

# Network Architecture and Security

## Summer Training – Course Curriculum

### Basics of Networking and Digital Connectivity

- Concepts of IP Address and MAC Address
- How Computer Talks ?
- How Data Packets Travells in Network Wires ?
- Public v/s Private IP Address
- Static v/s Dynamic IP Address
- IP Addressing, Subnetting and Supernetting
- Types of Servers: DNS Server, DHCP Server, Web Server, Database Server, Etc
- Networking Protocols: TCP, UDP, NetBIOS, ARP, HTTP, SMTP, POP, etc
- Using Telnet Sessions

### Essential Networking Concepts and Applications

- Introduction to Virtual Private Networks
- Setting Up a Virtual Network Lab
- Using Real VNC Server and Client
- Netcat: Best Remote Data Transfer Tool
- Putty: Best Session Management Tool
- Using Team Viewer: Remote Desktop Connections

### Setting Up a Local Area Network

- Making Network Wires: Cross Cables and Parallel Attacks
- Configuring Network Routers
- Performing Security Measures in Network Router
- Configuring DNS and DHCP Services in Network Router
- Router Remote Administration
- Security Holes in Airtel and BSNL Routers

### Attacks on Networks

- Port Scanning: NMAP World Renowned Port Scanner
- Type of Port Scanning: TCP Scan, UDP Scan, XMAS Scan, Vanilla Scan, Stealth Scan
- Computer OS Fingerprinting
- Active Fingerprinting v/s Passive Fingerprinting
- Network Sniffing: Monitoring Network Data
- Attacks on Switched Network and Routed Network
- Active Sniffing v/s Passive Sniffing
- ARP Poisoning: Man in the Middle Attack
- Filtering Passwords on Network
- DNS Spoofing and Poisoning
- Filtering Data Packets on Network

## **Introduction to Firewall**

- Firewall v/s Anti-Virus
- Host Based IDS v/s Network Based IDS
- Configuring a Host Based Firewall: Windows Firewall
- Configuring a Network Based Firewall
- Firewall Log Analysis

## **Introduction to Proxy Servers**

- Services in Proxy Server: Caching, Blocking
- Configuring a Proxy Server: Cyberoam
- Maintaining a Website Black List
- Port Blocking in Proxy Firewall
- Performing Security Measures in Proxy Servers

## **Attacks on Firewalls and Proxy Servers**

- Firewall Black List Bypassing
- HTTP Tunneling
- Port Forwarding
- Sock Chain Proxy Tunneling
- Transparent Proxies v/s Anonymous Proxies

## **Introduction to Intrusion Detection Systems**

- Working of Intrusion Prevention Systems
- Host Based IDS v/s Network Based IDS
- Configuring a Host Based IDS
- Analyzing IDS Logs
- Setting Up Filters in IDS
- Detecting Denial of Service Attacks
- Blocking External Network Packets

## **Introduction to Wireless Technology**

- Configuring Wireless Networks
- Setting Up SSID, Channel, Area, etc
- Broadcasted v/s Hidden Wireless Networks
- Performing Security on Wireless Network: MAC Filtering, WEP Key, WPA Key, WPA2 Key
- Different Algorithms and Encryption Techniques in Wireless Security: AES, TKIP

## **Attacks on Wireless Networks**

- Wireless Network Scanning: War Driving

- Active War Driving v/s Passive War Driving
- Capturing Atmospheric Wireless Packets
- Replaying Deauth Wireless Packets
- Decrypting WEP Key
- Collecting WPA and WPA2 Wireless Hashes
- Dictionary Attack on WPA Keys
- Configuring Rouge Access Points
- Attacks on Wireless Hotspots