# Gigabit Ethernet Design and Troubleshooting Training Course

1 – 5 November 2027
London

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**Ref:** 1676_226016 **Date:** 1 – 5 November 2027 **Location:** London **Fees:** 5700 Euro

## Overview

Gigabit Ethernet Design and Troubleshooting Training Course is a one-week professional course for network engineers and infrastructure teams responsible for 1 Gb/s Ethernet links. Participants connect physical media, link negotiation, switching, VLANs, aggregation, redundancy, monitoring and structured fault isolation. They leave with a Gigabit Ethernet Deployment, Validation and Troubleshooting Playbook. Agile Leaders Training Center develops practical Ethernet infrastructure capability.

## Who Should Attend

- Network engineers designing and supporting switched Ethernet networks
- Infrastructure specialists responsible for copper and fibre links
- Data centre technicians installing and validating network connections
- Technical support professionals isolating connectivity and performance faults
- IT operations teams planning Fast Ethernet to Gigabit Ethernet migration

The course assumes familiarity with basic Ethernet frames, addressing and switch operation. It excludes IP routing design, wireless networking, cybersecurity operations and vendor certification preparation.

## Departments and Industries

The course supports organisations that depend on reliable switched Ethernet infrastructure.

- Enterprise information technology and network operations
- Data centres and cloud infrastructure facilities
- Telecommunications and managed network services
- Industrial, manufacturing and logistics technology teams
- Government, finance, healthcare and education networks

## Learning Objectives

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

- Develop a Gigabit Ethernet design basis and topology map
- Select 1000BASE-T, 1000BASE-SX and 1000BASE-LX links
- Design switched topologies with VLAN, trunk and aggregation requirements
- Verify auto-negotiation, speed, duplex and cabling readiness
- Baseline throughput, errors, utilisation and latency indicators
- Apply a repeatable method for fault isolation and migration

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## Course Agenda

### Day 1: Gigabit Ethernet Architecture and Design Basis

- IEEE 802.3 Ethernet Family and Applicability Map
- Ethernet Frame, MAC Address and Forwarding Review
- 1 Gb/s Link Components and End-to-End Path Map
- Bandwidth Demand and Oversubscription Assessment
- Gigabit Ethernet Design Requirements Register

### Day 2: Copper and Fibre Physical Media

- 1000BASE-T Channel and Pair Utilisation
- Copper Cabling Verification and Qualification Evidence
- 1000BASE-SX and 1000BASE-LX Link Selection
- Multimode and Single-Mode Fibre Path Review
- Transceiver, Connector and Optical Budget Checklist

### Day 3: Switching, VLANs and Link Aggregation

- Switch Forwarding and MAC Address Table Analysis
- VLAN Segmentation and IEEE 802.1Q Trunk Map
- Access and Trunk Port Configuration Evidence
- Link Aggregation Membership and Load Distribution
- Loop Prevention and Redundant Topology Review

### Day 4: Performance Validation and Fault Isolation

- Auto-Negotiation, Speed and Duplex Verification
- Interface Counters and Error Pattern Analysis
- Throughput, Utilisation, Latency and Loss Baseline
- Copper, Fibre, Transceiver and Port Fault Decision Tree
- Packet Capture and Path Evidence Checklist

### Day 5: Deployment and Migration Practice

- Exercise: Validate a 1000BASE-T Access Link
- Exercise: Review a Fibre Uplink and Optical Evidence
- Exercise: Diagnose VLAN, Trunk and Aggregation Faults
- Exercise: Compare Baseline and Degraded Performance
- Capstone: Gigabit Ethernet Deployment, Validation and Troubleshooting Playbook

## Practical Exercises

Suggested activities use enterprise access, distribution and data-centre link scenarios.

- Suggested activity: select copper or fibre media from distance and environment constraints
- Suggested activity: trace a tagged frame through access and trunk links
- Suggested activity: use counters and test evidence to isolate a degraded link
- Suggested activity: build a phased migration and acceptance checklist

## FAQs

### Who should take Gigabit Ethernet training?

Gigabit Ethernet training suits network, infrastructure and support professionals who design, deploy, verify or troubleshoot switched 1 Gb/s copper and fibre links.

### What is the difference between 1000BASE-T and fibre Gigabit Ethernet?

1000BASE-T operates over suitable balanced copper cabling, while 1000BASE-SX and 1000BASE-LX use optical fibre and transceivers. Selection depends on the required path, media, environment and link specification.

### What evidence helps troubleshoot a slow Gigabit Ethernet link?

Useful evidence includes negotiated speed and duplex, interface counters, cabling qualification, optical readings, utilisation, packet loss, latency, VLAN membership, aggregation state and packet captures.

### Does the course prepare participants for a vendor certification?

No. The course uses vendor-neutral Ethernet concepts and practical evidence. It does not follow a certification examination blueprint or replace the applicable standards and product documentation.

## Conclusion

Participants take back a Gigabit Ethernet Deployment, Validation and Troubleshooting Playbook containing media decisions, topology and VLAN maps, aggregation and redundancy checks, acceptance evidence, performance baselines and fault-isolation workflows. The playbook helps teams make link design and troubleshooting decisions consistently.