- Linux servers primarily operate without any human interaction
- The server runs programs that provide shared resources (called services)

- Linux service program runs continually as a background process, it's called a daemon, not demon. Linux daemon programs often end with the letter d to indicate they're daemon processes

- Common Internet well-known port numbers | TABLE 2.1

- internet daemon (inetd)
  - listen for specific requests from clients
  - launch the appropriate service program when needed
  - uses the /etc/inetd.conf configuration file to allow you to define the services

- extended internet daemon (xinetd)
  - contains additional features
    - access control lists (ACLs)
    - more advanced logging features
    - the ability to set schedulesto turn services on and off

- Systemd startup method can utilize systemd unit files to replace the functionality provided by inetd or xinetd

- Services Protocols & Ports
  - /etc/services file contains all of the ports defined on a Linux server

- There are some basic Internet services that Linux servers are known to do well
  - Web services
    - Apache Web Server
    - nginX Web Server: advanced 'built in' features
      - + web proxy
      - + mail proxy
      - + web page cache
      - + load-balancing server
      - # high-volume environments
      - # nginX as a load-balancing front end to multiple Apache on the backend
    - lighthttpd web server
      - combine basic web and built-in database services

  - Database services
    - PostgreSQL Server
    - MySQL Server

- MongoDB Server

  - Email services
    - Linux modular email environment | FIGURE 2.1

- Serving Local Networks
  - File Servers
    - Two common server software packages for sharing files
      - Network File System (NFS): nfs-utils software package
      - Samba: allow Linux systems to interact with Windows clients and servers

  - Print Servers
    - Common Unix Printing System (CUPS)
      - standard Linux print sharing software package
    - Internet Printing Protocol (IPP)

- Network Resource Servers
  - Dynamic Host Configuration Protocol (DHCP)
    - Linux DHCP server package is called DHCPd
    - For Linux DHCP clients, there are three popular packages
      - dhclient
      - dhcpcd
      - pump

  - Logging
    - log files are normally stored locally in the /var/log directory
    - two main logging packages used in Linux
      - rsyslogd
      - journald

  - Name Servers
    - Linux servers use BIND software package to provide DNS Services
    - DNSSEC protocol incorporates a layer of encryption around the standard DNS

  - Network Management
    - Simple Network Management Protocol (SNMP)
    - most popular SNMP software package is net-snmp

  - Time
    - Network Time Protocol (NTP); ntpd

- Authentication Server
  - /etc/passwd (non-secure legacy systems) or /etc/shadow file

- Network Information System (NIS)
  - nis-utils package is an open source project for implementing an NIS

- Kerberos
  - to securely authenticate users with a centralized server database

- Lightweight Directory Access Protocol (LDAP)
  - OpenLDAP server to authenticate requests made by clients

- Certificate Authority
  - OpenSSL package provides standard certificate functions for both servers and clients.

- Access Server (SSH)
  - most popular software package in Linux environment is OpenSSH

- Virtual Private Network (VPN)
  - a popular VPN solution is the OpenVPN package

- Proxy Server
  - most popular web proxy server in Linux is the Squid package
  - nginX web server package

- Monitoring
  - Nagios software package is a popular tool especially in cloud Linux systems

- Improving Performance
  - Clustering
    - dividing application functions among multiple servers
    - Each server node in the cluster is configured the same and
    - Each server node in the cluster can perform the same functions
    - Cluster management software determines how servers work

  - Load Balancing
    - Common Linux load-balancing packages
      - HAProxy
      - Linux Virtual Server (LVS)
      - nginX web server