

Fibre-to-the-Home (FTTH) Network Planning and Optimisation

25 – 29 August 2014,
Port Louis, Mauritius



COMMONWEALTH
TELECOMMUNICATIONS
ORGANISATION

Overview

Next generation networks require state-of-the-art access facilities to deliver High Speed Internet, Voice, multimedia services and IPTV. Most of these require large access bandwidth most likely to be delivered over next (?) generation wireless or fibre. There are many new options for loop and access aggregation network design, especially utilizing fibre access technology.

This course examines the new fibre technologies now available, considers the advantages of each fibre access structure and provides an understanding of how a Next Generation Access network can take advantage of Ethernet over fibre.

Organised under



For more information
about this course, or to
register, contact us on:
Tel: +44 (0) 208 600 3800
Fax: +44 (0) 208 600 3819
Email: programmes@cto.int

OBJECTIVES

- Describe the different fibre optic technologies available for Next Generation loops
- Consider in detail the advantages of each technology
- Consider the sizing and design of an next generation network access and aggregation network
- Select the appropriate ethernet technology standards for deployment

TARGET AUDIENCE

Telecom engineers, senior, technical staff involved in core and access network planning, implementation, and management and maintenance

EXPECTED OUTCOMES

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

- Describe the underlying principles and concepts of local access technologies using optical fibre
- Identify concepts of data transmission over fibre, improvements and limitations
- Determine optical networking elements and solutions
- Discuss the relationship between copper and fibre access loops

OUTLINE

The following topics will be covered.

Module 1: Introduction to FTTH

- Next Generation Network
- Functions and access requirements
- Loop requirements
- Application requirements
- Backhaul
- Next generation applications
- FTTH access technologies

Module 2: Fibre Optic Technology Options

- Fibre optics subsystems
 - ◊ Fibre to the Home (FTTH), Fibre to the Antenna (FTTA), Fibre to the Premise (FTTP), Fibre to the Curb (FTTC)
- Multi-mode and single mode fibre engineering
- Transmitters and Receivers
- Wavelength considerations:
 - Wavelength Division Multiplexing (WDM)
 - Dense Wavelength Division Multiplexing (DWDM)
 - Course Wavelength Division Multiplexing (CWDM)
- Difference between Passive and Active Optical Equipment
- Network testing with Optical time-domain Reflectometer (OTDR) test sets
- PON Components
 - ◊ Fibre configurations
 - ◊ Splitters
 - ◊ Connectors
 - ◊ Splices
 - ◊ Indoor Multi-dwelling Unit Equipment
- ITU-T G.984 standard
- ATM Passive Optical Networks (APON)
- Broadband Passive Optical Networks (BPON)
- Gigabit capable Passive Optical Networks (GPON)
- Ethernet Passive Optical Networks (EPON)
- Transition from Synchronous Optical Networking/ Synchronous Digital Hierarchy (SONET/SDH) to Ethernet based systems
- Carrier Ethernet-Based Converged Services Infrastructure

Module 4: Ethernet in the First Mile and the Backhaul

- Institute of Electrical and Electronics Engineers (IEEE) 802.3 options
- Optical Ethernet Options
- Ethernet in the first mile
- 1000BASE-LX, 1000BASE-SX
- 10GBASE-SR, 10GBASE-LX4, 10GBASE-ER
- 10GBASE-LR, 10GBASE-SW, 10GBASE-LW, 10GBASE-EW
 - ◇ IEEE 802.1Q VLANs (Institute of Electrical and Electronics Engineers)
 - ◇ Q-in-Q and MAC-in-MAC
 - ◇ OLT Port Optimization (Optical Line Terminal)

Module 5: Key Physical Parameters Affecting Network Performance

- Capacity planning workshop
- Loss budget
- What can affect the loss budget?
 - ◇ Bad connections
 - ◇ Other effects
 - ◇ Macrobends
- OTDR based techniques in fibre access network
- Need for an effective Network Management System
- Aggregation and protection Options
 - ◇ Aggregation options
 - ◇ Building aggregated backhauls
 - ◇ Rapid Packet Ring (RPR)

FACULTY

Faculty

Karl Hentschel, MBA, B Eng

Karl Hentschel holds a BEng (Bachelor in Electronic Engineering) obtained at the Ingenieur Hochschule, Karl-Marx Stadt, Sachsen-Anhalt, DDR Germany and an MBA (Betriebswirtschafts Verwaltung) from the Bundeswehrfachschule, Nienburg/Weser, BRD Germany. The accumulated knowledge was augmented with deep dive training in project management, risk mitigation, business continuity, marketing concepts and other relevant topics throughout his career.

From 1968 to 1990 Karl held a number of senior line and staff positions in the areas of regulatory relations, network operations, planning and expansion, customer service, marketing, training and product development at AT&T Canada. He was a senior member of the team supporting long distance competition in Canada responsible for developing the operational plan and the underlying budgets. He worked closely with regulatory staff at the CRTC in Canada and with the FCC in the US on cross border services and facilities.

In his consulting practice, Karl conducts training courses and workshops globally ranging from competitive marketing strategies in Saudi Arabia to detailed technology topics in both fixed wireline and wireless network environments in several Commonwealth countries. His courses on risk mitigation and business continuity are especially well received. Karl brings actual carrier experience to his training and workshops. His training evaluation forms score consistently in the high range.

Please fill in this application form and fax it back to +44 20 8600 3819 or return it to the CTO at the e-mail address below. Please use CAPITAL LETTERS.

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2) Payment mode (choose one option only)

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Additional information

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Your area of work in the organisation

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- Customer service and care
- Engineering and technical management
- Financial, purchasing & investor relations
- IT / IP management
- Marketing and sales
- Public relations and corporate communications
- Regulatory and legal affairs
- Telecoms network management
- Human resources
- Other

Your organisation type

- Government
- Regulator
- Operator
- Manufacturer
- Other

Your organisation's service areas

- Fixed network / services
- Mobile / wireless network / services
- Satellite network / services
- Internet
- Broadcasting
- Value-added services
- Support
- Other services


REGISTRATION DEADLINE

Prior to course start.

3 SIMPLE WAYS TO REGISTER

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 Call the programme team at +44 20 8600 3800

 E-mail the programme team at programmes@cto.int, quoting the course title.

NEED HELP?

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