

Course : Computer cabling and new networks

Synthesis course - 2d - 14h00 - Ref. CAB

Price : 2020 CHF E.T.



Computer cabling is a crucial item in any company, due to its cost and amortization over more than 10 years. This course revisits copper and optical techniques, with illustrations based on analysis of typical technical specifications. New optical technologies will be discussed in the light of the challenges ahead.

Teaching objectives

At the end of the training, the participant will be able to:

- ✓ Understand copper and optical infrastructures for computer cabling
- ✓ Knowledge of TIA, ISO and IEEE standards for cabling components
- ✓ Test wiring with a wiring circuit scanner
- ✓ Be able to analyze a CCTP (cabling specifications)
- ✓ Understanding developments in networks and new technologies

Intended audience

Technicians and engineers involved in the design and implementation of computer cabling, but also in charge of physical network infrastructure projects.

Prerequisites

Basic knowledge of computer cabling techniques desirable.

Practical details

Demonstration

Demonstration of DSX5000 (500Mhz) cat6 and cat6A scanners with circuits from several manufacturers (permanent links and channel).

Teaching methods

A sampling of connectors will summarize the 25-year evolution of cabling. Detailed analysis of wiring specifications, example of an installer's response. Construction and measurement of a permanent circuit.

Course schedule

PARTICIPANTS

Technicians and engineers involved in the design and implementation of computer cabling, but also in charge of physical network infrastructure projects.

PREREQUISITES

Basic knowledge of computer cabling techniques desirable.

TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

ASSESSMENT TERMS

The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more.

Participants also complete a placement test before and after the course to measure the skills they've developed.

1 Developments in copper and optical networks

- An overview of the evolution of techniques and performance over a quarter century.
- Description of the various transmission media currently available (copper, fiber optics, powerline).
- Twisted copper pairs, classic optical fibers and recent developments.

2 Network characterization and architecture

- Twisted pairs: characterization and classification: categories 5, 5E, 6, 6A, 7, 7A, 8.
- U/UTP, F/FTP, SF/FTP cables... Certified de-embedded (cat5E,6), re-embedded (6A).
- Evolution of twisted pair testing: NEXT, attenuation, delay skew, return loss...
- Silica optical fibers: multimode and singlemode (OM1, OM2, OM3, OM4, OS1, OS2).
- VCSEL injectors for multimode fibers. Recent contributions from active optical cables and MPO/MTP cassettes.
- The transformation brought about by OFDM for high speeds in difficult environments (Wi-Fi, 4G, PLC, ADSL, terrestrial DTT...).

3 Standards and performance

- TIA/EIA, ISO/IEC standards for all computer cabling components.
- Upgrade to 40 Gbit (40Gbase-T) for twisted-pair Ethernet in data centers.
- New advances in optical technologies.

4 Indoor and outdoor, local, campus and metropolitan deployments

- Indoor and outdoor fiber optics (campus networks, operator networks).

5 New networks

- Powerline carriers (IEEE P1901). Complement to copper and optical LANs.
- Preferred targets: hotels, conferences, hospitals, museums (surveillance cameras, music and remote screens).
- New fiber types: FMF (mode-restricted), MCF (multi-core) to increase single-mode throughput.
- For new applications: HCF fibers (hollow cores), microstructured fibers, band-gap fibers.

TEACHING AIDS AND TECHNICAL RESOURCES

- The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
- At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
- A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@orsys.fr to review your request and its feasibility.