

# Fundamentals Of TCP/IP Networking

## Layering, Networking Architecture, Addressing, IPv4&IPv6, TCP, UDP, DNS, DHCP, HTTP, Security

TCP/IP is the dominant networking protocol suite and all involved in delivering modern technology solutions need a clear understanding of how it fundamentally works. Developers, devops and system admins, along with many specialists (such as those involved in database and security) could all benefit from attending this course as it will clarify the fundamentals of networking with the TCP/IP suite.

Networking touches on development, security, network traffic, identity, messaging, data transfer, resilience, middleware and lots more.

We examine the entire set of protocols in the TCP/IP suite. Even though the suite name mentions just two protocols, it is actually a much larger collection of protocols, with important protocols above and below the TCP and IPv4/IPv6 protocols.

In any modern OS, its networking stack is a large segment of the codebase and exposed API. By investigating what is actually happening between one app sending & another app receiving a message (by examining net traffic using appropriate monitoring tools), we can expand our understanding significantly.

<b>Contents of One-Day Training Course</b>	
<p><b>Target Audience</b> Everyone with a technical background who is interested in how computer networks actually work.</p> <p><b>Prerequisites</b> Experience of working on software projects, including development, deployment and ongoing service provision.</p> <p>No previous network programming or infrastructure experience is required, though any such knowledge would be beneficial.</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><b>Layers, Protocols and Devices</b> Overview of networking participants Networking big picture Organization of the Internet Protocol development process (RFCs)</p> <p><b>Use of Wireshark</b> Eavesdropping on the network Extremely useful tool for low-level monitoring of protocol traffic</p> <p><b>TCP/IP Family Of Protocols</b> Layering of protocols Distribution of responsibilities Packet structure (encapsulation etc.)</p> <p><b>Data Link and Network Links</b> How octets are physically communicated technologies used at data and network Ethernet</p> <p><b>Addressing</b> Approaches to network addressing Subnetting ARP Addressing for IPv6</p> <p><b>IPv4 &amp; IPv6</b> Protocol exchanges Packet structures MTU Internet Control Message Protocol (ping)</p> <p><b>TCP</b> Enhanced services Headers Windowing SYN packet and triple-handshake Protocol exchanges</p> </div> <div style="width: 48%;"> <p><b>UDP</b> Comparison with TCP “Best effort” datagram service Protocol exchanges</p> <p><b>DNS and DHCP</b> DNS architecture DNS headers Record types (e.g. SRV records) DHCP architecture</p> <p><b>Internet Building Blocks</b> Routing protocols Border Gateway Protocol (BGP) QoS AS</p> <p><b>HTTP 1.x &amp; 2</b> HTTP basic messaging patterns Using Fiddler to examine HTTP traffic Message chunking Multiple concurrent channels in HTTP/2</p> <p><b>SMTP, POP and MIME</b> Email protocols family Message stores Representing emails</p> <p><b>Security And Networking</b> Firewalls NATs IPSec SSL/TLS</p> <p><b>OS Networking Stacks</b> Windows Linux Exposed C APIs (sockets etc.) Networking APIs inside managed runtimes</p> </div> </div>