USB Flash Drives Overview
## By
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USB Flash Drives – What are they?

- Portable storage devices

- Nonvolatile electronically encoded Flash Memory

- Originally designed for use in BIOS

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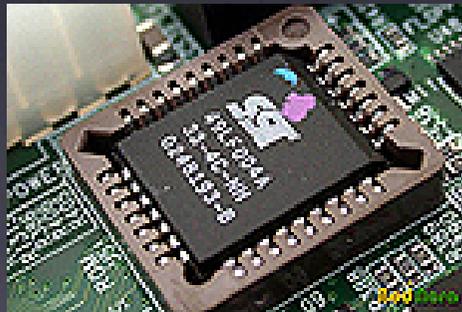
USB Flash Drives – What are they?

- USB 1.1 or USB 2.0 – Separate card reader/encoder unnecessary

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- Recognized & mounted by operating system as an external drive

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USB Flash Drives – What are they?

- They can be...
  - Written to & read from
  - Erased, reformatted, & partitioned

- They are...
  - Compact & easy to transport
  - Inexpensive & widely available
  - Easy-to use & come in a variety of capacities

USB Flash Drives – Basic Features

- Interface
  - USB 1.1
    - 12 Mb/sec data transfer
    - Compatible with USB 1.1 and USB 2.0 Ports
  - USB 2.0
    - 480 Mb/sec data transfer
    - Compatible with USB 2.0 Ports only

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USB Flash Drives – Basic Features

- Compatibility

  - Most function with Mac, Windows, Linux out of box

    - Older versions of Mac OS and Windows may need separate drivers

    - Some preprogrammed features not compatible with certain platforms and/or operating systems

  - Only solution – in depth research ahead of time

    - Independent & manufacturers documentation

    - Disk/directory repair & maintenance apps

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USB Flash Drives – Basic Features

- Physical Size

  - On average, they are the size & weight of a pack of chewing gum

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  - iOmega Micro Mini USB Flash Drives

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USB Flash Drives – Basic Features

- Physical Size (Cont)
  - Inherent portability leads to the addition of carry accessories
    - Pen–style clip
    -
    - Key ring
    -
    - Lanyard
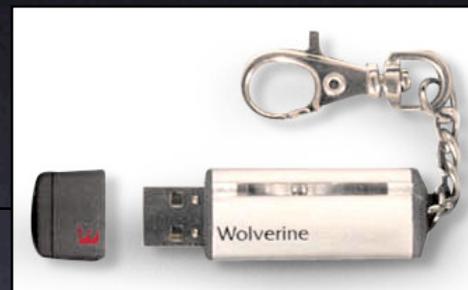
USB Flash Drives – Basic Features

- Expandability
  - Relatively new & unique feature
  - Currently, only memory upgrades are available
    - Snap-on memory module
    - Flash memory card slot

  - The future: "LEGO-like" modular units?

USB Flash Drives – Basic Features

- Durability
  - More robust than CD/DVD media, floppies, Zips
  - No moving internal parts to damage
  - Nonvolatile flash memory resistant to:
    - Magnetic fields & airport X-ray machines
    - Moderate temperature & humidity
    - Water submersion (dry thoroughly before use)
  - 10 yrs degradation free

USB Flash Drives – Basic Features

- Capacity

Drive Capacity	Avg Price Range ($US)
16 MB	20-30
32 MB	**20-30**
64 MB	**25-50**
128 MB	**40-60**
256 MB	70-90
512 MB	140-200
1 GB	280-310
2 GB	540-850

USB Flash Drives – Basic Features

- Security

  - Read/Write protection switch

    - Available on all capacities

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  - Basic password protection

    - Available on all capacities
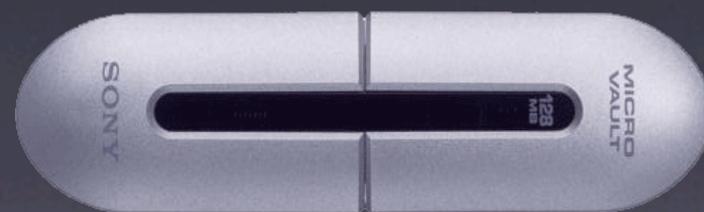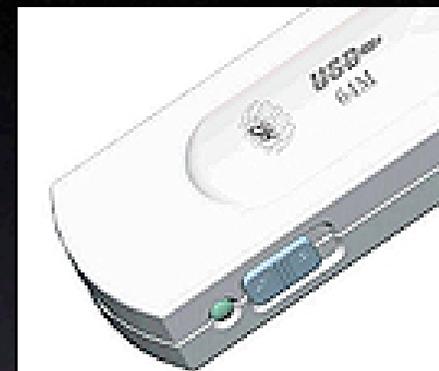
USB Flash Drives – Basic Features

- Security (Cont)

  - 128 bit AES encryption

    - NIST standard symmetric-key algorithm

    - Fast and highly secure encryption/decryption

    - 16 MB to 128 MB capacities

    - Doubles the cost

USB Flash Drives – Basic Features

- Security (Cont)
  - Biometrics – Fingerprint Scanners
    - Scans fingerprint & compares against template
    - Available on moderate capacity drives
    - Triples the cost

USB Flash Drives – Basic Features

- **Multiple Functions**
  - USB Flash Drives equipped with other functions
    - MP3 player
    - Digital voice recorder
    - FM radio
    - 1.3 megapixel digital camera

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USB Flash Drives – Basic Features

- Multiple Functions (Cont)
  - Everyday devices equipped with a USB Flash Drive
    - Pen
    -
    - Wristwatch
    -
    - Swiss Army Knife

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USB Flash Drives – Mac Specifics

- Interface – Apple Hardware USB Configuration

2003	USB 2.0 ports: Compatible with any USB 1.1 or USB 2.0 drives
1998 - 2003	USB 1.1 ports: Compatible with USB 1.1 drives only. USB 2.0 can be added with compatible expansion card.
Before 1998	No built-in USB compatibility. USB 1.1 and USB 2.0 can be added with compatible expansion card but research is required.

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USB Flash Drives – Mac Specifics

- File System Format Support

  - Resource Fork

    - Mac OS 9.2.x and Mac OS X apps store critical info in "resource fork"

    - When stored on file formats not supporting resource and data forks files, files can become corrupted.

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USB Flash Drives – Mac Specifics

- File System Format Support (Cont)
  - HFS+
    - USB Flash Drives support HFS file format
    - Saving files onto HFS formatted drive one way to avoid corruption

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USB Flash Drives – Mac Specifics

- Mac OS X Compatibility – Demonstration
  - "Plug and Play"

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  - Apple Disk Utility

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  - Carnegie Mellon University Disk Erase

USB Flash Drives – Mac Specifics

- Mac OS X Third-Party Applications – Demonstation

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  Micromat TechTool Pro 4.x

  MicroMat Drive 10 1.x

  Alsoft DiskWarrior 3.x (Demonstration)

  Prosoft Engineering Data Rescue 10.x

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USB Flash Drives – Mac Specifics

- Security Option – Demonstration
  - Disk Utility password protected Disk Image
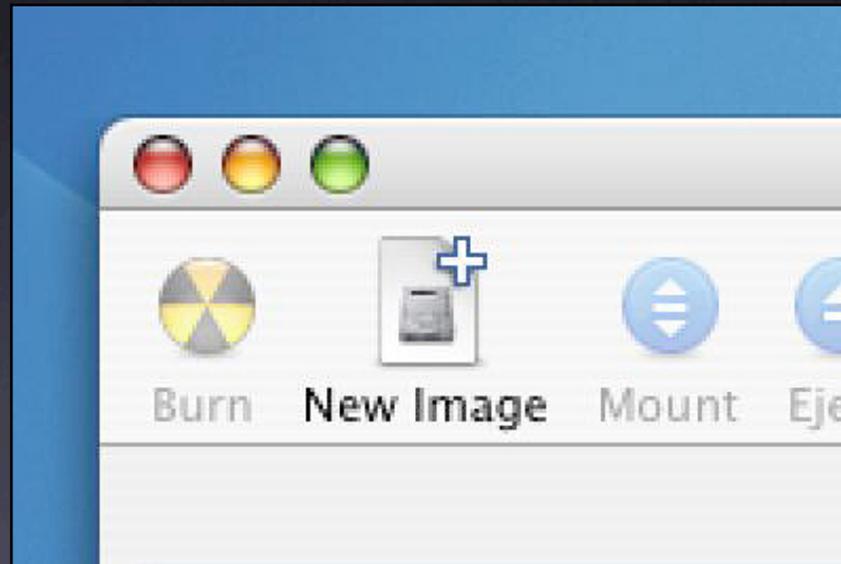
USB Flash Drives – Mac Specifics

- Mac OS 9.2.x Compatibility

  - "Plug and Play" may not be applicable: Depending on the type of USB Flash Drive, additional drivers may be needed for older versions of Mac OS.

  - Our test drive worked with Mac OS 9.2.2

Crucial Gizmo 256 MB USB

USB Flash Drives – Mac Specifics

- Mac OS 9.2.x Compatibility (Cont)
  - Apple Repair/Recovery applications offer mixed results
  - Drive Setup

Drive Setup

List of Drives

Volume Name(s)	Type	Bus	ID	LUN
\<not supported\>	USB	0	0	0
Hard Disk	ATA	2	0	0
MMC RevR Extra	ATA	2	1	0
\<DVD-ROM drive\>	ATAPI	0	0	0
\<not supported\>	ATAPI	0	1	0

Cannot initialize a disk in an unsupported drive.

Initialize...

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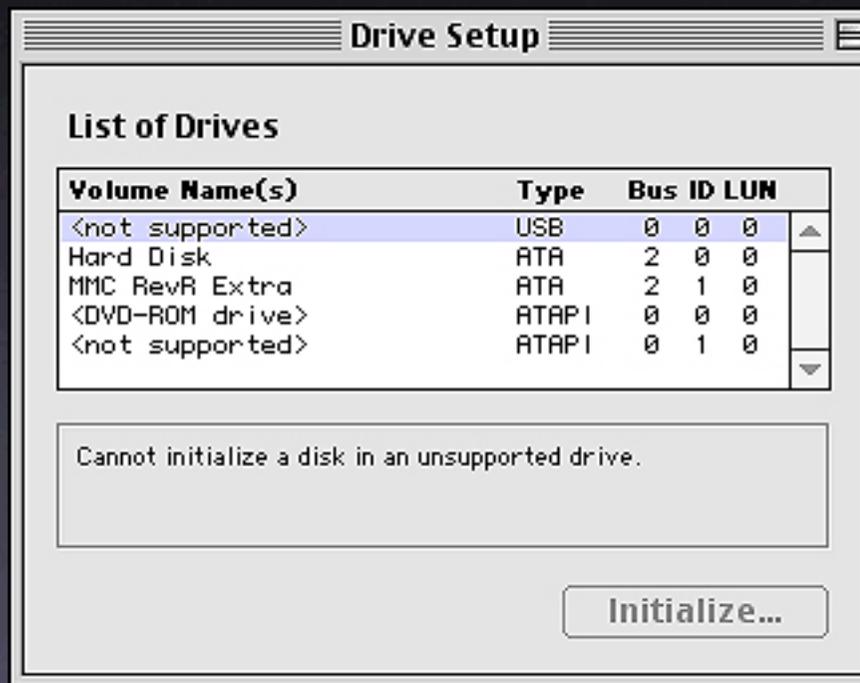
USB Flash Drives – Mac Specifics

- Mac OS 9.2.x Compatibility (Cont)

  - Disk First Aid
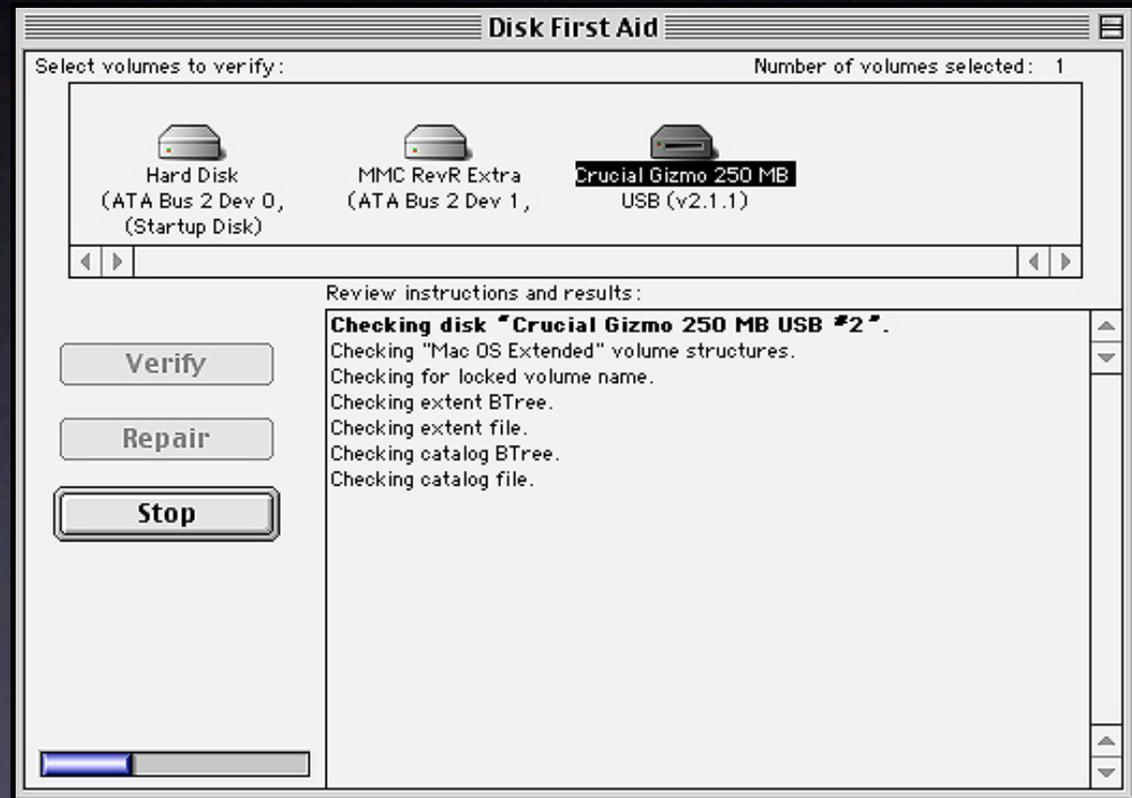
USB Flash Drives – Mac Specifics

- Mac OS 9.2.x Compatibility (Cont)
  - DiskWarrior 3.x

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USB Flash Drives – Vendors

- Reliability

  - Many manufacturers, many products– Not a great deal of documentation

  - Conventional wisdom – Go with established IT companies

  - Larger capacity drives and high–end security features are more readily available from smaller firms

USB Flash Drives – Vendors

- Online Documentation
  - "Catalog" of information is small but growing
  - Patient and varied search should yield results
  - Two Examples:
    - http://www.homeofficereports.com/Flash%20Readers.htm
    - http://reviews-zdnet.com.com/USB_Flash_Drives/4520-3240_16-5128560.html

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USB Flash Drives – Vendors

- Manufacturers

Crucial	Interactive Media - Kanguru
iOmega	JMTEK
Lexar Media	SanDisk
SimpleTech	Sony
Wolverine	

USB Flash Drives – Pros & Cons

- Pros – General

  - Small physical size, large capacities, very portable.

  - Relatively inexpensive & widely available

  - Inexpensive and faster alternative to CD/DVD burning

  - Resistant to mag fields, x-rays, water, & temp

  - Sophisticated security options available

  - Upgradable & multifunctional

  - Most come with limited warrantees

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USB Flash Drives – Pros & Cons

- Pros – Mac

  - Disk Utility password protected disk image offers another level of security

  - Few compatibility issues with Mac OS X & Mac OS 9.2.x

  - Few compatibility issues with major disk & directory repair & recovery applications

  - Ideal moderate capacity storage solution for owners of USB Macs (no built-in floppy or Zip drives)

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USB Flash Drives – Pros & Cons

- Cons – General

  - Small size makes them easy to lose or steal

  - Once lost/stolen, there is the possibility that stored data will be accessed

  - Higher per megabyte cost compared to other storage media & devices

  - Very little extensive or comprehensive performance reviews, reports, testing, & feedback.

  - May be durable but not indestructible & susceptible to viral infection

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USB Flash Drives – Pros & Cons

- Cons – General (Cont)

  - Forget your password, resetting the drive will cost you your files

  - Forget your PIN on your 128 bit AES encrypted drive, forget accessing your files

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USB Flash Drives – Pros & Cons

- Cons – Mac
  - Keyboard USB ports are USB 1.1, own a USB 2.0 flash drive and a late model Mac other than a G5 and you will need to use an extension cable for easy connection
  - Depending on the type of drive, age of hardware, & age of OS, additional drivers may be required
  - Depending on the hardware and OS finding compatible USB 1.1 or USB 2.0 expansion card will require research

USB Flash Drives – More Info

- http://www.macos.utah.edu
  - Documentation section
  - USB Flash Drives Overview
  - More information and Links to related sites

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Question & Answer

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Next Up

TechTool Pro 4.x Overview

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