

# IP Networks Design and Applications

26 - 30 October 2009  
Honiara, Solomon Islands



COMMONWEALTH  
TELECOMMUNICATIONS  
ORGANISATION

[www.cto.int](http://www.cto.int)

Register by  
11th September 2009  
for a 10% discount!



## Overview

The Internet Protocol (IP) has been the backbone of the Internet since its inception and now with the evolution to all-IP centred networks and systems, it is fundamental to the development and deployment of new generation telecommunications and ICT infrastructures and services.

Some fundamental IP considerations are:

- IP fundamentally "flattens" systems design creating efficiencies in the deployment of existing and new services alike.
- IP has become the one single protocol through which converged solutions for voice, data and multimedia are deployed.
- The success of IP has led to the likely depletion of address space, forcing the development of a next generation IPv6 protocol, with enhancements to support the next generation of networks and application services

For more programmes and courses run by the PDT contact us at:  
Tel: +44 (0) 208 600 3800 Fax: +44 (0) 208 600 3819 Email: [programmes@cto.int](mailto:programmes@cto.int)



## Learning outcomes

On course completion, participants will have:

- Acquired a broad understanding of the IP protocol suite
- Explored the different types of IP services and its relevance
- Understood the implications of the evolution to an all IP network
- Acquired a broad understanding of IP network design concepts
- Explored concepts around IP & security
- Understood various IP applications in modern technologies including VoIP and wireless networks
- Gained a broad understanding of IPv6 and implications for migration and future networks

## Key objectives

- Give an understanding of the nature of the TCP/IP protocol
- Explain the IP protocol suite, its applications and implications on the management of IP-based systems
- Guidance in the use of the IP protocol in the design of secure and resilient networks
- Explore the applications, issues and solutions with deploying IP for wired and wireless services.
- Provide an introduction to the next generation IP Protocol (IPv6) and explore migration

## Who should attend

The course is of relevance to those involved in planning, deploying, developing and supporting IP based networks and services such as:

- Telecom engineers and technicians
- Telecom professionals moving into technical management positions
- Telecom and IT infrastructure managers and project managers
- Telecom or IT professionals interested in evolution to all-IP networks

## Learning environment

The teaching will allow for interactive, cross-learning opportunities involving working in teams, class exercises and problem solving, and practical activities using a small set of equipment including desktop computers

## Pre-requisites

The course is open to people with no prior knowledge of IP and IP network design but a basic understanding of networking and operating a Windows computer would be essential.

## Course content

### Introduction

- Networks and protocols
- Development of TCP/IP
- TCP/IP features and standards
- Protocol layers and the OSI Model
- TCP/IP protocol suite and Comparison with OSI model

### TCP/IP protocol suite

- **Network Access layer**
  - Hardware and protocols
  - Network Architecture
  - Physical addressing
- **The Internet layer**
  - Addressing and delivery
  - The Internet protocol (IP)
  - Address resolution protocol (ARP) and Reverse ARP
- **Subnetting and CIDR**
  - Subnetting and Network division
  - Working with subnets
  - CIDR
- **The Transport layer**
  - TCP and UDP
  - Ports
  - Firewalls
- **Application Layer**
  - Network services
  - Communication within Application layer (APIs)
  - IP Utilities

### TCP/IP Networking

- **Connectivity infrastructure**
  - Dial-up
  - Cable broadband
  - DSL
  - Wide area networks
  - Satellite networks
  - Wireless networking
  - Mobile data
  - Connectivity devices
- **Routing**
  - Routers and routing overview
  - Routing protocols
  - Classless routing
- **Firewalls**
  - Firewall options
  - Firewalls rules
  - DMZ
  - Proxies
- **Name resolutions**
  - Host Files
  - DNS
  - Domain registration
  - NetBIOS
  - Dynamic DNS

## Course content

### Internetwork Design

- Connectivity
- Addressing and naming considerations
- Host Configuration (DHCP)
- Network Address Translation (NAT)
- Network Performance considerations

### Network Management and Troubleshooting

- Connectivity management
- Bandwidth management
- Performance management
- File transfer and remote copy
- Security management

### IP Security

- Security Issues
- Securing TCP/IP
- Security technologies and services
- Security management

### IP applications

- **IP and the Internet**
  - The World Wide Web (WWW)
  - URL and URI
  - HTML and HTTP
  - Content and Content filtering
  - Email and email formats
  - Webmail
  - Email protocols
  - Spam and mail filtering
- **Streaming and Multimedia services**
  - Streaming problems
  - Quality of Service (QoS)
  - Voice over IP (VoIP)
  - SIP and Evolution to all IP Networks
  - RTP
- **Web services and the New web**
  - Ecommerce
  - Instant messenger
  - Peer-to-Peer
  - Social networking
  - Blogging

### IP Convergence in Modern Networks

- **IP Convergence**
- **Mobile IP**
  - Mobile data services
  - Mobile Multimedia services

### Overview of IPv6

- Need for New IP version
- IPv6 Addressing
- IPv6 coexistence with IPv4
- IPv6 with Quality of service

Course programme may change due to late requests from other registered participants

## Course leader



Dr Forba A. Ngemoh - PhD, BEng.

Dr. Ngemoh has over 20 years of experience in technical infrastructure management, solution design, implementation and support. he has held the position of head of technical strategy for an IT shared services venture between three major UK not-for-profit organisations. Dr. Ngemoh has also successfully

managed the specification, design and delivery of numerous IP based WAN infrastructure and solutions, including cable and satellite broadband, MPLS, GPRS, VoIP and VPN based networks for clients in the UK and Africa.

He holds a PhD and BEng in engineering from Kings College, University of London, and provides regular training to staff and presentations to senior managers.

Hosted by:

**Solomon Telekom**

In partnership with:

**Telecommunications Regulatory Board of Cameroon**

## About the CTO

The Commonwealth Telecommunications Organisation (CTO) is an international development partnership between Commonwealth and non-Commonwealth governments, business and civil society organisations.

It provides the international community with effective means to help bridge the digital divide and achieve social and economic development through the use of Information and Communication Technologies (ICT) in the specific areas of Telecommunications, IT, Broadcasting and the Internet.

## About the programme for development and training (PDT)

Managed by the CTO, the PDT is a unique low-cost membership programme providing needs-based professional training and capacity building courses on telecommunications policy, regulation, technologies and telecoms business management.

The PDT has delivered over 3600 bilateral training and consultancy projects, covering every aspect of the telecommunications industry, training over 35,000 professionals in 33 countries of the Commonwealth.

For more programmes  
and courses run by  
the PDT contact us at:

Tel: +44 (0) 208 600 3800  
Fax: +44 (0) 208 600 3819  
Email: [programmes@cto.int](mailto:programmes@cto.int)

See more information  
on our website

[www.cto.int](http://www.cto.int)

