

# Broadband Technologies and Multimedia Services

20 - 24 October 2014

Trinidad and Tobago



COMMONWEALTH  
TELECOMMUNICATIONS  
ORGANISATION

## Overview

This course is designed to introduce the participants to:

- Different broadband technologies (both wired and wireless) available for today's Communications Service Provider (CSP) business requirements
- Understand importance of different technologies
- Select the best technologies that fit their requirements

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](mailto:programmes@cto.int)

## OBJECTIVES

To be delivered over five days, the course aims to:

- Explain the basic data transmission concepts
- Explain the ISO/OSI (TCP/IP) stack and the operation
- Explain the different broadband technology options available
- Explain how to select the correct and best broadband technology for a given scenario
- Explain the different applications delivered over broadband networks

## TARGET AUDIENCE

This course is aimed at technical staff involved in considering, evaluating, selecting and rolling out broadband networks. This course will also be suitable for Network Planners, policy and regulatory bodies and telecom operators who want to understand how best to utilise the capabilities of broadband.

## EXPECTED OUTCOMES

On completion of this course, the successful participant will be able to:

- Understand the basic data transmission concepts
- Understand the ISO/OSI (TCP/IP) stack and the operation
- Understand the different broadband technology options available
- Learn how to select the most appropriate broadband technology to match the needs and requirements of your organisation.
- Explain the different applications delivered over broadband networks

## OUTLINE

### Explain the basic data transmission concepts

- Basic Building Blocks of Communication Technologies
  1. Core, aggregation and access networks
  2. Types of networks: Fixed (or wire-line) and mobile (or wireless) networks
  3. Circuit-switched and packet-switched networks
- Evolution of data communication technologies networks
  1. Analogue to digital
  2. TDM to IP

### Explain the ISO/OSI (TCP/IP) stack and the operation

- Introduction to Internet protocol
  - ISO/OSI and TCP/IP stack and protocols
    1. Physical layer
    2. Data link layer
    3. Network layer
    4. Transport layer
    5. Session layer
    6. Presentation layer
    7. application layer
    8. comparison of ISO/OSI and TCP/IP stacks
- IP versions
  - IPv4
  - IPv6
  - IP addressing
    1. Private
    2. Public
    3. Classes
    4. Sub-netting
    5. Super-netting
- Routing and switching
  - Routing protocols
    1. RIP
    2. IGRP
    3. OSPF
    4. BGP
- Standard related to IP
  - IETF RFCs

### Explain the different broadband technology options available

- Wireless
  - Mobile
    - 3G
      - UMTS
      - HSDPA/HSUPA
    - 4G
      - LTE
    - Fixed
      - LTE
      - WiMAX
      - WiFi



- Wired
  - Copper
    - ADSL/2/2+
    - VDSL/2
  - Fibre
    - AON
    - PON
- Standard related to different broadband technologies
  - ITU-T
  - IEEE
  - BB forum
- Overview and introduction to Ethernet
  - History of Ethernet
  - Basic Ethernet operation
  - Using Ethernet
    - LAN
    - WAN
    - MAN
  - Carrier/Metro Ethernet
  - MEF

## Explain how to select the correct and best broadband technology for a given scenario

- Designing wireline broadband networks
  - Access network life cycle
    - 1.Strategy and architecture
    - 2.Planning and design
    - 3.Project and implementation
    - 4.Operation and maintenance
  - Selecting the correct broadband strategy
  - Bandwidth consideration and optimization

## Explain the different applications delivered over broadband networks and other things to consider

- IP based applications
  1. Data
  2. Video
  3. Voice
- Network security
- Management
- QoS

## FACULTY

### Anuradha Udunuwara

Anuradha Udunuwara holds over a decade of experience in the Communications Service Provider (CSP) Networks in various aspects such as strategy, architecture, engineering, design, plan, implementation and maintenance using both Packet-Switched (PS) and Circuit-Switched (CS) technologies (IP/MPLS, Ethernet, FR, OTN, xWDM, PDH, SDH, xDSL, GPON and WiFi), along with legacy to NGN migration.

He graduated from University of Peradeniya, Sri Lanka with BSc.Eng (Hons) in Electrical & Electronic Engineering and gained the Chartered Engineer status from Institution of Engineers, Sri Lanka in 2008. Anuradha also holds many professional certifications including MEF Carrier Ethernet Certified Professional (MEF-CECP) and ITILv3 Foundation,

Anuradha joined Sri Lanka Telecom as an Engineer in June 2003 and has served in various capacities as Engineer / Data Services Maintenance, Engineer / Data Services Networks and Engineer / Metro Ethernet & FTTx Network Planning to achieve many significant milestones. Currently he holds the post of Engineer / Sales-Region I where he is responsible for consulting, advising, architecting, designing & planning technical solutions for Small & Medium Enterprise/Business/Industry (SME/B/I) customers. In addition, he is also involved in xWDM/OTN Backbone Networks, FTTH and WiFi implementations. His teaching experience extend to the level of guest lecturer at Department of Electrical & Electronic Engineering, Faculty of Engineering, University of Peradeniya, Sri Lanka where he conducts a short course on CSP industry to final year Electrical & Electronic Engineering undergraduates.

He has published a paper (co-authored) "Evolving Operator Network Architectures with Carrier Ethernet" in the Ethernet Academy in 2013 and has also act as a speaker and panelist at Carrier Ethernet APAC, Singapore 2013 and WDM & Next Generation Optical Networking APAC, Singapore 2014. In addition, Anuradha holds membership of various professional bodies: Member of The Institution of Electrical & Electronic Engineers (MIEEE), Member of The Institution of Engineering & Technology (MIET), Member of The British Computer Society (MBCS), Member of The Institution of Engineers Sri Lanka (MIESL), Member of The Internet Society (ISOC), Member of The Computer Society of Sri Lanka (MCSL) and Life Member of The Sri Lanka Association of the Advancement of Science (MSLAAS) are few.

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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.

## Personal details

Mr/Mrs/Ms/Other ..... First name ..... Last name .....

Job title .....

Organisation .....

Address .....

City ..... Postcode ..... Country .....

Tel ..... Mobile ..... Fax .....

Email .....

Authorising line manager's name .....

Authorising line manager's email .....

## Payment options

1) Select Delegate Rate (Please Refer to the list of CTO/PDT Partners provided overleaf)

	Standard Rate	Early Registration by: 20 September 2014
CTO Members	<input type="checkbox"/> £799	<input type="checkbox"/> £749
Others	<input type="checkbox"/> £1,199	<input type="checkbox"/> £1,149

2) Payment mode (choose one option only)

☐ Invoice

Invoice me at the above address (Discounts do not apply, payment must be received by us prior to event).

☐ Cheque

Cheque enclosed, payable to "CTO HQ"

☐ Bank transfer

Make payments to: Coutts & Co.  
440 Strand, London, WC2R 0QS, UK  
A/C Name: CTO; A/C Number 083675071  
Bank Sort Code :18-00-02  
SWIFT Code: COUT GB22  
IBAN Reference: GB72COUT18000208367507

☐ Credit Card: Visa / Mastercard (delete as appropriate)

Card holder's name .....

Card holder's billing address (if different from above) .....

Card number

Valid from  /  /  Expiry date  /  /  3 digit security code on back of card

## Signature

Date ..... Name ..... Signature .....

## Additional information

To help us improve our services to you and your organisation, please tell us more about yourself and your organisation.

### Your role in the organisation

- ☐ Strategic / executive  
☐ Planning  
☐ Control  
☐ Operational

### Your area of work in the organisation

- |   |  |
|---|--|
| <input type="checkbox"/> Business development                       | <input type="checkbox"/> Marketing and sales                           |
| <input type="checkbox"/> Corporate affairs                          | <input type="checkbox"/> Public relations and corporate communications |
| <input type="checkbox"/> Customer service and care                  | <input type="checkbox"/> Regulatory and legal affairs                  |
| <input type="checkbox"/> Engineering and technical management       | <input type="checkbox"/> Telecoms network management                   |
| <input type="checkbox"/> Financial, purchasing & investor relations | <input type="checkbox"/> Human resources                               |
| <input type="checkbox"/> IT / IP management                         | <input type="checkbox"/> Other   |

### Your organisation type

- ☐ Government  
☐ Regulator  
☐ Operator  
☐ Manufacturer  
☐ Other

### Your organisation's service areas

- |   |   |
|---|---|
| <input type="checkbox"/> Fixed network / services             | <input type="checkbox"/> Broadcasting         |
| <input type="checkbox"/> Mobile / wireless network / services | <input type="checkbox"/> Value-added services |
| <input type="checkbox"/> Satellite network / services         | <input type="checkbox"/> Support              |
| <input type="checkbox"/> Internet                             | <input type="checkbox"/> Other services       |


## REGISTRATION DEADLINE

Prior to course start.

## 3 SIMPLE WAYS TO REGISTER

 Fill in and fax this form back to +44 20 8600 3819

 Call the programme team at +44 20 8600 3800

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

## NEED HELP?

Call us now on +44 20 8600 3800  
or e-mail the programme team at programmes@cto.int

## Summary Terms and Conditions

The CTO will endeavour, as can be reasonably expected, to ensure that the course is delivered to meet delegates' expectations. Registration is subject to availability and payment received by the deadline where specified for each course. Dates may be subject to changes. Travel, accommodation, daily transportation to venue, subsistence and other costs are the sole responsibility of the delegate and are not included in the above fees. Applicants are responsible for their visa arrangements and other formalities wherever required. Course bookings may be cancelled at the discretion of the CTO or its partners. Applicants paying by bank transfer are responsible for bank charges and any other such costs and should ensure the exact amount in GBP Sterling is credited in the CTO bank account. Applicants requiring additional information prior to their booking should ensure they provide sufficient time before the booking deadline. Cancellation rules apply, as summarised below. For a full version of our Ethical Framework or our Terms and Conditions, please visit our website at [www.cto.int](http://www.cto.int).

## Cancellations / Refunds

For delegate cancellations/withdrawals, the following refund rules apply:

- 31 days or more prior to event: the full amount less a handling charge of 10% or a minimum of £55, whichever applies
- 30 days or less prior to event: no refund

For CTO cancellations/withdrawals, delegates are entitled to a 100% refund within 60 days of the withdrawal/cancellation. Refunds will be made by bank transfer only.

## Data Protection / Privacy

The CTO does not sell, rent or lease its customer information to third parties. We may, from time to time, contact you on behalf of a third party/partner about a particular offering that may be of interest to you. In those cases, your unique personally identifiable information (email, name, address, telephone number) is not transferred to the third party/partner. In addition, we may share your information with trusted partners to help us perform statistical analyses, send you by e-mail or postal mail, provide customer support, or arrange for deliveries or other such services. All such third parties are prohibited from using your personal information except to provide these services to the CTO and they are required to maintain the confidentiality of your information. For more information about our privacy policy, visit our website at

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