# LAN and WAN Technologies for Mitel Voice over IP

## Course Objectives

This LAN and WAN Technologies course will give delegates a good understanding of LANs, WANs and Voice over IP.

It is aimed at those who want to move into the world of VoIP and require a solid foundation before attending a Mitel 3300 ICP training course.  It can also be taken as a standalone course.

Being a modular training course, delegates can work through all modules or simply choose the module they really need.

Each module has it's own 'mini' quiz at the end to help delegates 'gauge' how well they are doing and the 'Final' Accreditation test is available on Mitel Online.  Passing the test on MOL will add the result to your Mitel profile.  There is also a test available on this website for a Vocale accreditation.

The Modules are as follows

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| **What is Voice over IP?** | This is an introduction module that sets out the scope of the course and introduces the concepts of LANs and WANs. |
| **Networking Components** | This module is designed to introduce you to Data networks and how devices connect to them.  It does this by describing the most commonly used topologies and cabling types in use today. |
| **Ethernet** | Ethernet is the predominant force in networking today and this module introduces all of the concepts needed to understand this specification along with introducing basic network components like LAN cards and LAN switches. |
| **The OSI Model** | The OSI Model was designed to break networking components and software into 'bite-size' interoperable chunks.  This module explains the 7 layers of the OSI model and compares them to the real world implementation of the TCP/IP layered model. |
| **WANS** | Wide Area Networks connect buildings, homes and people together.  This module aims to explain what a WAN is and how they work along with explaining some WAN protocols such as PPP, ADSL and Frame Relay. |

**TCP/IP Networks**

This module explains how TCP/IP networks work by describing the functionality of each TCP/IP layer. By understanding these layers you will understand how a TCP/IP network works which will give you a good understanding of how voice can be carried across an IP network.

**TCP/IP Addresses**

IP Addresses, Subnet Masks, Default Gateways. It's all here and delivered to you in a way so that you will understand what these numbers are for and how they work with each other.

**DHCP**

This Module introduces the Dynamic Configuration protocol (DHCP) and describes what it is, how it works and how it works in a multi-network environment along with introducing some troubleshooting commands.

**Troubleshooting**

Follow the tips in this module and you will be able to solve the majority of problems you will encounter on a Network.

**LAN Monitoring**

This module teaches you how to use a Network monitoring program to analyse traffic on the network in order to help troubleshoot even the trickiest problems..

**SNMP**

SNMP is a great tool for monitoring network components and getting error information from the components when things go wrong. This module explains how SNMP works along with information on Managers, Agents, Traps, MIBS and more.

**Switches and VLANS**

This module explains the fundamental operation of a LAN switch along with the important concepts of Virtual LANs (VLANS).

**Routing**

Routers are used on the edge of networks to pass data onto a WAN and within Layer 3 LAN switches. This module describes how routers work along with a brief explanation of Routing protocols such as RIP, IGRP and EIGRP.

**Wireless**

Wireless is one of the fastest moving areas in the world of networking. This module explains the basics of Wireless networking along with information on securing your wireless network.

**IP Applications and Services**

So many other services can be found on a network and some, if not all, will have an impact on how your voice will work. This modules looks at services such as FTP, TFTP, Firewalls, NAT, Proxy Server, DNS and VPNS.

**VoIP**

This module introduces the different implementations of Voice over IP and describes the basics of codecs, signalling, the real

time protocol (RTP), quality of service (QoS) and the basics of network design to reduce delay and jitter that can affect the quality of voice on a network.

**Hosted VoIP**

Hosted voice over IP is a new way of delivering top quality telephone solutions to customers at very low cost.  This module is designed to be an introduction to hosted voice over IP with emphasis on the Mitel 3600