BLACKBIRD FOR TRAINING

Mastering Computer Clusters: High-Performance Computing

17 – 21 May 2027
Los Angeles (USA)



Mastering Computer Clusters: High-Performance Computing

Ref: 321768_146279 **Date:** 17 – 21 May 2027 **Location:** Los Angeles (USA) **Fees:** 6600 GBP

Why This Course

High-performance computing HPC and computer clusters are the backbone of today's data-intensive and computationally demanding applications. This intensive 1-week program equips participants with the skills and knowledge to design, configure, manage, and optimize computer clusters. Through a blend of theoretical concepts and hands-on exercises, attendees gain practical experience that can be directly applied to real-world HPC environments.

What You'll Learn and Practice

By attending this course, you will be able to:

- Understand the architecture and core concepts of computer clusters and HPC systems.
- Design and configure high-performance computing environments tailored to specific workloads.
- Implement effective cluster management, monitoring, and administrative practices.
- Optimize cluster performance and troubleshoot common hardware, software, and network issues.
- Gain hands-on experience with popular clustering tools, job schedulers, and emerging technologies.



The Program Flow

Day 1: Introduction to Computer Clusters

- Fundamentals of cluster computing
- Cluster architectures and topologies
- High-performance computing HPC concepts
- Overview of clustering technologies and tools

Day 2: Cluster Design and Configuration

- Hardware selection and infrastructure planning
- Network design for HPC clusters
- Storage solutions for clustered environments
- Cluster operating systems and software stacks

Day 3: Cluster Management and Administration

- Job scheduling and resource management
- User management and access control
- Monitoring and logging cluster activities
- Backup and disaster recovery strategies



Day 4: Performance Optimization and Troubleshooting

- Cluster benchmarking and performance analysis
- Optimizing application performance on clusters
- Identifying and resolving bottlenecks
- Advanced troubleshooting techniques

Day 5: Advanced Topics and Emerging Trends

- Cloud-based clustering and hybrid HPC solutions
- Containerization and virtualization in HPC
- Running machine learning and AI workloads on clusters
- Emerging trends and future directions in cluster computing

Individual Impact

Participants will leave this course with:

- The ability to design, deploy, and manage a computer cluster.
- Skills to optimize performance for diverse HPC workloads.
- Practical troubleshooting and problem-solving capabilities for clustered environments.
- Hands-on experience with modern tools, frameworks, and technologies.

Organizational Impact

Organizations will benefit from:



- Efficiently designed and managed computing clusters that meet performance objectives.
- Improved computational throughput for data-intensive tasks.
- Reduced downtime and faster problem resolution in cluster operations.
- Enhanced readiness for integrating emerging HPC technologies and workloads.

Training Methodology

- Interactive lectures and discussions
- Hands-on labs with real cluster environments
- Scenario-based troubleshooting and problem-solving exercises
- Case studies highlighting HPC deployment best practices

Beyond the Course

By the end of this 1-week program, participants will be ready to:

- Deploy and manage high-performance clusters confidently.
- Optimize cluster resources for computational efficiency.
- Troubleshoot and resolve common cluster issues independently.
- Apply modern HPC tools and techniques to support advanced workloads.

