

Department of CSIT
Organizes a 2-Day
Skill Development Workshop
On
Basic Networking Tools and Concepts

On 14-15 March 2016

In Joint Collaboration With

Skill Development Cell

Guru Ghasidas Vishwavidyalaya, Bilaspur - CG

Department of Computer Science and Information Technology (CSIT)

The department of CSIT is pleased to announce a 2-day workshop on Basic Networking Tools and Concept under skill development programme for the students, technical staff and faculty of G G University Bilaspur CG. In any institute (or even in an office), there are a number of computers. If we use them individually in standalone mode, we need to install costly software in each. In addition sometimes, we want to circulate a message, files or data to our colleagues connected by LAN (local area network), typically we depend on internet to send such data. Using the hands on training in the proposed workshop, participants will learn to establish and use LAN without need of internet. Moreover very basic terminologies and concepts of networking will be introduced in the workshop. The department has earlier organized web design workshop for nearly 800 students of G G University successfully.

1. Course Objectives

Computer networking fundamentals hands-on workshop,

- Identify and describe the various components of a computer network
- Explain how the Open Systems Interconnect (OSI) model works to simplify networking
- Identify and compare the different networking topologies
- Select appropriate cabling and connection options
- Compare and contrast peer-to-peer networking with the client-server model
- Identify the hardware and software components that make up a local area network (LAN)
- Identify the hardware and software components that make up a wide area network (WAN)
- Understand and configure the TCP/IP protocol including planning and implementation
- Understand the concept of resource sharing and apply it in your network
- Understand the fundamentals of network security and practice with network security tools
- Learn about Local Area Network Web Server and Mail Server

*Details are enclosed

2. Participants

The course for the workshop is so interesting and useful; we invite everyone to the workshop including faculty, technical staff, scholars and students. The purpose is that in many offices, departments and buildings the personals trained in this workshop can train their other colleagues. Especially in IUMS environment, every staff will use system. Looking to the importance of the course and our past experience, we expect hundreds of participants in this workshop.

3. Duration

The duration of workshop shall be two days. The hands on practice will be emphasized more with brief theoretical concepts. As the number of participants is expected to be in hundreds, we plan to offer the workshop in phases. We will accommodate nearly 30 participants due to space shortage in CSIT present location.

4. Certification

At the end of the workshop, participants shall receive a certificate of participation.

5. Date of start

Second week of March, (14-15 March 2016, or as suitable)

Course Outline

Module One: Introduction to Networking

In this module, you'll learn where today's powerful computers and networks came from, including some of the unsung heroes of information technology. You'll examine the differences between LANs (Local Area Networks) and WANs (Wide Area Networks) and see when to use each one.

- Brief history of computers and networks
- What is a LAN?
- What is a WAN?
- When do you use a LAN?
- When do you use a WAN?

Module Two: Understanding the OSI Reference Model

The OSI Reference Model provides a means of understanding the fundamentals of networking. It describes how data flows across a network. When you understand the OSI Reference Model, you'll make better decisions about equipment purchases and configurations and you make fewer mistakes with your network. In this module, you'll learn what it is, how it works, and how it's significant in even the smallest network. You'll even learn clever mnemonics to help you remember each of the layers!

- Understanding each of the seven layers
- Using the OSI Reference model in network design and troubleshooting
- Mapping equipment and protocols to the appropriate layers

Module Three: Common Topologies and Connection Options

This module will help you understand how networks are connected. You'll examine the different topologies, with a focus on the most common ones. You'll see how different cabling strategies are used based on the particular needs of each network. You'll also gain a good understanding of how and when to use wireless networking, plus you'll learn the critically important warnings about wireless networking.

- Star topology
- Tree topology
- Mesh topology
- Wireless topology
- Network cabling options
- Network architectures
- Types of cables

- Connection rates and terminology

Module Four: Networking Gear

In this module, you'll examine different types of networking gear. We'll actually bring several different pieces of equipment to the classroom so you can see and touch the different types of equipment. You'll understand the difference between hubs, bridges, switches, and routers and know when to use each one.

- Network Cards
- Hubs
- Bridges and Switches
- Routers
- Firewalls

Module Five: Understanding Networking Protocols Including IPv4 and IPv6

The TCP/IPv4 protocol suite is the most commonly used collection of networking protocols in the world. You'll learn how it works and understand how to do a basic IPv4 network design including subnets and private IPv4 addresses. You'll also learn how to avoid many common mistakes in IPv4 networks and how to troubleshoot common problems.

- IPv4 (formerly known as TCP/IP)
- Planning for your addressing needs
- Choosing the right protocols for your network
- Understanding an IP address and subnet mask
- What is the default gateway
- Configuring IP addresses on your network
- IP Version 6 (IPv6)
- Address Resolution Protocol (ARP)
- WAN protocols
- Tunneling protocols
- Security protocols

Module Six: Setting Up a Simple Peer-to-Peer Network

A peer-to-peer network is the simplest form of network. Appropriate for small offices and workgroups, a peer-to-peer network is also a great way to get an introduction to networking. You'll set up a simple Microsoft Windows peer-to-peer network using a Home group in the classroom and learn how to set up file and printer sharing to take advantage of its power.

- Understanding users and groups
- Adding and administering users
- Adding and administering groups
- Sharing resources
- Choosing the right protocol(s)

- Sharing printers
- Sharing files
- Understanding the Universal Naming Convention

Module Seven: Name Resolution Technologies

Maybe you've noticed the DNS (Domain Name System) server settings when configuring IPv4 or IPv6 on a computer or a router. In this module, you'll learn what DNS is and why it's important to you and your network. Name resolution technologies are like telephone books for networks. You may know a website by its URL, but the computers and networks know it by its IPv4 or IPv6 address. Name resolution technologies translate friendly URL types of names to an IPv4 or IPv6 address that can be understood by the computers and routers. You'll learn four different name resolution technologies and understand when to use each one.

- Host File
- What is DNS?
- DNS in a nutshell
- The structure of the DNS database
- Windows DNS server
- Dynamic DNS
- DNS resource records
- Domain names
- Top-level domains (TLDs)

Module Eight:- Web Technology on the Internet

- Origin of the Internet
- Packet switching
- Arpanet
- Emergence of international operations
- Creation of a common protocol
- TCP/IP addresses and domains
- The World Wide Web
- Transaction classes - the new model

Module Nine:- Web Server for Local Area Network

- Web Server for Local Area Network
- Installation
- Configuring
- Basic Web Design
- Deployment of Web server over Local Area Network

Module Ten : Mail Server for Local Area Network

- Mail Server for Local Area Network

- Installation
- Configuring
- User ID and Mail space creation
- Deployment of Mail server over Local Area Network

Module Eleven : Common Network Operating Systems

There are many different network operating systems on the market today, including the increasingly popular Linux operating system. You'll see and compare Microsoft and Linux operating systems and learn how to choose the one that's right for you.

- Windows Server 2012
- Linux, including a brief examination of different Linux distributions
- UNIX

Module Twelve: Network Security

Network security is a vast, complex, and ever-changing world. In this module, you'll learn the fundamentals of network security including common security mistakes, common vulnerabilities, and best practices for implementing a basic security plan. You'll also learn how to use a port scanner and other security tools to assist in auditing your network for vulnerabilities.

- Physical security
- Passwords
- The "run-as" command in Windows 8 and Server 2012
- Port scanning
- Baseline security analyzer
- Windows Server 2012 Security Configuration Wizard
- Classification of Firewalls
- Understanding encryption, including PKI and SSL/TLS

Hardware and Software Troubleshooting

Even small networks are complex beasts which occasionally fail to perform as we expect. When that happens, good network troubleshooting procedures and techniques are true lifesavers. You'll learn how to isolate and identify common network problems, how to fix them, and how to keep them from recurring.

- Basic network troubleshooting checklist
- Troubleshooting physical problems
- Troubleshooting logical problems
- Common troubleshooting tools