

Computer Cluster

Barcelona (Spain)

27 - 31 October 2025

UK Traininig

PARTNER



Computer Cluster

Code: IT28 From: 27 - 31 October 2025 City: Barcelona (Spain) Fees: 5100 Pound

Introduction

Computer clusters play a crucial role in modern computing, enabling organizations to harness the combined processing power of multiple interconnected computers. Whether it's high-performance computing, high-availability systems, or load-balancing clusters, understanding how to effectively leverage their capabilities is essential in today's technology-driven landscape.

Throughout this course, we will explore the key concepts, architectures, and software involved in building computer clusters. You will gain hands-on experience through practical exercises, learning how to optimize performance, troubleshoot common issues, and ensure fault tolerance and high availability.

Course Objectives

- Understand the fundamental concepts and principles of computer clusters.
- Learn the benefits and challenges associated with building and managing computer clusters.
- Gain hands-on experience in designing, configuring, and optimizing computer clusters.
- Develop the skills to troubleshoot and resolve common issues in computer clusters.
- Acquire knowledge of advanced topics such as load balancing, fault tolerance, and high availability in computer clusters.

Course Outlines

Day 1: Introduction to Computer Clusters

- Overview of distributed computing and parallel processing.
- Types of computer clusters: High-Performance Computing HPC clusters, High-Availability HA clusters, and Load Balancing clusters.
- Cluster hardware: Servers, networking equipment, and storage systems.
- Cluster software: Operating systems, middleware, and cluster management tools.
- Cluster architectures: Shared-memory vs. distributed-memory architectures.

Day 2: Designing and Configuring a Computer Cluster

- Cluster design considerations: Scalability, performance, and fault tolerance.
- Network topologies for clusters: Bus, ring, mesh, and tree architectures.
- Cluster interconnect technologies: Ethernet, InfiniBand, and Fibre Channel.
- Cluster storage options: Direct-attached storage DAS, Network-attached storage NAS, and Storage Area Networks SAN.

Day 3: Cluster Management and Administration



- Cluster installation and setup: Operating system installation, network configuration, and software installation.
- Cluster management tools: Job schedulers, resource managers, and monitoring systems.
- User and group management in clusters: Access control and security considerations.
- Performance monitoring and tuning in clusters: Identifying bottlenecks and optimizing resource utilization.

Day 4: Advanced Topics in Computer Clusters

- Fault tolerance and high availability in clusters: Redundancy, failover mechanisms, and data replication.
- Load balancing techniques in clusters: Round-robin, weighted round-robin, and dynamic load balancing.
- Cluster file systems: Distributed File Systems DFS and Parallel File Systems PFS.
- Virtualization in clusters: Benefits and considerations for virtualizing cluster resources.

Day 5: Troubleshooting and Performance Optimization

- Common issues and challenges in computer clusters: Network congestion, resource contention, and software compatibility.
- Debugging and troubleshooting techniques in clusters: Log analysis, performance profiling, and benchmarking.
- Performance optimization strategies in clusters: Parallelization, workload distribution, and algorithmic improvements.
- Cluster security considerations: Protecting data and resources in a shared cluster environment.



Blackbird Training Cities

Europe



Malaga (Spain)



Sarajevo (Bosnia and Herzegovina)



Oporto (Portugal)



Glasgow (Scotland)



Edinburgh (UK)



Oslo (Norway)



Anney (France)



Bordeaux (France)



Copenhagen (Denmark)



Birmingham (UK)



Lyon (France)



Moscow (Russia)



Stockholm (Sweden)
(Netherlands)



Podgorica (Montenegro)



Batumi (Georgia)



London (UK)



Istanbul (Turkey)



Amsterdam



Düsseldorf (Germany)



Paris (France)



Barcelona (Spain)



Munich (Germany)



Geneva (Switzerland)



Prague (Czech)



Vienna (Austria)



Rome (Italy)



Brussels (Belgium)



Madrid (Spain)



Berlin (Germany)



Lisbon (Portugal)



Zurich (Switzerland)



Manchester (UK)



Milan (Italy)



Blackbird Training Cities

USA & Canada



Los Angeles (USA)



Orlando, Florida (USA)



Online



Phoenix, Arizona (USA)



Houston, Texas (USA)



Boston, MA (USA)



Washington (USA)



Miami, Florida (USA)



New York City (USA)



Seattle, Washington (USA)



Washington DC (USA)



In House



Jersey, New Jersey (USA)



Toronto (Canada)

Africa



Baku (Azerbaijan)
(Thailand)



Maldives (Maldives)



Doha (Qatar)



Manila (Philippines)



Bali (Indonesia)



Bangkok



Beijing (China)



Singapore (Singapore)



Sydney (Australia)



Tokyo (Japan)



Jeddah (KSA)



Riyadh (KSA)



Dubai (UAE)



Kuala Lumpur (Malaysia)



Kuwait City (Kuwait)



Pulau Ujong (Singapore)



Jakarta (Indonesia)



Amman (Jordan)



Beirut (Lebanon)



Blackbird Training Cities

Asia



Kigali (Rwanda)



Cape Town (South Africa)



Accra (Ghana)



Lagos (Nigeria)



Marrakesh (Morocco)



Nairobi (Kenya)



Zanzibar (Tanzania)



Tangier (Morocco)



Cairo (Egypt)



Sharm El-Sheikh (Egypt)



Casablanca (Morocco)



Tunis (Tunisia)



Blackbird Training Clients



UK Training
PARTNER



Blackbird Training Categories

Management & Admin

Professional Skills
Finance, Accounting, Budgeting
Media & Public Relations
Project Management
Human Resources
Audit & Quality Assurance
Marketing, Sales, Customer Service
Secretary & Admin
Supply Chain & Logistics
Management & Leadership
Agile and Elevation

Technical Courses

Hospital Management
Public Sector
Special Workshops
Oil & Gas Engineering
Telecom Engineering
IT & IT Engineering
Health & Safety
Law and Contract Management
Customs & Safety
Aviation
C-Suite Training



BLACKBIRD
FOR TRAINING



International House 185 Tower Bridge
Road London SE1 2UF United Kingdom



+44 7401 1773 35
+44 7480 775526



Sales@blackbird-training.com



www.blackbird-training.com

UK Training

PARTNER

