

## Computer Cluster

*London (UK)*

*2 - 6 December 2024*

UK Training

# PARTNER



# Computer Cluster

Code: IT28 From: 2 - 6 December 2024 City: London (UK) 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**

