

# King Fahd University of Petroleum & Minerals

## Electrical Engineering Department

### EE 400, Experiment # 5

## Design of Simple and Complex Networks using ConfigMaker Tool

### Objectives:

In this experiment students will learn ConfigMaker software tool and use it to design elementary and complex networks using different types of networking components e.g hosts/servers, hubs, switches and routers/gateways. They will also learn how to provide Internet connectivity to corporate network by different types of redundant links (e.g. ISDN leased line, Frame Relay etc) with the configuration of Firewall protection on the gateway router.

### Introduction:

Cisco ConfigMaker is an easy-to-use Windows application that configures Cisco routers, switches, hubs, and other devices. Using a graphical user interface (GUI), you draw your network, and then Cisco ConfigMaker creates the Cisco IOS configuration files for the devices on your network without requiring you to know the Cisco IOS command-line interface (CLI). You can also use Cisco ConfigMaker as an off-line tool. Without having the devices on-hand, you can draw and configure your entire network until you are ready to deliver the configuration to them.

To start Cisco ConfigMaker, select *Start>Programs>Cisco ConfigMaker V2.5.1* from the Windows Start menu.

### Salient Features Overview:

Feature	Cisco ConfigMaker Support
<b>Devices</b>	<ul style="list-style-type: none"> <li>• Routers-Cisco 800, 1000, 1600, 1700, 2500, 2600, 3600, and 4000 (excluding routers with Token Ring)</li> <li>• Switches-Cisco 1548, 1548M Micro Switch 10/100</li> <li>• Hubs-Cisco 1538, 1538M Micro Hub 10/100, Cisco FastHub 412, 412M, 424, 424M</li> </ul>

	<ul style="list-style-type: none"> <li>Stacks-Cisco Micro Hub Stack, Cisco FastHub Stack</li> <li>Other-Cisco Cache Engine (only configures Web Cache Communication Protocol (WCCP) version 1 on the router)</li> </ul>
<b>LAN connections</b>	Ethernet, Fast Ethernet
<b>WAN connections</b>	<ul style="list-style-type: none"> <li>ISDN BRI, ISDN PRI, ISDN leased line (Cisco 1603 and 1604 only)</li> <li>Frame relay, Point-to-Point Protocol (PPP), High-Level Data Link Control (HDLC), asynchronous, PPP over Ethernet (PPPoE) for Cisco 1700 series routers, and voice line</li> <li>POTS (for the 800 routers)</li> </ul>
<b>Routing protocols</b>	EIGRP, RIP version 2, Static Routing (IP only)
<b>Virtual Private Network (VPN)</b>	<ul style="list-style-type: none"> <li>Configures IPSec and Internet Key Exchange (IKE)</li> <li>Uses pre-shared key method for authentication; configure hashing method, encryption method, security association (SA) timeout values</li> <li>Draws VPN connections between point-to-point sites</li> </ul>
<b>Quality of service (QoS)</b>	<ul style="list-style-type: none"> <li>Configures QoS settings on WAN interfaces to prioritize voice traffic</li> <li>Configures Committed Access Rate (CAR) to limit bandwidth for certain sites and applications</li> </ul>
<b>Voice</b>	<ul style="list-style-type: none"> <li>Supports voice-over-IP (VoIP) connection to telephones, facsimiles, Private Branch Exchanges (PBXs), and Public Switched Telephone Networks (PSTNs)</li> <li>Supports an analog telephone connection to the Cisco 803 and 804 routers</li> <li>Supports 2BRI-NT/TE voice interface cards (VICs) on Cisco 1751 router only</li> <li>Configures QoS settings on WAN interfaces to prioritize traffic</li> <li>Caller ID capability on VIC-2FXO-M1, VIC-2FXO-M2, VIC-2DID/FXS, and VIC-2FXS (1700 series only)</li> <li>Direct Inward Dialing (DID) capability on VIC-2DID/FXS</li> </ul>
<b>Backup</b>	Backs up a Frame Relay, PPP, HDLC, or an ISDN leased line connection with a dial up, an ISDN, or another serial connection
<b>Simple Network Management Protocol (SNMP)</b>	<ul style="list-style-type: none"> <li>Configures read community string and read/write community string.</li> <li>Configures SNMP trap manager</li> </ul>
<b>Dynamic Host</b>	Configures DHCP server or DHCP relay

<b>Control Protocol (DHCP)</b>	
<b>CSU/DSU</b>	Configures CSU/DSU module (not supported on ISDN PRI network modules)
<b>Other features</b>	<ul style="list-style-type: none"> <li>• AutoDetect Device Wizard-automatically identifies your device</li> <li>• IP Subnet Calculator-calculates IP and subnet masks</li> <li>• Ping Device-pings any address on your network</li> <li>• Issue show commands-runs <b>show</b> commands on your router</li> <li>• WAN Configuration Worksheets-assists in gathering data for your connection</li> <li>• Instant Upgrade-easily upgrades Cisco ConfigMaker</li> <li>• Cisco ConfigMaker Tutorial-guide to using Cisco ConfigMaker</li> </ul>
<b>System requirements</b>	<ul style="list-style-type: none"> <li>• 80486 or Pentium-class computer</li> <li>• Windows 98, Windows Me, Windows 2000, or Windows NT 4.0 with at least Service Pack 3</li> <li>• 16 MB RAM</li> <li>• 20 MB disk space</li> <li>• 800 x 600 display with at least 256 colors</li> </ul>

### Exercise:

1. Design network of a lab using hosts and a hub
2. Design network of a building using hosts, hubs, and switch.
3. Design network of two buildings connected with each other by a router.
4. Design a primitive network of a university/organization with Internet connectivity and firewall protection using ISDN and Frame Relay redundant links..

**Note:** Network details including device type and IP address ranges will be specified in the lab by the lab instructor.