Advanced Linux Administration & API Integration for Telecom VAS Platforms Training Course

24 January – 4 February 2027
Nairobi

AGILE LEADERS
Training Center

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Overview

Advanced Linux Administration & API Integration for Telecom VAS Platforms Training Course is a two-week course for systems administrators, value-added service engineers, API specialists, and operations leads, who leave with a Telecom VAS Engineering and API Integration Pack. Telecom operators struggle to maintain continuous uptime and secure high-throughput messaging interfaces across complex operating system environments. The course connects Linux kernel optimization, high-availability clustering, telecom signaling interfaces, and RESTful API gateway orchestration to secure and stabilize critical value-added platforms. Agile Leaders Training Center provides this training in advanced Linux administration and API integration for telecom VAS platforms.

Who Should Attend

- Teams responsible for Linux operating system performance and kernel capacity tuning
- Functions responsible for value-added service platform uptime and carrier signaling
- Engineers responsible for telecom API integration and service broker architecture
- Teams responsible for telecommunications system hardening and access security
- Operations personnel responsible for real-time charging and billing gateway connectivity

The course assumes participants already manage enterprise Linux environments from the command line and leaves out entry-level shell syntax, basic workstation installation, and generic hardware setup.

Departments and Industries

The course serves technical teams that deploy, integrate, and maintain high-throughput service delivery platforms across connected enterprise ecosystems.

- Telecommunications value-added service and core messaging operations
- Mobile network operator digital platform and API integration units
- Financial technology and mobile payment gateway infrastructure teams
- Digital content delivery and bulk messaging service providers
- Cloud communications and platform-as-a-service technical divisions

Learning Objectives

By the end of this course, participants will be able to:

- Apply advanced Linux kernel tuning and storage parameters for telecom workloads
- Build resilient high-availability clusters using Pacemaker, Corosync, and Keepalived
- Analyze telecom signaling traffic across SMPP and Diameter Ro and Rf interfaces
- Deploy secure API gateways with OAuth2 and rate-limiting controls
- Evaluate operating system security baselines against Essential Cybersecurity Controls ECC-1:2018
- Prioritize platform incident responses through centralized audit logging and tracing

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Course Agenda

Day 1: Enterprise Linux Kernel and Storage Architecture

- Linux Kernel Subsystem Architecture and sysctl Tuning Parameters
- Logical Volume Manager Storage Pools and XFS Filesystem Optimization
- Kernel Runtime Management and Dynamic Module Loading Inspection
- Systemd Service Unit Configuration and Custom Target Management
- Resource Capacity Planning Using cgroups and Process Accounting Tools

Day 2: Advanced Networking and Traffic Optimization

- Network Namespace Isolation and Linux Bridge Configuration
- Advanced IP Routing Tables and Policy-Based Routing Rules
- TCP Socket Buffer Tuning for High-Concurrency Telecom Sessions
- Linux Netfilter Architecture and nftables Packet Filtering Framework
- Bonding and Link Aggregation Configurations for Redundant Interfaces

Day 3: High-Availability Clustering for Telecom Services

- Pacemaker Cluster Resource Manager and Corosync Messaging Engine
- Split-Brain Prevention and STONITH Fencing Agent Configuration
- Keepalived and Virtual Router Redundancy Protocol Implementation
- Shared Storage Management Using Distributed Replicated Block Devices
- Active-Passive and Active-Active High-Availability Service Failover Testing

Day 4: Telecom Signaling and Core Messaging Protocols

- Short Message Peer-to-Peer Protocol SMPP v3.4 and v5.0 Specifications
- Kannel SMS Gateway Architecture and Core Bearerbox Configuration
- Unstructured Supplementary Service Data USSD Gateway Traffic Flow
- Diameter Protocol Architecture and RFC 6733 Credit Control Applications
- Diameter Ro and Rf Online and Offline Charging Session Management

Day 5: Telecom API Standards and Service Exposure

- TM Forum Open Digital Architecture and REST-Based Open APIs
- CAMARA Project and GSMA Open Gateway Network API Standards
- SIM Swap and Number Verification Network API Implementation
- Service Activation and Customer Management API Payload Modeling
- Quality on Demand and Device Location Service Broker Integration

Day 6: Production API Gateway Engineering

- Reverse Proxy Architecture Using Nginx and Envoy Gateway Engines
- Kong API Gateway Ingress Routing and Dynamic Plugin Management
- RESTful JSON Schema Validation and Response Transformation Pipelines
- Rate Limiting and Token Bucket Throttling for Traffic Spikes
- Transport Layer Security TLS 1.3 Termination and Cipher Suite Hardening

Day 7: API Identity and Access Management

- OAuth2 Framework and JSON Web Token Authorization Flows
- OpenID Connect Identity Verification for External Service Consumers
- Mutual TLS Authentication and Public Key Infrastructure Integration
- Role-Based Access Control and Service Account Token Revocation
- Control 2-3 Identity and Access Management Verification Protocols

Day 8: Security Hardening and Regulatory Compliance

- Operating System Hardening Aligned with Essential Cybersecurity Controls ECC-1:2018
- Control 2-10 System and Information Integrity and Patch Remediation
- Control 2-11 Network Security Management and Session Boundary Controls
- Control 2-12 Application Security and External Interconnect Protection
- Data Residency Rules Under the Cloud Computing Regulatory Framework CCRF

Day 9: Telecommunications Observability and Auditing

- Auditd Subsystem Configuration for System Call Event Monitoring
- Centralized Log Shipping Using Rsyslog and Fluentd Aggregators
- Prometheus Metric Exporters for Linux OS and Platform Performance
- Grafana Dashboard Design for VAS Transaction and Latency Tracking
- End-to-End API Distributed Tracing with OpenTelemetry Standards

Day 10: Telecom VAS Engineering Practice

- Exercise: Tune Linux Kernel Network Parameters for High Concurrency
- Exercise: Build a High-Availability Pacemaker Cluster for SMPP Gateways
- Exercise: Configure an Authenticated API Gateway with Token Rate Limiting
- Exercise: Audit System Configurations Against Essential Cybersecurity Controls
- Capstone Exercise: Telecom VAS Engineering and API Integration Pack

Practical Exercises

The course uses practical activities based on realistic carrier messaging and platform integration environments.

- Suggested activity: tune Linux kernel TCP buffers, connection queues, and sysctl parameters to handle sudden messaging bursts.
- Suggested activity: deploy a two-node Pacemaker cluster with STONITH fencing to ensure zero-downtime gateway failover.
- Suggested activity: construct an Nginx API gateway enforcing OAuth2 token validation, rate limits, and TLS 1.3 encryption.
- Suggested activity: audit host system configuration files and auditd rules against Essential Cybersecurity Controls requirements.

FAQs

Who suits the advanced Linux administration and API integration course, and what does it assume?

This course suits practicing telecom systems administrators, platform engineers, and API integration architects. It assumes participants possess foundational Linux command-line skills and basic networking knowledge, focusing on enterprise clustering, carrier protocols, and API security.

How does this course differ from generic Linux certification training?

Generic Linux training focuses on general operating system administration without carrier-specific protocols. This course integrates enterprise Linux administration with specialized telecom value-added service architecture, SMPP signaling, TM Forum Open APIs, and regulatory cybersecurity controls.

Why is kernel tuning essential for telecom VAS platforms?

Kernel tuning optimizes network socket buffers, process scheduling, and connection queuing. This optimization prevents dropped packets, reduces signaling latency, and stabilizes carrier messaging gateways during sudden surges in subscriber transaction volume.

How do CAMARA and TM Forum Open APIs impact value-added services?

CAMARA and TM Forum Open APIs standardize network capability exposure through universal REST interfaces. This allows platform operators to offer capabilities like SIM verification, carrier billing, and quality on demand without custom signaling implementations.

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Conclusion

Participants return to their organizations with a completed Telecom VAS Engineering and API Integration Pack. This asset provides validated kernel configurations, high-availability clustering templates, secure API gateway architectures, and regulatory compliance audit checklists. It transforms ad-hoc server maintenance into a standardized, resilient, and secure operating environment for mission-critical telecom services.