

WB-NST

Computer Networks Workbench



FEATURES

- Smooth surface with antistatic pad
- Movable caster wheel
- Circuit breakers for Protection
- Power supply sockets for 5 and 15 Amps
- Required network equipment
- Compute Server for DHCP, FTP and DNS
- Router & Layer 2 Switch
- Wireless Access Point
- LAN Trainer
- LAN Tool Kit
- STAR, BUS and RING Topology
- Network Protection and Troubleshooting
- CLI and Web Managed Configuration of a Switch & Router
- Configuring a WAP and Wireless LAN
- VLAN Set-up
- Protocols selection
- i) Stop and Wait ii) Go back to n iii) Selective repeat
iv) Sliding window v) Token Ring vi) Token Bus vii) CSMA / CD viii) CSMA / CA

SPECIFICATIONS

MECHANICAL AND ELECTRICAL SPECIFICATIONS

- Dimensions : 1500mm x 750mm x 750mm
- 25mm Table Top
- 30mm x 30mm aluminium extrusion
- Lockable castor wheels
- Cupboard with shelf : 450mm x 450mm x 450mm
- Drawer : 450mm x 450mm x 150 mm
- Computer Keyboard drawer under the table
- 50mm x 380mm
- Electric Panel height from table top 100mm
- 5 Sockets with circuit breaker
- Back panel 900mm above the table top
- Perforated sheet panel for hanging tools 600mm
- Baseplate for Computer 1000mm x 375mm

A) Compute Server - 1 No

- AMD EPYC 4004 / AMD B650 chipset.

- 16 GB DDR4 ECC RAM.
- 2 x 1 TB SATA HDD with RAID (0,1,5,10).
- Windows Server with Monitor, Keyboard and Mouse.
- Monitor, Keyboard, Mouse supplied with the Server.

B) Router – 1 No

- Aggregate throughput: 35 Mbps or better.
- 10/100/1000 WAN/LAN ports.
- RJ-45 based ports.
- 4 GB DDR3 ECC DRAM.
- 8 GB Flash Memory.
- Supports IPv4/IPv6, Static Routing, RIP, OSPF, EIGRP and BGP protocols.

C) Client Workstation – 3 Nos

D) Managed Layers 2 SWITCH – 1 No.

- 800 MHz processor.
- 512 MB SDRAM, 256 MB Flash memory.
- IEEE 802.1Q VLAN support.
- Supports up to 256 VLANs.
- IEEE 802.1X access control.
- Spanning Tree Protocol (STP) support.
- Address Resolution Protocol (ARP).

E) Wireless Access Point – 1 No

- Dual Band 5 GHz 802.11ac and 2.4 GHz 802.11n.
- 300 Mbps maximum data rate.
- 10/100/1000BASE-T Ethernet interface.
- 4 LAN ports and 1 WAN port.

F) Lan Trainer Kit

- Hardware Topology
- i) Star ii) Bus iii) Ring
- Nodes : 4 Nodes
- Data Rate : 10/100 Mbps
- **Interconnection** : RJ45 connection cable to connect hardware to computer LAN card
- Lan Training Software
- i) Star ii) Bus iii) Ring

Protocols selection

- Stop and Wait, Go Back to n, Selective Repeat, Sliding Window
- Token Ring, Token Bus
- CSMA/CD, CSMA/CA

- Packet Size : 128, 256, 512, 1024, 2048, 4096, 8192, 16384
- **Inter packet delay** : 1000, 2000, 3000, 4000, 5000ms
- **Error generation** : Bad packet, acknowledgment lost and auto error generation
- Encryption and decryption of data
- **Network details** : Indication of computer name, IP address, Port number, status of network, MAC address and operating system on computer.
- **Graphical representation** : Graphic representation of Data on software screen with differentiation of packet to be transmitted, packet being transmitted, packet transmitted with acknowledgment, packet with acknowledgment lost error, packet with bad packet error and packet which is discarded or resend.
- **Measurement and plotting**: Error rate calculation, Throughput calculation
- **Protocol analysis** : Indication of packet serial number, file name, file size, file number, receiver name, workgroup, receiver IP address, current packet, total packets, packet length, delay, protocol, topology, receiver MAC address, port number, packet send time, acknowledgment receive time, inter packet delay, data rate (MBPS), number of resend packets, acknowledgment value
- **Network analysis** : Indication of packet serial number, file name, file size, file number, receiver name, work group, receiver IP address, total packets, packet length, time out, protocol, topology, receiver MAC address, port number, file send start time, file sent completion time, transmission time, data rate (MBPS), error.

G) Lan Tool Kit - 1 Set

- LAN Cable Tester : 2 Nos
- RJ-45 Connectors : 200 Nos
- Crimping Tool : 2 Nos,
- Cat5e Cable : 100 mtrs.

Mechanical Tool Kit



- Tool Box / Tool Storage Case, Socket Set with Ratchet Handle, Socket Bits, Extension Rods, Ratchet Wrench, Hex Key Set (Allen Keys), Combination Spanner Set, Adjustable Wrench Set, Pipe Wrench, Chain Pipe Wrench, Combination Pliers, Long Nose Pliers, Diagonal Cutting Pliers, Water Pump Pliers, Locking Pliers, Hacksaw Frame with Blade, Tube Cutter, Pipe Cutter,

Utility Knife / Safety Knife, Claw Hammer, Rubber Mallet, Flat Files, Round Files, Metal Punch Set, Chisel Set, Screwdriver Set, Flat Head Screwdriver, Phillips Head Screwdriver, Tape Measure, Spirit Level, Wire Brush, Tin Snips / Metal Cutting Shears, PVC Pipe Cutter, Open End Spanner Set, Ring Spanner Set, Adjustable Pipe Wrench, Precision Bit Set, Measuring Scale / Steel Ruler.

Network Tool Kit



RJ45/8P8C crimping die, RG58/59/62/6 crimping die, F-type crimping die, Fiber-optic connector die, Krone impact crimping tool, Wire stripping tools, Mini LAN cable tester, Crimping tool, Soldering iron, Digital multimeter

CURRICULUM

The Objective of the workbenches is to teach the following Curriculum:

Types of Networks:

- Network Media—UPT Cables and wiring scheme, Topologies- Star, Bus & Ring Topology,

Server:

- Client and Server Roles, Peer to Peer Network, Install and Configure Windows Server, Install and configure Active Directory, Implementing AD Services, Configuring a Server as a Web and FTP Server, Mail Box , DHCP and DNS Services

Network Devices:

- Command line Interface & Web Managed Configuration of Switch, Configuring a WAP & Wireless LAN, Out of band and In band Management.

Network Switching and Routing:

- Study of OSI Layer (Physical, Data Link, Network & Transport Layer), Address Routing Protocol (ARP), IP Addressing technique (IP4/IP6) and Subnetting, Installation and Configuration of TCP/IP Protocol Utilities: PING, IPCONFIG, HOSTNAME, ROUTE, TRACERT etc. Packet Switching, Setup and configure a Virtual LAN , Spanning Tree Protocol, Command Line Interface and IP Routing, Network Protocols, Network Simulation Tools.

Protocols:

- i) Stop and Wait ii) Go back to n iii) Selective repeat iv) Sliding window v) Token Ring vi) Token Bus vii) CSMA / CD viii) CSMA / CA, Real Time Protocol Analysis – TCP/IP & UDP

*Image shown is for reference only and does not represent the actual workbench configuration or design.