Backend-as-a-Service), and their applicability in GIS.
2. Design scalable and resilient GIS architectures leveraging serverless principles on major cloud platforms.
3. Develop serverless functions for common geospatial operations like geocoding, routing, and spatial analysis.
4. Utilize serverless databases (e.g., DynamoDB, Aurora Serverless) for efficient storage and retrieval of geospatial data.
5. Effectively integrate and manage third-party geospatial APIs within a serverless ecosystem.
6. Understand and apply strategies for cost optimization in serverless GIS deployments.
7. Implement robust security measures for serverless GIS applications and data.
8. Leverage serverless tools for automating routine GIS tasks and data processing pipelines.
9. Utilize Infrastructure as Code (IaC) tools (e.g., AWS SAM, Serverless Framework) for seamless deployment and management.
10. Learn to monitor performance, diagnose issues, and troubleshoot serverless GIS applications.
11. Investigate advanced serverless patterns such as event-driven architectures and microservices for complex GIS scenarios.
12. Compare and contrast serverless GIS capabilities across different cloud providers (AWS, Azure, Google Cloud).
13. Develop and deploy real-time geospatial applications using serverless technologies and streaming data.

Organizational Benefits

- Significant reduction in infrastructure costs due to the pay-per-use model, eliminating the need to provision and manage idle servers. This is particularly impactful for fluctuating geospatial workloads.
- Automatic scaling capabilities ensure that GIS applications can seamlessly handle peak loads and unexpected traffic spikes without manual intervention, guaranteeing optimal performance and availability.
- Cloud providers manage the underlying infrastructure, including patching, security updates, and maintenance, freeing up development teams to focus on innovation and core geospatial challenges.
- Faster development and deployment cycles due to simplified infrastructure management and the modular nature of serverless functions, enabling quicker delivery of new geospatial features and applications.
- Developers can rapidly experiment with new ideas and iterate on geospatial solutions without significant upfront investment or lengthy provisioning processes, fostering a culture of continuous innovation.

- Serverless platforms inherently offer high availability and disaster recovery options, distributing applications across multiple data centers, ensuring continuous operation and low latency for global users.
- Developers can concentrate on writing application logic rather than infrastructure concerns, leading to more efficient coding, easier debugging, and enhanced overall productivity.

Target Audience

1. GIS Developers.
2. GIS Architects
3. Cloud Engineers
4. Data Scientists & Analysts
5. DevOps Engineers.
6. System Administrators
7. Urban Planners & Smart City Innovators
8. Environmental Scientists & Researchers

Course Outline

Module 1: Introduction to Serverless Computing & GIS Fundamentals

- Understanding Serverless Paradigm
- GIS in the Cloud Context
- Key Cloud Provider Offerings
- Setting Up Your Cloud Environment
- **Case Study**: Analyzing how a small startup migrated their on-premise mapping service to a serverless architecture to reduce operational costs and handle unpredictable user traffic.

Module 2: Serverless Functions for Geospatial Operations

- Developing Lambda Functions (AWS)
- Azure Functions for Spatial Processing
- Google Cloud Functions for GIS Analytics.
- Function as a Service (FaaS) Best Practices
- **Case Study**: Building a serverless geocoding service that processes addresses in real-time, significantly improving the speed and cost-efficiency compared to a traditional API.

Module 3: Serverless Databases and Geospatial Data Storage

- NoSQL Databases for Geospatial Data.
- Relational Databases with Serverless Options
- Object Storage for Raster and Vector Data
- Data Partitioning and Indexing Strategies
- **Case Study**: Designing a real-time asset tracking system using DynamoDB for storing vehicle locations and Lambda functions for updating and querying.

Module 4: Building Serverless GIS APIs

- API Gateway (AWS) for Geospatial Services
- Azure API Management & Function Proxies.
- Google Cloud Endpoints & API Gateway
- Authentication and Authorization for GIS APIs

- **Case Study**: Developing a serverless routing API that calculates optimal routes based on real-time traffic data, demonstrating high concurrency and low latency.

Module 5: Event-Driven GIS Architectures

- Event Sources in Serverless GIS
- Stream Processing with Kinesis/Event Hubs
- Serverless Orchestration with Step Functions/Logic Apps:.
- Handling Asynchronous Operations
- **Case Study**: Implementing an event-driven system that automatically processes newly uploaded satellite imagery in S3, triggering image analysis functions and updating a web map.

Module 6: Deployment & Management with Infrastructure as Code (IaC)

- Introduction to IaC for Serverless GIS.
- AWS Serverless Application Model (SAM).
- Serverless Framework
- CI/CD Pipelines for Serverless GIS.
- **Case Study**: Automating the deployment of a complete serverless mapping application, including backend APIs and frontend assets, using the Serverless Framework and a CI/CD pipeline.

Module 7: Monitoring, Logging, and Troubleshooting

- Cloud Monitoring Tools.
- Logging Best Practices
- Distributed Tracing with X-Ray/Application Insights:
- Alerting and Notifications
- **Case Study**: Analyzing performance metrics and logs from a deployed serverless GIS application to identify and resolve a cold start issue impacting user experience.

Module 8: Advanced Serverless GIS Concepts & Future Trends

- Serverless GIS for Big Data Analytics
- Containerization with Serverless
- Edge Computing and Serverless GIS
- Machine Learning Integration with Serverless GIS
- **Case Study**: Exploring the use of serverless architecture to power a smart city initiative, processing real-time sensor data from IoT devices to monitor environmental conditions and traffic flow.

Training Methodology

- Instructor-Led Sessions.
- Hands-on Labs & Exercises
- Case Studies & Real-World Examples
- Demonstrations.
- Group Discussions & Q&A.
- Project-Based Learning
- Resource Sharing

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
09 Nov 2026	13 Nov 2026	Online	$1,000
09 Nov 2026	13 Nov 2026	Physical	$1,500
09 Nov 2026	13 Nov 2026	Physical	$3,000
09 Nov 2026	13 Nov 2026	Physical	$3,000
09 Nov 2026	13 Nov 2026	Physical	$6,000
09 Nov 2026	13 Nov 2026	Physical	$4,500

Start Date	End Date	Location	Price
09 Nov 2026	13 Nov 2026	Physical	$6,000
09 Nov 2026	13 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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