



**Gwani Software**



**TRAINING DEPARTMENT**  
***(Knowledge & Expertise)***

**Networking Fundamentals Curriculum**

**December 2011**

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equivalent to

1/12/2011.

## Gwani Software

### TRAINING DEPARTMENT

#### **Networking Fundamentals**

**General Description:** - This course is intended to give the trainee the basics of Wired and Wireless Networking practice.

**Aims:** - The aims of this course are:

1. To give trainee practical knowledge of planning, designing and implementation of data network.
2. To avail trainee with the common Network Operating System and how to install them.
3. To drill trainee on networking standards and norms.
4. To introduce the common networking tools and accessories to the trainee.
5. To create the trainees awareness on network security.

**Objectives:** - The trainee at the end of the training session should be able to:

- Know how to identify the basic networking devices, components and tools.
- Know how to design workgroup on peer-peer network.
- Know how to design workgroup using switch or hub.
- Know how to install cables and connectors on Sotito networks.
- Know how to design and implement an ad-hoc network.
- Know how to crimp cross over cables, straight through cables and pinging a node.
- Know how to design a client server network.

**Target Audience:** - This course should be taken by Network Administrator, Network Engineers, Computer Scientist and Network Technicians.

**Pre-requisite:-** Desktop maintenance & Repair is a standing Pre-requisite to this course.

**Approximate Duration:** - The course requires Five weeks of class session with practicals.

**Method of Assessment:** - The trainee is to be assessed with practical assessment and examination on lessons covered.

**Methodology:** - The class takes a lesson discusses it, then sees how it can be applied in networking practice. After lessons for the week have been discussed, the trainee will be given a hand on deck assessment on networking practices. At the end of the training session the trainee will be required to configure a DHCP server on a client-server network as a final assessment.

### **Recommended Resource Materials:-**

The following materials are recommended for the trainees Study.

1. Home networking.
2. Sue Plumley, (2004), '**Home Networking Bible**', Wiley publishing Inc. Indianapolis.
3. George U, (2006), '**IP subnetting made easy**', Tech republic.
4. Ravi Malhotra, (2002) '**IP Routing**', O'Reilly,
5. Networking 107
6. Peter B, Kennington, (2005) '**RF and baseband Techniques for software defined Radio**', Artech house, Boston.
7. Subnetting examples
8. Peter Thermos, Ari Takanen, (2008) '**Securing VoIP Networks threats, vulnerabilities and counter measures**', pearson education Inc, Boston.
9. David Barnett, David Groth, Jim McBee, (2004), '**Cabling: Complete guide to network wiring 3<sup>rd</sup> Edition**', Sybex Inc, Alameda.
10. Troubleshooting Internetworking systems
11. Robert Breyer, Sean Riley, (1996), '**Switched and fast Ethernet**', Ziff Davis Press.
12. Jean-Philippe Muller,(2002), '**Wireless LAN: techniques RF, Wi-Fi, Bluetooth**'.

Unit	Content
<i>Week One</i> <i>Introduction to components &amp; tools</i>	
1	<b>Components:</b> NIC, Rj 45 jack, RJ II jack, UTP cable, trunking pipes, joints, hub, switch, repeaters, Modem, wireless NIC, wireless adapter, wireless switch, Bluetooth, infer red detectors, other infer red devices, router, gateway, RJ 45 cap, faceplate & others.
2	<b>Tools:</b> Crimping tool, T586 A standard, T586 B standard, crimping of straight through and cross over cables, Punch down tool and how to use it. LAN tester and using it for testing work.
3	<b>Accessories:</b> pinging in windows 9C or its simulation, pinging in windows XP and Vista, pinging in Mac OS or its simulation, pinging in Linux (Red Hat or Fedora) or its simulation. Display of IP address, common network operating systems (Red Hat server, windows server 2003 or 2007, Novel, windows NT).
<b>Assessment #1</b> <i>Crimping of cross over and straight through cable and pinging.</i>	
<i>Week two</i> <i>Logical Layer</i>	
1	<b>PAN &amp; LAN:</b> Definition design, limitations and examples.
2	<b>WLAN:</b> Definition, design, limitations and examples.
3	<b>WAN:</b> Definition and study of common examples.
4	<b>Settings:</b> OSI model, Other models. Topology: Mesh, ring, star & bus. IP Address: class A, class B, class C, class D & class E, Subnet mask, default gateway, ISDN, protocols, switching theories, private IP address & public IP address.
5	<b>Network Type:</b> workgroup network, client/server network, workgroup with domain, workgroup without domain, converting workgroup to client/server.
6	<b>Workgroup Design:</b> requirements, nodes and resources, limitations and troubleshooting.
7	<b>Client/server:</b> requirements of network, requirements of server, requirements of client. Choosing network operating system: Windows server 2003, Novell NetWare, Mac OS X server, Red Hat server, Ubuntu server. Client operating system: Windows 9x, windows XP, Mac OS and various Linux Flavours.
<b>Assessment #2</b> <i>Design of a workgroup using switch of hub</i>	
<i>Week Three</i> <i>Layout &amp; Cabling</i>	

1	<b>Layout:</b> Feasibility study, setting goals, security issues, logical map drawing, physical map drawing, planning computer content.
2	<b>Cabling:</b> choosing topology, choosing network technology. Deciding on type of cable: coaxial and twisted pair (Ethernet). Deciding on Connectors: Coaxial cable connectors & twisted pair connectors.
3	<b>Cabling continued:</b> working with coaxial cable tools, working with Ethernet tools, advantages of a kit, working with Ethernet network kit, sketching plan, understanding & using the cabling rules, laying the cable, installing face plates.
4	<b>Cabling continue:</b> Labeling of cable, ceiling layout of cables, extension of nodes,
<b>Assessment #3</b> <i>Cabling &amp; installing connectors to a network.</i>	
<i>Week Four</i> <i>Wireless &amp; joining of networks</i>	
1	<b>RF for network:</b> advantage and disadvantage of wireless networks, performance, interference, wireless standards: 802.11b, 802.22a & 802.11g. Home RF, Bluetooth.
2	<b>Wireless NIC:</b> access point, NIC wireless, antennas, security issues, IP address & enabling Mac Address filtering, securing SSID, changing WEP keys. Using wireless in conjunction with cabled networks, examining wireless products: PC wireless devices, WPAN, WLAN, WWAN and adhoc network.
3	<b>Cabling methods:</b> peer-to-peer, direct cable, using Buddy BeTwin to connect two users, phone lines network, looking at phone lines network. Kits & products.
4	<b>Router:</b> Looking at router, router configurations, routing protocols, access points & base station, ISR router:
<b>Assessment #4</b> <i>Design &amp; Implementation of a wireless network</i>	
<i>Week Five</i> <i>Networking Software</i>	
1	<b>Logging &amp; mapping:</b> setting log on preferences, usernames passwords, logging odd network. Mapping drives, network paths, mapping in windows XP, mapping in Linux, accessing and disconnecting a mapped drive.
2	<b>Commands:</b> DOS commands for network, batch file for permanent connection, Linux network command or MAC OS commands for network.
3	<b>Antivirus &amp; Firewalls:</b> Installation & configuration, scanning nodes.
4	<b>Neighborhood:</b> Computers on windows network, computers on Mac OS

	network, computers on Linux, sharing & security. Installing network printer, sharing folders, sharing folders, sharing internet connection, sharing CD/DVD drives.
5	<b>Intranet &amp; Extranet:</b> Defining an intranet advantages & disadvantages of an intranet, creating content of intranet, installing TCP/IP, creating workgroup intranet without a server, creating workgroup intranet with a server, creating client/server intranet, looking at IIS. Defining extranets differences from intranets, private extranets, public extranets, design of an extranet.
6	<b>Internet:</b> Internet access, looking at the internet services, connection: phone lines, cable & DSL modems, high speed line. Access point equipment, analog modems, digital modem, Using hardware and software to share connection.
7	<b>Windows Registry &amp; Network Management tools:</b> Understanding the registry, defining the registry database, backup & recovery, modifying the registry, using the registry to modify network setting, limiting the use of network properties, limiting the use of password, adding IP address to a network adapter, using net watcher of Norx, Monitoring network with windows XP, considering Linux networking monitoring.
<b>Assessment #5</b>	
<i>Providing an internet access point to a network of Design of a company's intranet</i>	
<b>Assessment #6</b>	
<i>Design and configuration of DHCP server using windows server.</i>	