Chapter VI

Network Basics and Securing the Network Infrastructure

Introduction

In Chapter I, we outlined the many causes of insecurity in the information communication technology (ICT) infrastructure. We indicated one particular weakness as users with little knowledge of the working of the communication infrastructure. In this chapter, we intend to address that concern. We give a very elementary treatment of the theory of networks and then outline the best network security solutions.
Computer Network Basics

What is a computer network? A computer network is a distributed system consisting of loosely coupled computers and other devices as network nodes. Any two nodes of this network can communicate with each other through a communications medium by observing a set of communicating rules or protocols that each device in the network must follow to communicate with another in the network. The resulting combination, consisting of hardware and software, is a computer communication network, or computer network, in short. Figure 1 shows a computer network.

Network nodes may own resources individually that are locally or globally accessible. Each network has application programs and network protocols that are used to synchronize, coordinate, and bring about the sharing and exchange of data among the network elements. Network software also makes the sharing of expensive resources in the network possible. Network elements, network software, and users all work together so that individual users get to exchange messages and share resources on other systems that are not readily available locally. The network elements, together with their resources, may be of diverse hardware technologies and the software may be as different as possible, but the whole combination must work together in unison.

Computer networks are used in a variety of ways and in different settings including business, like baking, and education, like computing laboratories and research. Whether in special setting or in a home connected to the Internet via an Internet service provider (ISP), like BellSouth or AT&T, computer networks provide a variety of services including:

Figure 1. A computer network
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