Backups and Storage
Or
Burning Down The House

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Backups and Storage

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30 odd years in IT
Strategic savant
IT Hero (You can be one, too)

I spend a great deal of time thinking about sane scenarios for backup in SMB spaces.

In my free time.... Wait, what??

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GD

Steve Spangler SCIENCE
MAKING SCIENCE FUN!


msnbc.com


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FOR FORK LIFTS
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Saturday
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Agenda

- What is a backup?
- Storage mediums
- Storage Systems
  - Local and DAS
  - Network Storage
    - iSCSI, Fiber
- Solutions
- What's Coming?

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What is Backup

- A backup is a COPY on a physically separate storage medium.

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Examples

- USB keychain
- Another Drive (HDD, SSD etc.)
- A NAS
- The Cloud

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Storage Mediums

- Hard Drive - Spinning Rust
- SSD(Solid State Drive) - No Moving parts
- Hybrid Drive - Uses Hard Drive with Flash in the same case
- Fusion Drive - Uses separate HDD and SSD
- Tape (Yes we still use it)
- FIxed/Optical (Yes this too)

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Storage Systems

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RAID

- RAID Levels:
  - 0 - Striped
  - 1 - Mirrored
  - 5 - Striped w/Parity
  - 6 - Striped w/Double Parity
  - BeyondRAID From Drobo

Is it Backup?

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SoftRAID in OS X

- Disk Utility
  - Striped, Mirrored and Concatenated (JBOD)
- In 10.8+, it can be a boot volume
  (but without a recovery partition, still)

Is it Backup?

SAN

- Block level based network storage - it is storage FOR a server.
- One large SAN can be shared to multiple servers for storage.
- Web based administration

Is it Backup?

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Lets talk about it...

- Automate it!
- Replicate it!
- Deduplicate it!

Da Rules

3-2-1

- 3 copies of each important file,
- 2 different media (disk, tape),
- 1 copy stored in another location.

Trust but verify

- No one needs a backup... Until they do
  - Restore files
  - Regularly
  - Should be policy driven

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Nuts and bolts

- CrashPlan
- Mozy
- Retospect (tape archive compatible)

A Solution?

- You need a tired approach
  - Multiple destinations
  - Near line
  - Far Line
- Minimal or no user effort
  - Look for solutions that are focused on ease of deployment
  - Look for solutions that make file level restore easy for end users

Two Tier End Point

- Near line
  - MacPro
  - Gigabit Switch
  - Drobo (several options)
    - CrashPlan deployed to clients and MacPro
- Far Line
  - CrashPlan Cloud account

Network Storage

- Network Storage appliance NAS/SAN
  - NAS - Network Attached Storage
  - SAN - Storage Attached Network
- Some products are both.
- Network limitations - single network port, link aggregation.
- Might not be appropriate solution.

Private Cloud

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drobo

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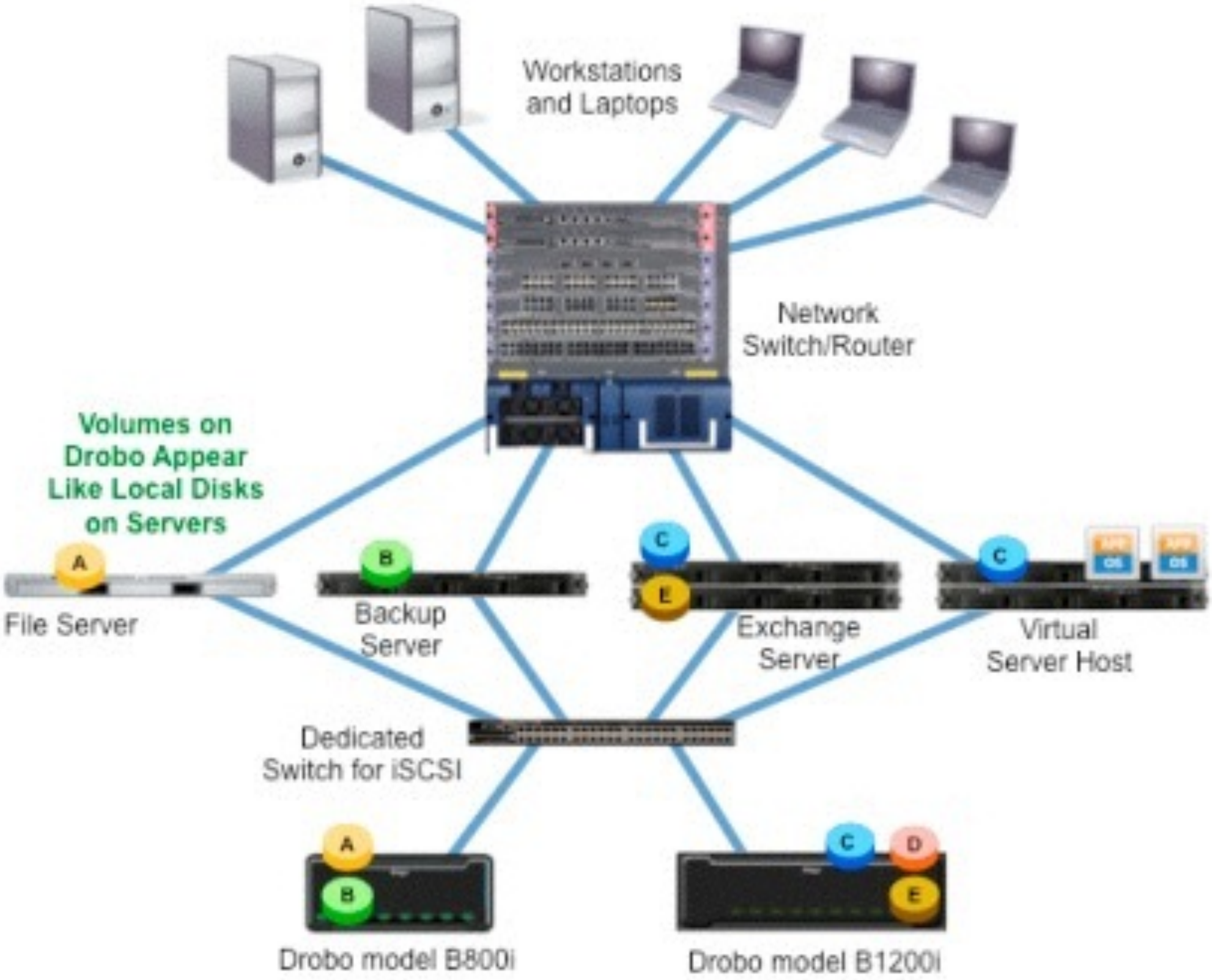

Workstations
and Laptops
Network
Switch/Router
Volumes on
Drobo Appear
Like Local Disks
on Servers
A
File Server
B
Backup
Server
C
E
Exchange
Server
C
Virtual
Server Host
Dedicated
Switch for iSCSI
A
B
Drobo model B800i
C
D
E
Drobo model B1200i

CRASHPLANPRO*e*

Admin Admin

Sign Out

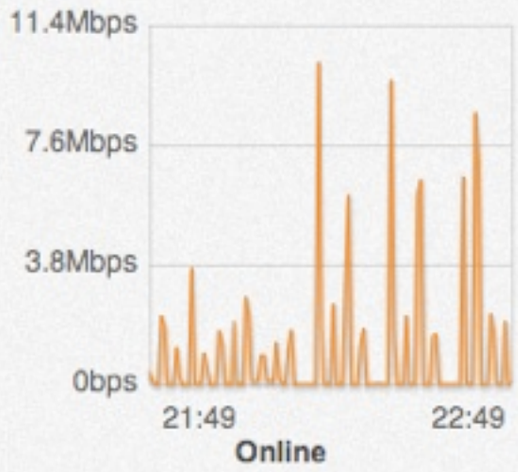
Smart Search

- Dashboard
- Alerts 2 3
- Organizations
- Users
- Devices
- Destinations
- Settings
- Licensing
- My Profile

28
Online Devices

3.3
Kbps Inbound

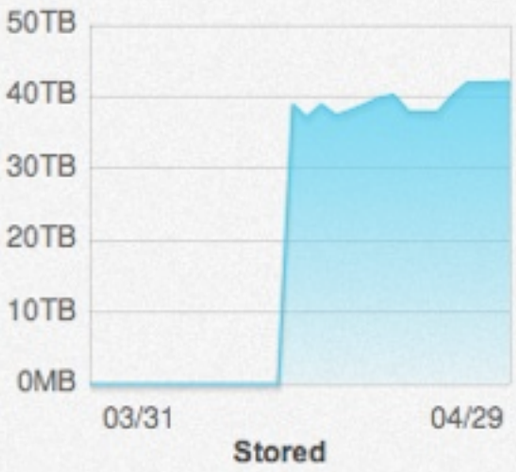
1.4
Kbps Outbound



41.1
TB Stored

92.4
TB Selected

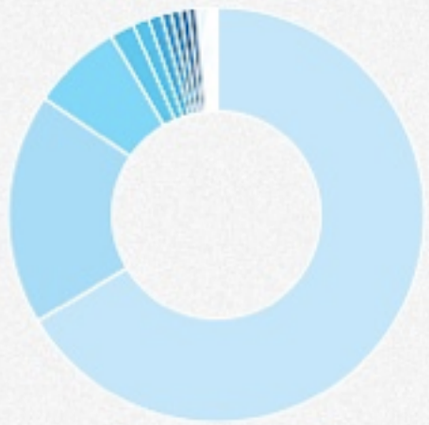
45.5
TB Remaining



27
Licensed Users

1.5
TB Stored/User

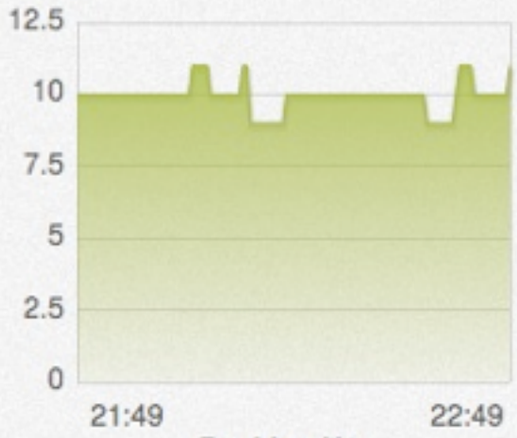
26
Devices with Backup



11
Devices

0.5
Avg/User

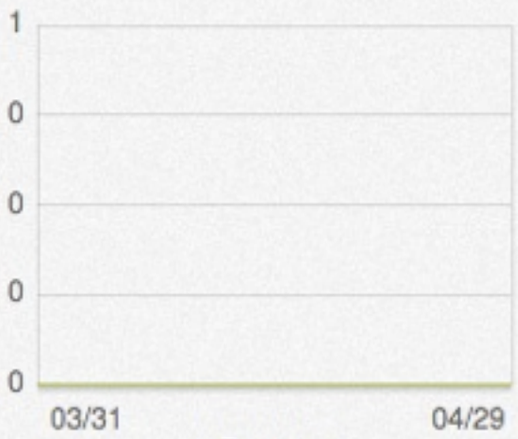
0.4
Avg/Dev



0
Last 30 Days

0
Files Restored

0
MB Restored



262
Support Days Left

27
Licensed Users

30
Total User Licenses

Display a menu

CRASHPLANPRO*e*

Admin Admin

Sign Out

Smart Search

- Dashboard
- Alerts 2 3
- Organizations
- Users
- Devices
- Destinations
  - Overview
  - Servers
  - Store Points
- Settings
- Licensing

Server Overview

Name ▲	Destination	Sessions	Devices	Stored	Free
Backup Depot 1	Backup D...	4	25	9.5TB	17.3TB
Backup Depot 2	Backup D...	4	26	14.1TB	711.2GB
Backup Depot 3	Backup D...	2	26	17.5TB	56.7TB
SSI CrashPlan ...	SSI Crash...	0	0	0MB	404.1GB

play a menu

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Admin Admin

Sign Out

Smart Search

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Device Overview

	Nam	OS	Selected	Progress	Stored	Last Activity		Restore
	Higg		881GB	100%	2.9TB	12 minutes		
	Jeff's		202.7GB	69.3%	764.9GB	1.8 days		
	Joy I		0MB	100%	4.4GB	39.3 days		
	Laur		22.6GB	100%	64.4GB	8 minutes		
	Lisa'		206.4GB	61.9%	287.2GB	7.7 hours		
	MYC		5GB	100%	11.8GB	4 minutes		
	Prod		5.1GB	100%	14.1GB	6.1 hours		
	Rene		147.1GB	99.4%	305.1GB	19.8 hours		
	Shav		147.9GB	81%	501.5GB	8.3 days		
	Stev		194.8GB	36.9%	419.5GB	5.2 days		

Display a menu

CrashPlan PROe

CRASHPLANPRO e

- Backup
- Restore
- Settings
- History
- Destinations

Destinations

Backup Depot 2
Backup running — 2.1 days remaining

Backup Depot 3
Destination unavailable — backup location is not accessible

To do: 18,451 files (22.3GB)
Completed: 401,773 files (63.2GB)
Last backup: 5.2 days ago

Backup Depot 1

Start Backup

Files

Users > craig

420,144 files 85.5GB

Change...

Total: 420,144 files / 85.5GB

CrashPlan PROe

CRASHPLANPRO e

- Backup
- Restore
- Settings
- History
- Destinations

Restore files for computer: CriagsThunAir (this computer)

From backup destination: Backup Depot 2 24% (4 minutes ago)

Find files to restore by name or select from list below:

Name	Size	Last Backed Up
Macintosh HD		3/19/14 7:40 AM
Users		3/19/14 7:40 AM
craig		4/28/14 1:24 PM
Applications		2/20/14 1:57 PM
Cleanup		2/22/14 9:01 PM
Desktop		4/29/14 6:32 AM
Documents		3/19/14 1:26 PM
Downloads		4/26/14 9:01 PM
Dropbox		4/26/14 8:05 PM
Google Drive		4/29/14 5:04 AM

Show hidden files Shc

Restore the most recent version with original permissions to Desktop and rename any

Restore Status

From Backup Depot 1
About Stacks.pdf

Restored to Desktop at 11/14/11 9:15 PM.

What about servers?

- A challenge in the SMB space
  - Bandwidth is the biggest issue
  - Databases need to be stopped or dumped to back them up
- rsync is your friend
  - most hosting companies can help
- A little plug to learn a bit of scripting

Backing up a SAN

- Retospect
- Secondary RAID
  - For Near Line
  - Tape for archive and off site storage
- Can be cumbersome
- Long restore times for disaster recovery

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Ready
Clean
Attention
Error
Cancel
Enter
Previous
Next
HP
StorageWorks
1/8 G2 Tape
Autoloader

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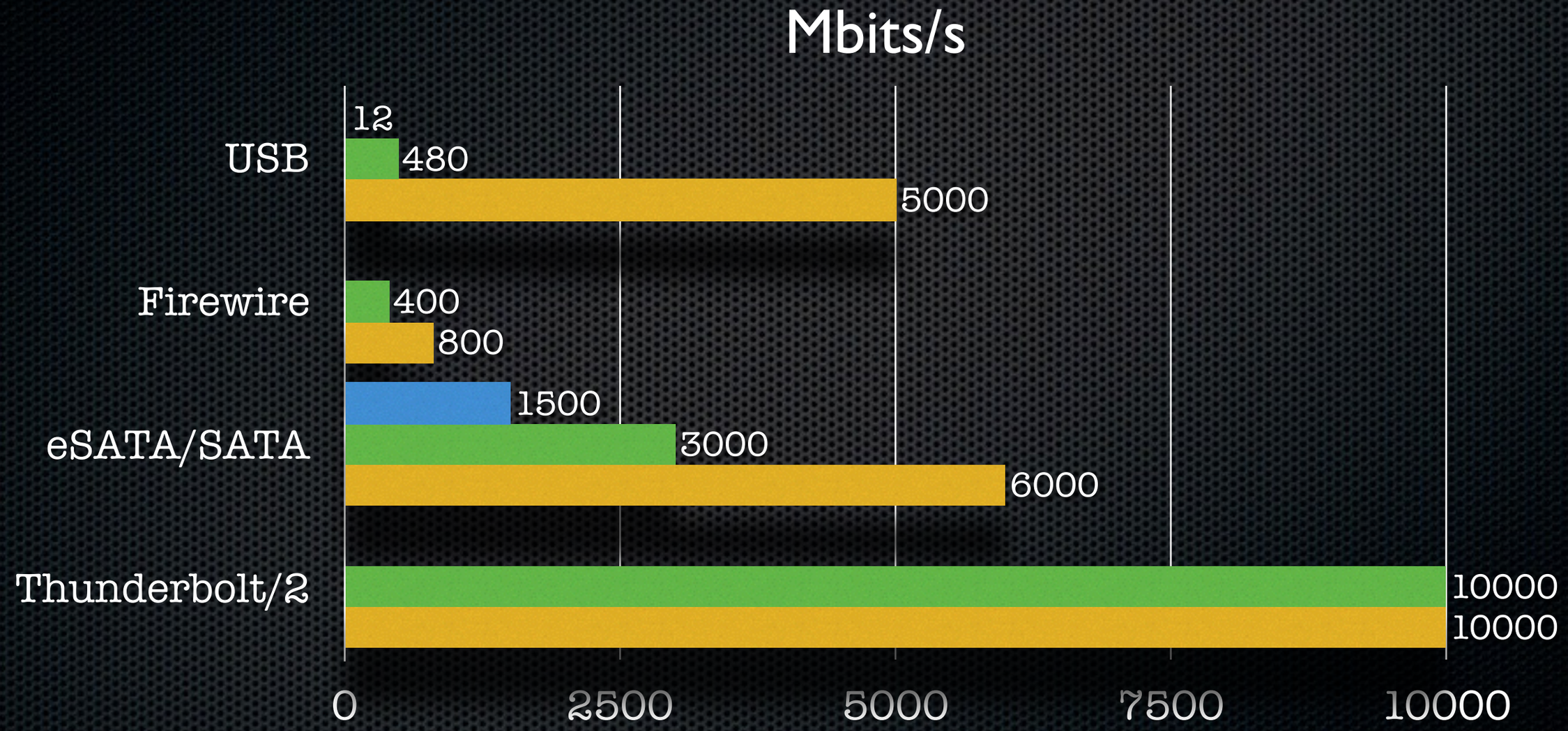
Bus Speeds & Performance



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What's Coming Next?

- Faster storage:
  - Mac Mini Server HD - **100MBps**
  - SATA SSD drive - **550MBps**
  - Macbook Air SSD drive - **800MBps**
  - Mac Pro SSD Drive - **1.2GBps**
- Faster Networking:
  - 1Gbe - **125MBps** Duplexed **250MBps**
  - 10Gbe - **1.25GBps** Duplexed **2.5GBps**

Backups

- Constructing a safe and sane backup plan that allows your customers to recover from likely threats to their ‘working’ data:
  - accidental deletion
  - intentional deletion (mal intent)
  - hardware failure
  - software corruption
  - natural disaster, fire, flood

Backups (cont'd)

- Using unproven third party File Servers, or NAS devices as network Time Machine destinations
- Offering BackBlaze, Carbonite, MozyPRO, Dolly or other Cloud services
- Enterprise capabilities: CrashPlan, Druva, Retrospect, Archiware, etc...

Backups (cont'd)

- Clone utilities
  - Carbon Copy Cloner
  - SuperDuper!
  - Disk Utility
- Using other backup utilities
- The importance of "off-site" storage in a disaster recovery scenario.

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Live Databases: Special Case Backups

- Examples: FileMaker, MySQL
- Use scripts for those

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But they use DropBox!

- Sync is NOT backup (But it's a start)
- Google
- Microsoft

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Sync: Is it a backup?

- Google Drive, Sky Drive, Dropbox, and cloud services like them are great.
- There primary function is synchronization and collaboration.
- Not truly built for restoration, but can definitely be part of the equation.

Archive: Is it a backup?

- DMG: Great for storing files in one enclosure for long period of time.
- Archive: Great for quickly collecting a set of files and keeping them all together.
- Not a backup, but part of the equation.

Things to think about

- Manual backup vs. Automated backup
- Distributed data set backup
- Full vs. incremental vs. differential backup
- Disk Encryption: How it impacts backups
- Encryption in backups:
  - To the cloud and In the cloud
  - Protected disk images
  - External hardware encrypted volumes and thumb drives

Questions?

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