Backups and Storage

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Mike has been supporting Macs for over 27 years and for the last 16, running a small business IT consulting company.

After much research and data analysis he has determined that 100% of his client base, and likely yours, is... human.

To Err is human. To backup data is divine
Pete Simon

Mike believes that it is best to rely on computers to do the backups and for humans to stay out of the way.

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Outline

- Local Storage
- Network Storage
- What's Coming Next?
- Backups (You have them, right?)

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Storage Nomenclature

- Hard Drive - Uses Magnetic Platters
- SSD(Solid State Drive) - Uses Flash Memory
- Hybrid Drive - Uses Hard Drive with Flash
- Fusion Drive - Uses Hard Drive and SSD

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RAID

- RAID Levels:
  - 0 - Striped
  - 1 - Mirrored
  - 5 - Striped w/Parity
  - 6 - Striped w/Double Parity
  - 10 - Mirrored + Striping

RAID is not, however... a backup!

Software RAID in OS X

- Disk Utility
  - Striped, Mirrored and Concatenated (JBOD)
  - In 10.8, it can be a boot volume
    (but without a recovery partition)
- SoftRAID
  - Automatic rebuilds
  - Automatic email notifications of problems

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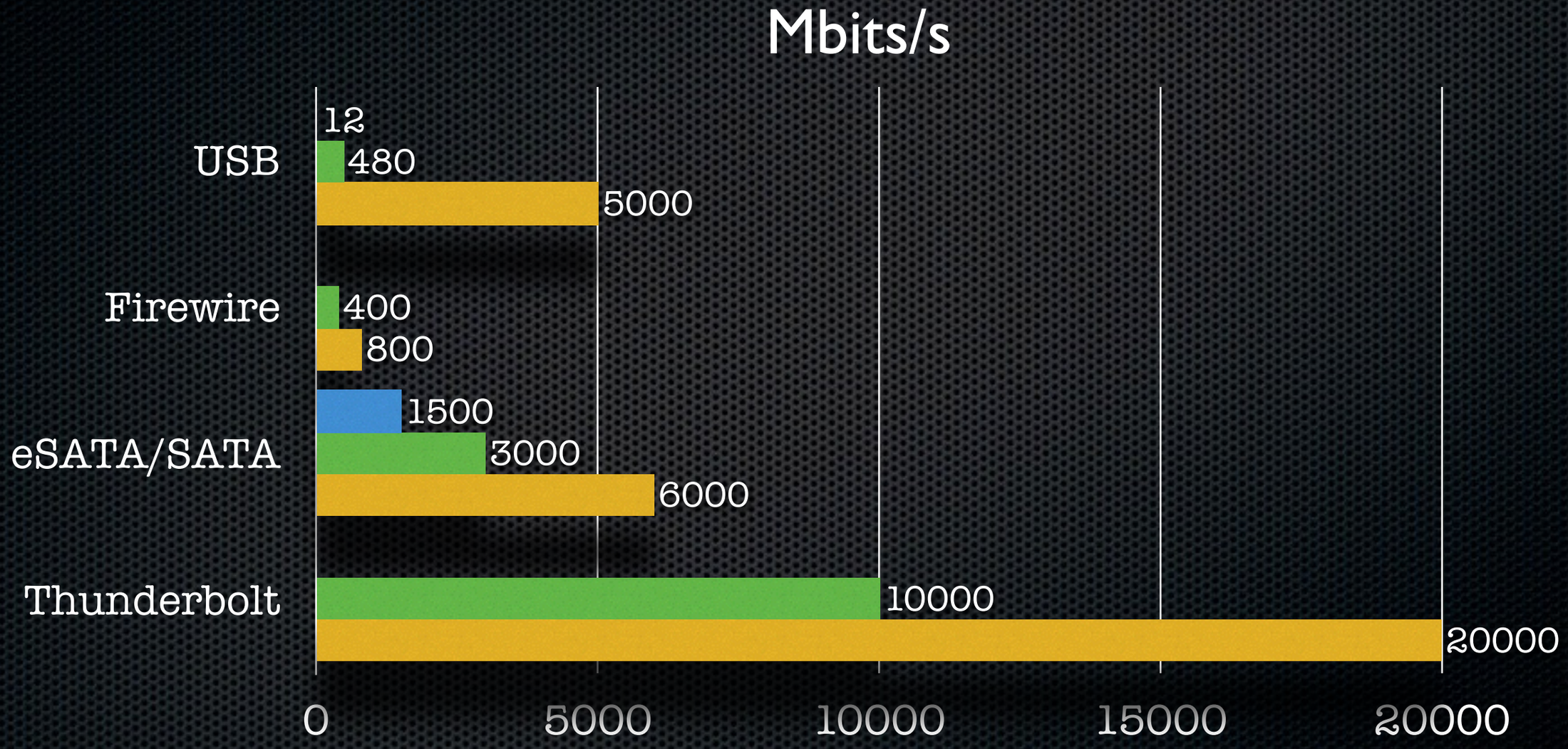
Bus Speeds & Performance



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Local Storage: Classic approach

- Internal boot and storage. i.e. Mac Pro Server.
  - Big
  - Expensive
  - Powerful
  - Limited Storage (limited to 4 internal drives and RAID card)

Local Storage: modern approach

- Internal boot and external storage.
  i.e., Mac Mini + external RAID.
  - Fast Storage with Thunderbolt
  - Potentially Underpowered CPU
  - External Connections
  - Difficult to replace internal hard drives
  - Limited Internal Storage (2 internal drives)
  - Potentially slow network connection

Network Storage

- NAS - Network Attached Storage
  - Single storage device that operates on data files
  - Uses Ethernet and TCP/IP connections
  - Network limitations - single network port, link aggregation.
  - Not always an appropriate solution.

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Synology DiskStation - [redacted]

https [redacted]

Reader

File Statio

DSM Help

Control Panel

Search

File Sharing and Privileges

Win/Mac/NFS | FTP | WebDAV | User | Group | Shared Folder | Directory Service

Network Services

Web Services | DDNS | QuickConnect | Router Configuration | Firewall and QoS | Auto Block | Terminal | SNMP

System

Network | DSM Settings | Regional Options | Notification | Hardware | Devices and Printers | Bluetooth | Restore Defaults | DSM Update

Application Settings

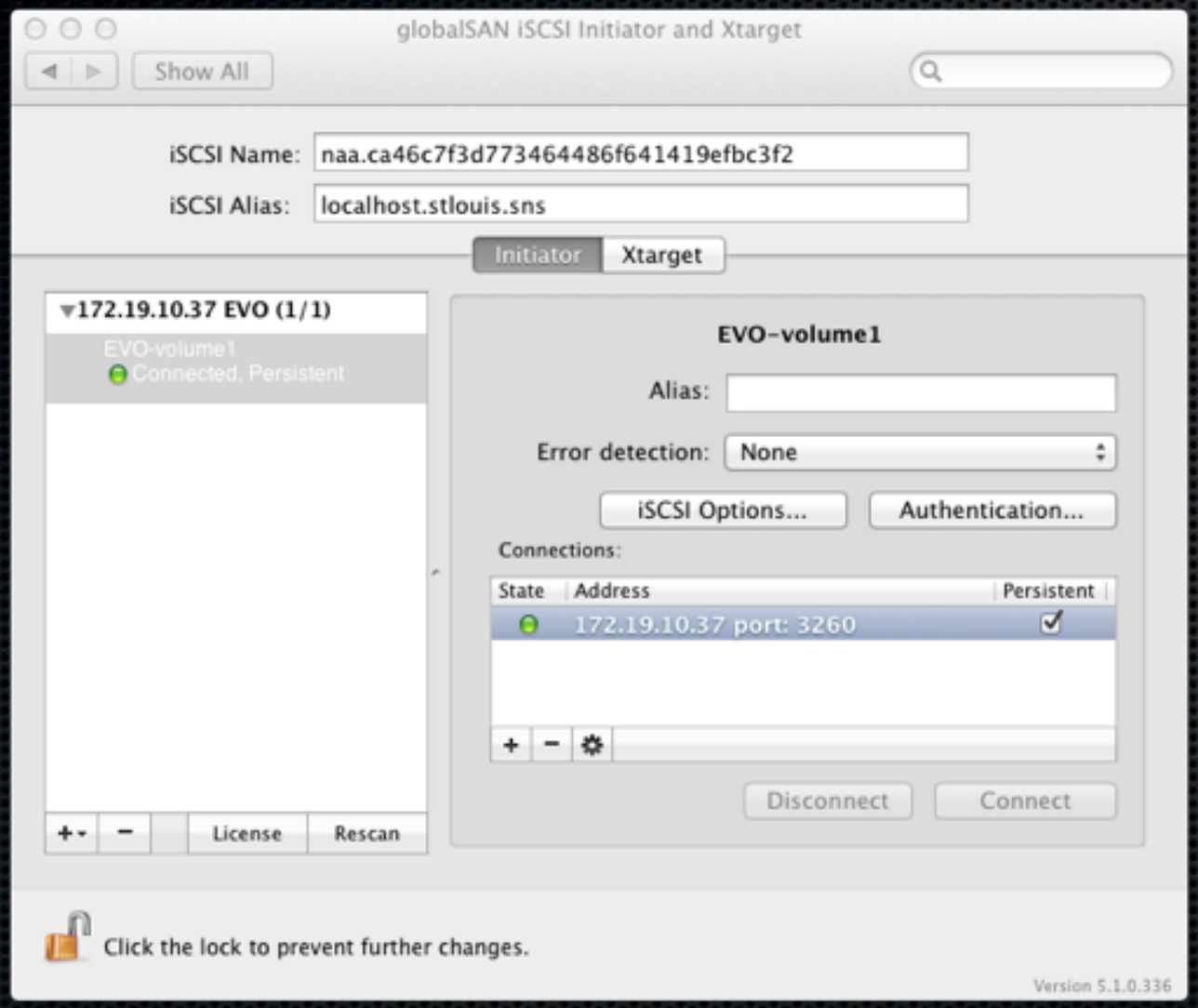
Application Privileges | Application Portal | Syslog | VPN | Media Indexing Service | Network Backup | Task Scheduler

Synology DSM 4.2

SAN

- SAN - Storage Area Network
  - Block level based network storage - it is storage FOR a server.
  - One large SAN can be shared to multiple servers for storage.
  - Uses Fiber Channel interconnects
  - Web based administration
  - Some products are both

iSCSI



- Allows you to connect a network volume as if it was local.
- Transmits SCSI commands over IP networks

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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**
  - **10Gbe - Thunderbolt over Ethernet**

Backups

- Construct 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 and theft

Backups (cont'd)

- Use Mac OS X File Servers, or NAS devices as network Time Machine destinations
- Offer CrashPlan Pro, Carbonite, MozyPRO, Dolly or other Cloud services
- Enterprise capabilities: CrashPlan ProE, Druva, Retrospect, Archiware, etc...

Backups (cont'd)

- Clone utilities
  - Carbon Copy Cloner
  - SuperDuper!
  - Disk Utility
- Chronosync or Tri-Backup
- "Off-site" storage in a disaster recovery scenario is a requirement.
  - Don't forget to take into account upload speed for offsite backups.

Sanity Check

- 1. Single backup is not enough
- 2. Never trust any one system
- 3. Be paranoid
- 4. Prepare for the worst
- 5. Ask dumb questions
- 6. Test. Restore. Test.
- 7. Investigate
- 8. Be paranoid

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Islands of Doom

- Where's your stuff?
- "My stuff is here."
- "There."
- "Everywhere!"
- "Okay, I don't know where my stuff is!"

Islands of Doom

- No backup
- I guess your stuff is not very important then?
- No disaster plan
- No more business
- You just can just redo it all? No problem!

The Rules

- 1.Automatic backup process
- 2.Multiple stages/copies
- 3.Include all required files for production and business
- 4.Change media/technology (disk/tape/cloud)
- 5.Relocate/Off-site storage
- 6.Test the restore process

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3-2-1 Rule

- Might be the easiest to remember:
  - 3 copies of each important file,
  - 2 different media (disk, tape, cloud)
  - 1 copy stored in another location.

Live Databases: Special Case Backups

- Examples:
  - FileMaker
  - MySQL
  - PostgreSQL
- Use scripts for those
- Backup the backups

Special Case: Virtual Machines

- Virtual Machines:
  - Linux
  - Windows
  - OS X
- Veeam, Backup Exec etc
- Snapshots vs Backups

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Sync: Is it a backup?

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

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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.

First Published: 19:36 IST(29/8/2011)
Last Updated: 19:38 IST(29/8/2011)

Branson loses autobiography in blaze

Airline tycoon Richard Branson has lost his autobiography and 15 years of handwritten notes after his British Virgin Islands house caught fire.

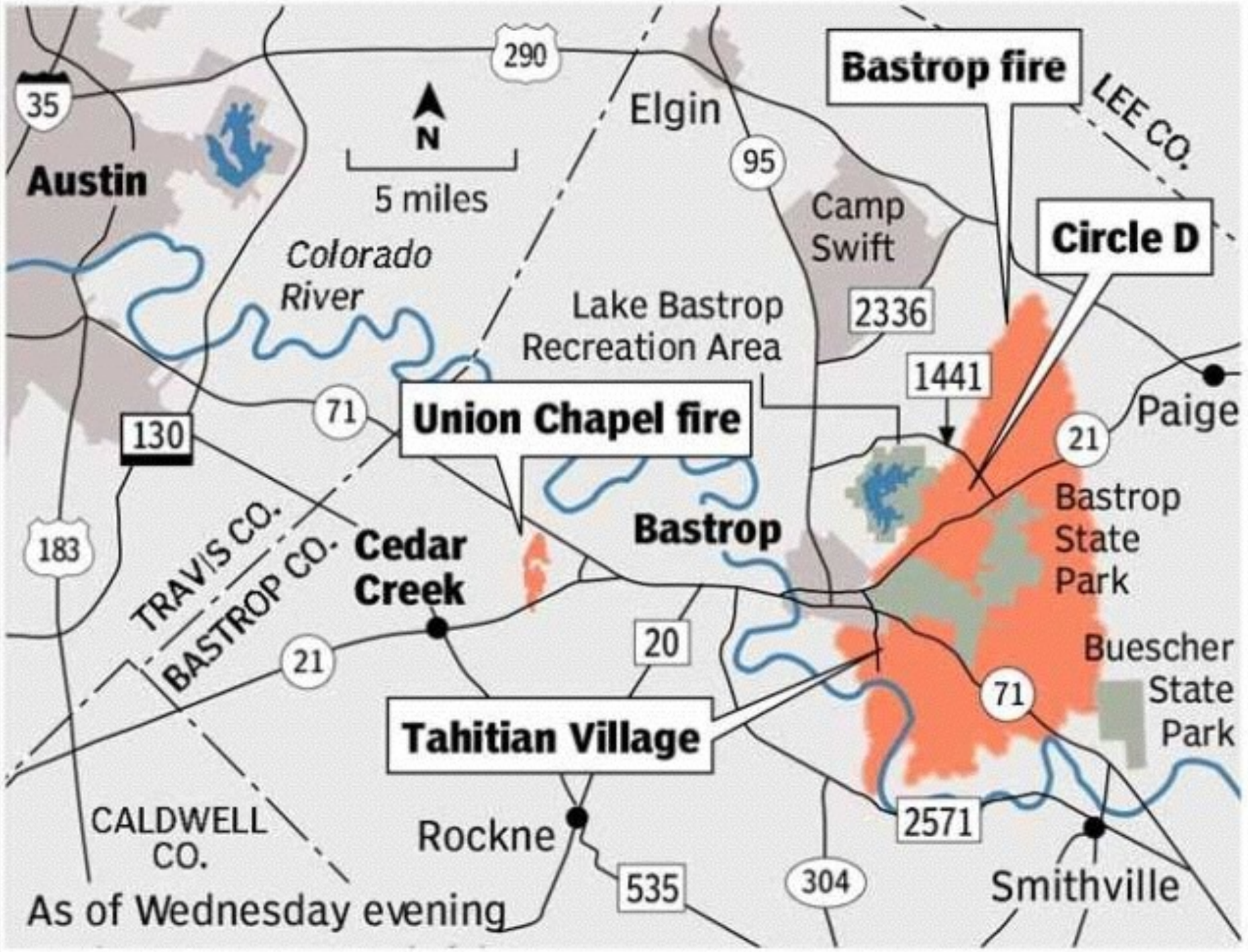
Actress Kate Winslet and 20 other guests were holidaying at the billionaire's home when lightening hit the wooden property and set it ablaze, reports contactmusic.com.

"My office was in the house and I lost everything in it. I'd got a long way into writing my autobiography and it's lost. Fifteen years of handwritten notebooks went and photographs and so on," Branson told Britain's The Sunday Times.

"Running a business, we have a meticulous computer backup system so I'd assumed all that was completely safe. But it turns out the backup was also in the house.

"Everything filed on the computers there in the past few years is lost, both business-related and personal... But these are things. And as long as you have your family and friends around you, they're not that important," he added.

Bastrop County wildfires



Source: Bastrop County Office of Emergency Management

AMERICAN-STATESMAN

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

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Things to think about

- Recovery time
- Upload speeds for cloud backups
- Cloned data vs Proprietary backup formats
- Make sure OS Drive is backed up, not just data
- What analog items need to be converted to digital and then backed up.

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The real test

- Regardless of which tools / approaches you suggest to your client, implore them to run (or have you run) fire-drill type restore tests, for both their protection and yours.

Questions?

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