

Application-Driven Infrastructure on OpenShift

Updated Curriculum – 8 Sessions (4 Hours Each)

Total Duration: 32 Hours

Format: Instructor-led (Remote/Onsite)

Lab Access: During training + 1 additional week

Session 1 – Kubernetes & Container Foundations (Milestone 1)

- Container fundamentals and lifecycle
- Container Runtime Interfaces (CRI)
- CNF vs VM-based workloads
- Kubernetes architecture and orchestration concepts
- Core objects: Pods, Deployments, Services
- YAML structure and purpose
- Helm charts: structure, purpose, and usage
- Tools used in Kubernetes/OpenShift environments
- Discussion Block: CNF deployment challenges in telecom environments
- Lab: Deploy and inspect a basic workload

Session 2 – OpenShift Architecture & CI/CD Integration

- What is OpenShift and where it sits in CNF architecture
- Projects, SCC, Operators, Routes
- Why use OpenShift – benefits and enterprise positioning
- CI/CD concepts and integration with OpenShift
- Lifecycle management fundamentals
- Interactive Segment: Mapping BroadForward architecture to OpenShift model

Session 3 – Translating Application Requirements into Infrastructure Language

- Functional vs non-functional requirements
- Latency, throughput, PPS analysis
- Stateful vs stateless components
- Control-plane vs data-plane separation

- Requirement documentation template
- Workshop: Create an infrastructure requirement sheet for a sample workload

Session 4 – Node, OS & Performance Foundations

- CPU architecture and NUMA awareness
- HugePages and memory locality
- RHCOS vs RHEL considerations
- Time synchronization (NTP/PTP)
- Kernel tuning fundamentals
- Lab: Inspect node topology and validate resource exposure inside pods

Session 5 – Networking Foundations (Ingress, Egress & Exposure Models)

- OpenShift networking model
- Service types and exposure patterns
- Ingress, Egress, Routes
- Load balancers and DNS
- MTU, VLAN, routing basics
- Network policy fundamentals
- Lab: Expose application via route and validate connectivity

Session 6 – Advanced Networking (Multus, SR-IOV & Multi-Network CNFs)

- Multus architecture
- NetworkAttachmentDefinitions
- SR-IOV fundamentals and VF allocation
- NUMA-aware networking
- Troubleshooting common networking misalignments
- Lab: Attach secondary interfaces and validate resource behavior

Session 7 – Security in Multi-Tenant Clusters & Storage

- Multi-tenant security implications
- SCC, RBAC, isolation challenges
- Lifecycle management in shared clusters

- Persistent vs ephemeral storage
- Storage performance considerations
- Lab: Deploy workload with controlled security constraints

Session 8 – Capstone, Validation & Deployment Readiness

- Infrastructure requirement template finalization
- Platform readiness checklist
- Deployment validation methodology
- Risk identification and mitigation
- Communication best practices with platform teams
- Capstone: Deploy using BroadForward image + YAML (subject to access availability)
- Validate compute, network, storage alignment
- Conduct structured readiness review

Participant Outcomes

- Confidently communicate technical aspects of Kubernetes/OpenShift deployments
- Translate application behavior into clear infrastructure requirements
- Identify risks in multi-tenant CNF environments
- Validate platform readiness independently
- Engage effectively with customer platform teams