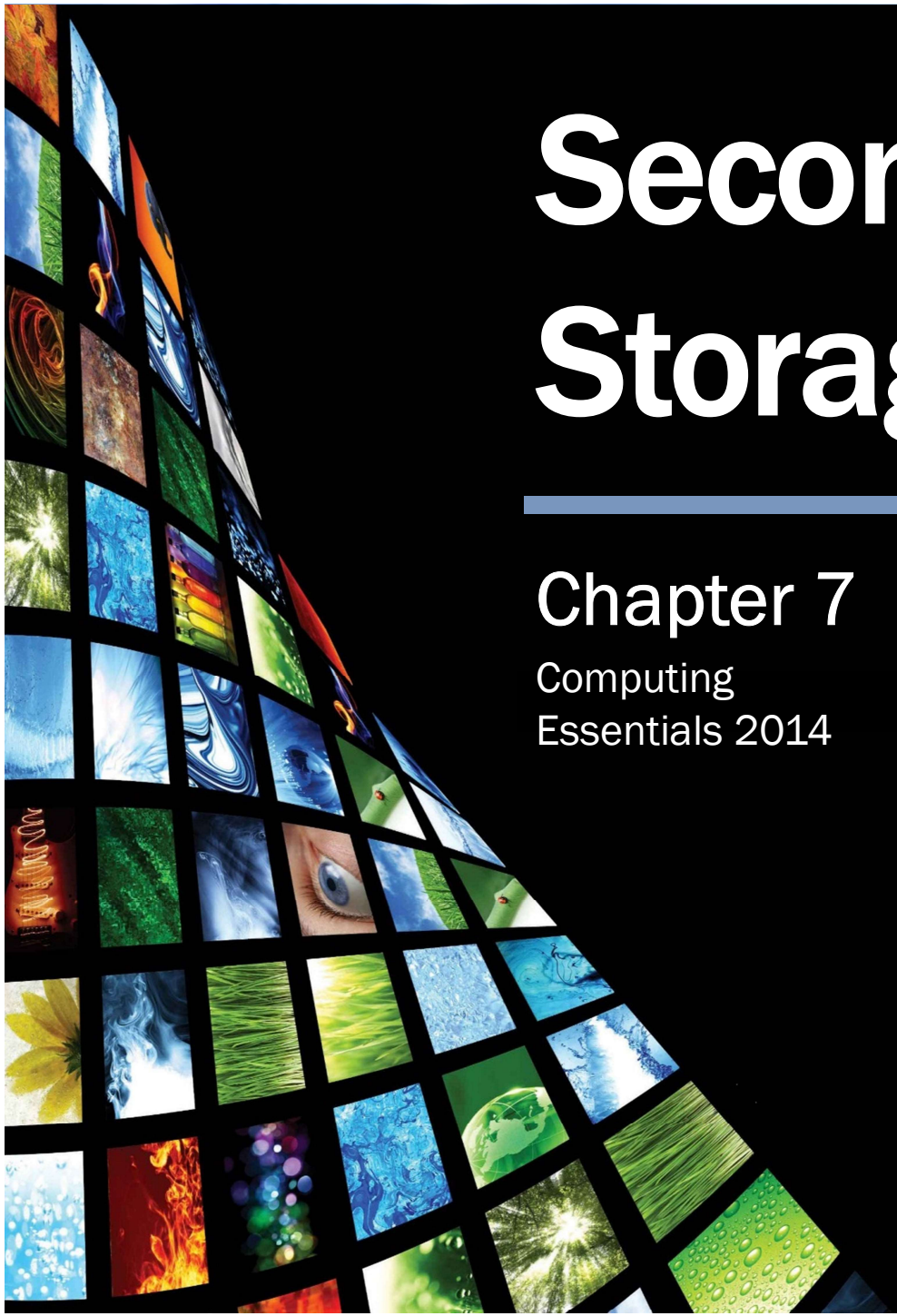


Secondary Storage

Chapter 7

Computing Essentials 2014

Competencies (Page 1 of 2)

- Distinguish between primary and secondary storage.
- Discuss the important characteristics of secondary storage, including media, capacity, storage devices, and access speed.
- Describe hard disk platters, tracks, sectors, cylinders, and head crashes.
- Compare internal and external hard drives.
- Discuss performance enhancements including disk caching, RAID, file compression, and file decompression.

Competencies (Page 2 of 2)

- Define optical storage including compact discs, digital versatile discs, and Blu-ray discs.
- Define solid-state storage, including solid-state drives, flash memory cards, and USB drives.
- Define cloud storage and cloud storage services.
- Discuss mass storage, mass storage devices, enterprise storage systems, and storage area networks.

Introduction

- Data storage has expanded from text and numeric files to include digital music files, photographic files, video files, and much more.
- These new types of files require secondary storage devices with much greater capacity.
- In this chapter, you learn about the many types of secondary storage devices including their capabilities and limitations.

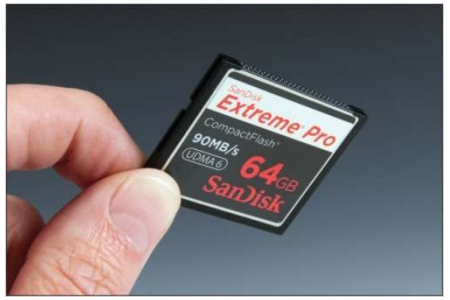
Storage

- Primary storage
  - Volatile storage
  - Temporary storage
  - Random Access Memory (RAM)

- Secondary storage
  - Nonvolatile storage
  - Permanent storage
- Secondary storage characteristics
  - Media
  - Capacity
  - Storage devices
  - Access speed

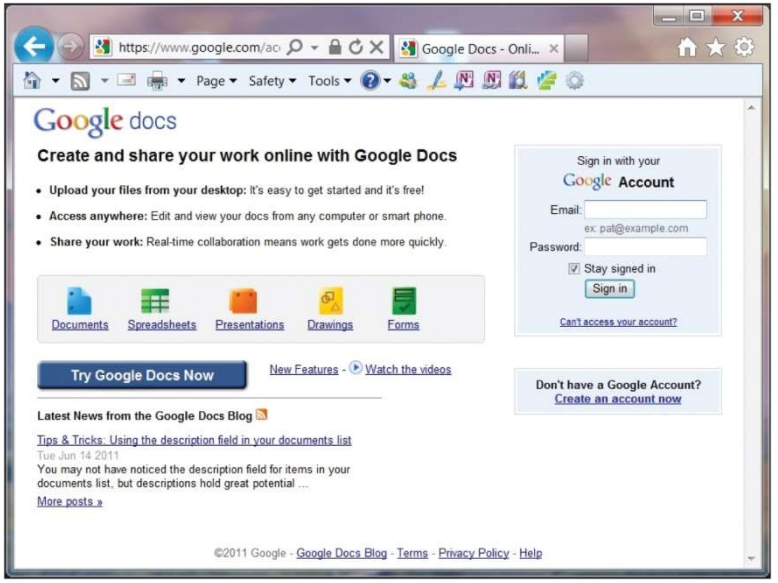
Solid-State Storage

- Solid–state drives (SSDs)
  - No moving parts
  - Faster and more durable than hard disks
- Flash memory cards
  - Widely used in computers, cameras, and portable devices such as mobile phones and GPS navigation systems
- USB Drives (or Flash Drives)
  - Connect to USB port
  - Capacity of 1 GB to 256 GB



Cloud Computing

- Cloud computing is where the Internet acts as a “cloud” of servers
  - Applications provided as a service rather than a product
  - Supplied by servers
- Google Apps
- Mint.com

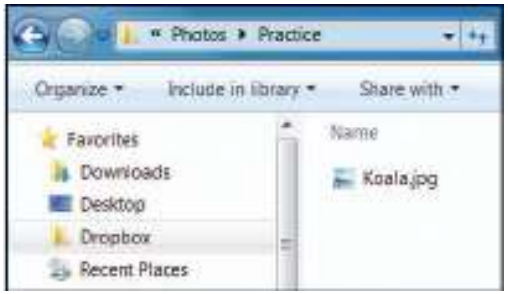


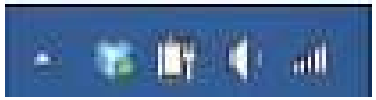
Cloud Storage Services

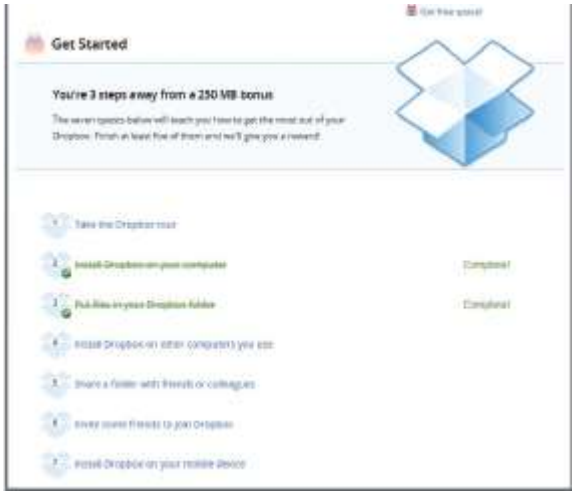
Company	Location
Dropbox	www.dropbox.com
Google	drive.google.com
Microsoft	www.skydrive.com
Amazon	amazon.com/cloud
SugarSync	www.sugarsync.com

Making IT Work for You ~ Cloud Storage

- Using a cloud storage service makes it easy to upload and share files with anyone.



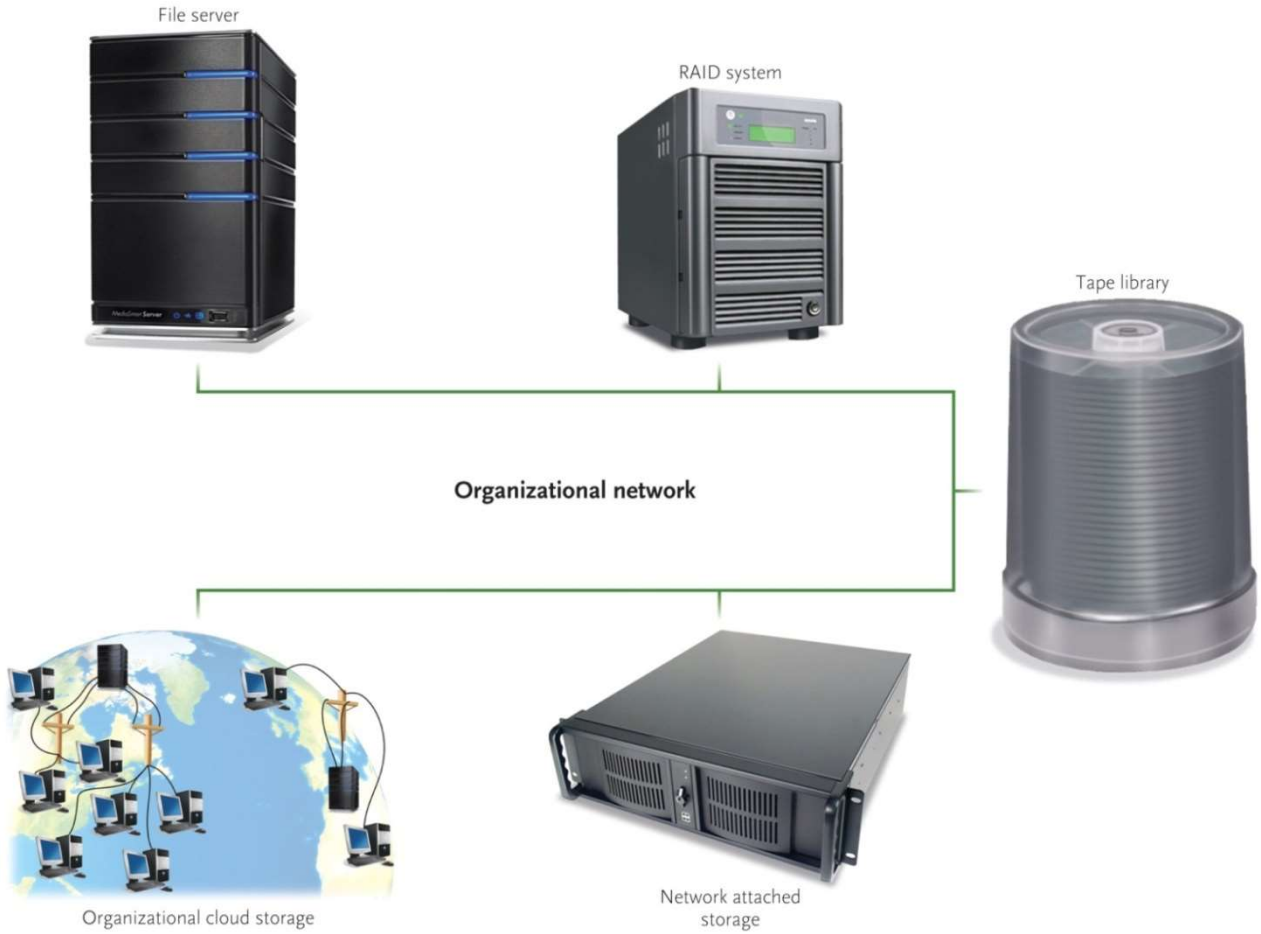




Mass Storage Devices

- Large amounts of secondary storage called mass storage
- An enterprise storage system strategy ensures efficient and safe use of data across an organizational network Devices include:
  - File servers
  - Networked attached storage (NAS)
  - RAID systems
  - Tape libraries
  - Organizational cloud storage

Enterprise Storage Systems



Storage Area Network (SAN)

- Architecture to link remote computer storage devices, such as enterprise storage systems, to computers such that the devices are available as locally attached drives
- User's computer provides file system, but SAN provides disk space
- House data in remote locations and still allow efficient and secure access

Careers In IT

- Disaster recovery specialists are responsible for recovering systems and data after a disaster strokes
- General employer requirements
  - Bachelors degree in computer science
  - Extensive knowledge of computers and technology
  - Communication and analytical skills
- Annual salary of $70,000 to $103,000

A Look to the Future ~ Where are you storing your files?

- At some point, hard drives will no longer be able to keep up
  - Looking at ways of increasing capacity without increasing size
  - Currently hard drive maxes out at 128 GB per square inch.
  - New technologies may advance this to 6.25 TG (6,250 GB) per square inch.

Open-Ended Questions (Page 1 of 2)

- Compare primary storage and secondary storage, and discuss the most important characteristics of secondary storage.
- Discus hard disks including density, platters, tracks, sectors, cylinders, head crashes, internal, external, and performance enhancements.
- Discuss optical disks including pits, lands, CDs, DVDs, Blu-ray, and hi def.

Open-Ended Questions (Page 2 of 2)

- Discuss solid-state storage including solid-state drives, flash memory, and USB drives.
- Discuss cloud computing and cloud storage.
- Describe mass storage devices including enterprise storages systems, file servers, network attached storage, RAID systems, tape libraries, organizational cloud storage, and storage area network systems.