



**BackupAssist**<sup>TM</sup>  
Windows® Backup Made Easy!

# BackupAssist v5

Combining Drive Imaging, Data Archival Backup and  
Internet Backup

Your presenter:

**Linus Chang, Lead Developer of BackupAssist**

Our last SBS UG presentation was in 2005



BackupAssist™  
Windows® Backup Made Easy!


## ■ What we used to do...



# A lot has happened since!

## ■ But today...





## The Complete Backup Toolkit for SMB

- Centralized Monitoring
- Drive Imaging
- File Replication
- Internet Backup
- SQL and Exchange

- Technology overview – sweet spots

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- Technology deep dive
  - ▣ Server 2008 Drive Imaging – the good, bad & ugly
  - ▣ New techniques for data archival backup
  - ▣ Internet offsite backup

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- Putting it altogether
  - ▣ Example setup that protects the client & is profitable for I.T. specialist
  - ▣ Centralized monitoring

- Technology view: which method do you use?
  - Drive Imaging
  - File Backup
  - Internet Backup
  
- Each method has a sweet spot!
  - This presentation is about understanding each tool, and using the right tool for the right job

- Consider a set of golf clubs:
  - ▣ Different clubs designed to achieve different things
  - ▣ Drive imaging is like the 1 Wood of clubs – maximum power, furthest distance from the tee
  - ▣ BUT if you're in a sand trap, you need a different tool to get out. A 1 Wood won't help!
  - ▣ This presentation is about understanding the different tools and learning to use them appropriately



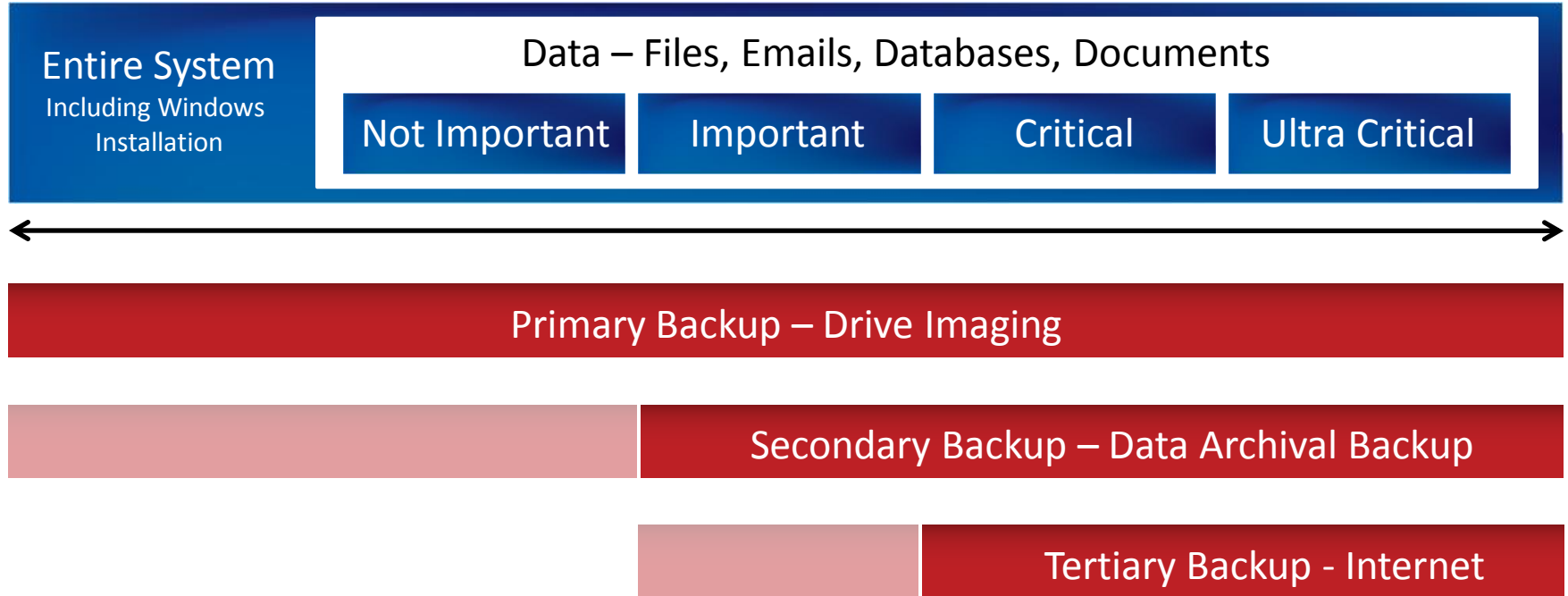
# Causes of data loss

## ■ Situations you might find yourself in...

<b>Server Problem</b>	Server hard drive or RAID goes down Server motherboard failure Server stolen	<i>Drive Imaging for server recovery</i>
<b>Data Problem</b>	User sabotage, deletion over several months Application “craps” itself and destroys data User deletes data; undetected for months	<i>File &amp; App Backup for data recovery and version history</i>
<b>Natural Disaster</b>	Local disasters – such as office fire, office flood Massive disasters – such as Hurricane Katrina, bushfires, earthquakes, floods	<i>Internet Backup for geographical separation</i>

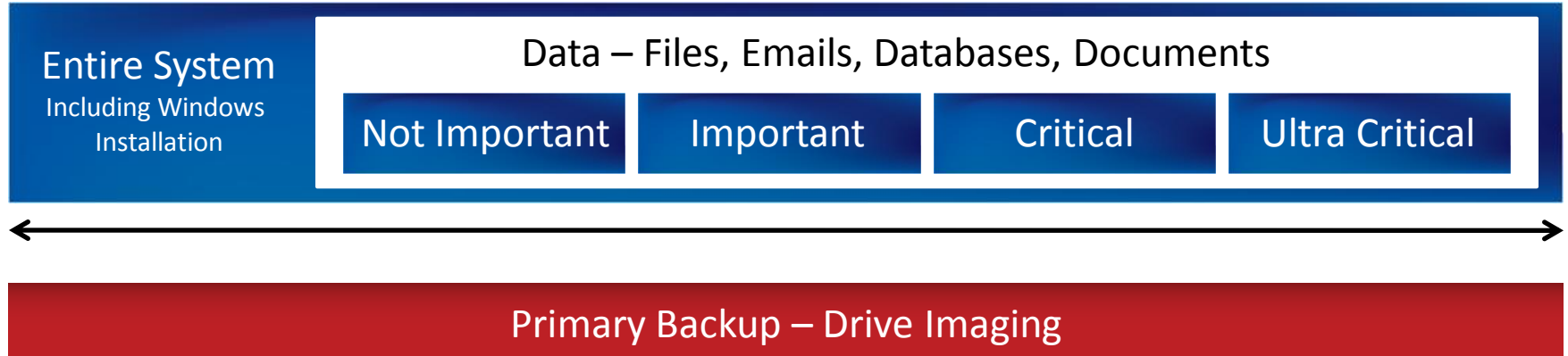


# Multiple layers of protection



This is our model that is flexible and can be tailored to suit the situation. We'll talk about this later – but firstly, let's deep dive into each technology and understand it thoroughly.

# Primary Backup



## Primary Backup

objective is fast server recovery

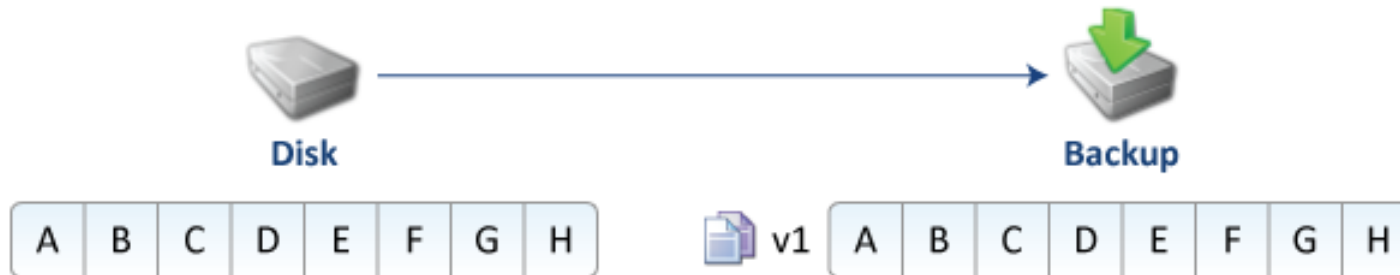
## ■ Highlights:

- Fast recovery – boot from CD to start restore
- VSS Aware
- Automatic disk management
- Fast differential images
- Built into the Operating System

## ■ Lowlights:

- Technology limitations, poor usability, management and reporting

## ■ How it works – first backup



### Monday's Backup

- No previous backups on this disk
- Full backup performed on Monday

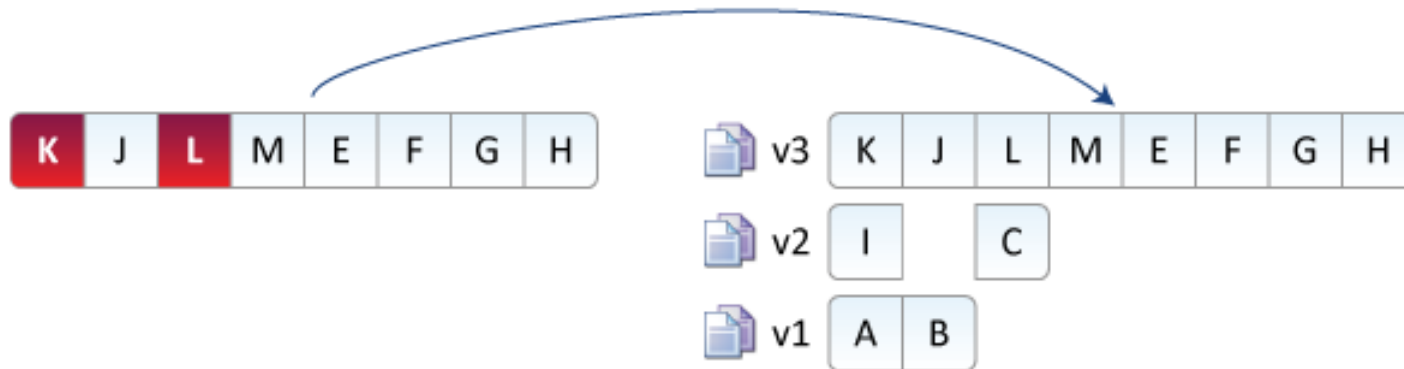
## ■ How it works – second backup



### Tuesday's Backup

- Blocks I and J are modified
- Blocks I and J are transferred to form the new full backup for Tuesday
- Blocks A and B are stored as Monday's version

## ■ How it works – third backup



### Wednesday's Backup

- Blocks K and L modified
- Blocks K and L are transferred to form a new full backup for Wednesday
- Blocks I and C are stored as Tuesday's version
- Blocks A and B are stored as Monday's version

- From our testing, it handles Hardware Independent Restores (HIR)
  - ▣ Physical to physical (P2P)
    - Intel Xeon Dual Processor Dual Core Server
      - AMD Phenom Single Processor Quad Core Desktop
    - Acer Laptop → AMD Sempron Desktop
  - ▣ Physical to virtual to physical (P2V, V2P) using VMWare Server
    - AMD Phenom Quad Core → VM on AMD Sempron Single Core
      - Intel Xeon Dual Proc Dual Core
    - Intel Xeon Dual Proc Dual Core → VM on AMD Sempron Single Core → AMD Phenom Quad Core
- Despite our best efforts, we couldn't actually break it!

- Technological limitations / gotchas of the Windows Backup Engine:
  - Backups are not copyable
  - No Exchange 2007 on Server 2008 support yet...  
Microsoft were meant to have released a plug-in by now!
    - Note: this is included in SBS 2008, just not Server 2008
  - You must restore to a disk of the same size or bigger
  - You are not guaranteed any level of backup history
  - No tape drive support



## ■ Wizard Limitations

- Wizards are built-into Server 2008 and SBS 2008
- Unfortunately there are many limitations in the wizards that limit their usefulness

## ■ Enter BackupAssist

- Just like we added scheduling, management and reporting features for NTBackup, so too we do it for Windows Server Backup, so it's as reliable as other imaging products that cost thousands of dollars.

# How BackupAssist “fixes” WSB



## ■ General features

Feature	Server 2008 Wizard	SBS 2008 Wizard	BackupAssist
Easy setup and scheduling	✓	✓	✓
Multiple backup jobs	✗	✗	✓
Monitor the backup “live” as it happens	✗	✗	✓
Event log backup result	✓	✓	✓

# How BackupAssist “fixes” WSB



## ■ Hardware support

Feature	Server 2008 Wizard	SBS 2008 Wizard	BackupAssist
Support for USB HDDs	✓	✓	✓
Support for eSata disks	✗	✓	✓
Support for removable disk (rdx, REV)	✗	✗	✓
Support for local disks	✗	✓	✓
Support for NAS	✗	✗	✓
Detect & inject HDDs before backup	✗	✗	✓
Safely eject HDDs after backup	✗	✗	✓

- Note: We have had difficulties with eSata support in the SBS Wizard due to inconsistent motherboard support of AHCI. BackupAssist solves this.

# How BackupAssist “fixes” WSB



## ■ Media rotation & reminders

Feature	Server 2008 Wizard	SBS 2008 Wizard	BackupAssist
<b>Media rotation</b>			
In-built media rotation schemes	✗	✗	✓
<b>Reminder notifications</b>			
Remind operator to insert media	✗	✗	✓
Maintenance messages (eg. perform test restore)	✗	✗	✓

- Note: The built-in wizards do not have predefined media rotation schemes or media checking, so the user is left to his/her own devices! Human error leads to a compromised backup strategy.

# How BackupAssist “fixes” WSB



## ■ Reporting

Feature	Server 2008 Wizard	SBS 2008 Wizard	BackupAssist
Reporting			
Report emailed to administrator	✗	✓	✓
Overall status of backup	✗	✓	✓
Notification if user inserts wrong disk	✗	✗	✓
Detailed log	✗	✗	✓
Media usage report	✗	✗	✓

- Without BackupAssist, you will have no forward warning when you're about to run out of disk space until the backup fails, and no idea what backups are on each disk.

# How BackupAssist “fixes” WSB



## ■ Scripting

Feature	Server 2008 Wizard	SBS 2008 Wizard	BackupAssist
Scripting before / after backup	✗	✗	✓
Run script before backup	✗	✗	✓
Run script unconditionally after backup	✗	✗	✓
Run script if backup succeeded	✗	✗	✓
Run script if backup failed	✗	✗	✓

# Microsoft “wizards” aren’t so magical



## ■ In summary...

Feature	Server 2008 Wizard	SBS 2008 Wizard	BackupAssist
Easy setup and scheduling	✓	✓	✓
Multiple backup jobs	✗	✗	✓
Hardware support			
Support for USB HDDs	✓	✓	✓
Support for eSata disks	✗	✓	✓
Support for removable disk (rdx, REV)	✗	✗	✓
Support for local disks	✗	✓	✓
Support for NAS	✗	✗	✓
Safely eject HDDs after backup	✗	✗	✓
Media rotation			
In-built media rotation schemes	✗	✗	✓
Reminder notifications			
Remind operator to insert media	✗	✗	✓
Maintenance messages (eg. perform test restore)	✗	✗	✓
Reporting			
Report emailed to administrator	✗	✓	✓
Overall status of backup	✗	✓	✓
Notification if user inserts wrong disk	✗	✗	✓
Detailed log	✗	✗	✓
Media usage report	✗	✗	✓
Monitor the backup “live” as it happens	✗	✗	✓
Scripting before / after backup	✗	✗	✓
Run script before backup	✗	✗	✓
Run script unconditionally after backup	✗	✗	✓
Run script if backup succeeded	✗	✗	✓
Run script if backup failed	✗	✗	✓
Event log backup result	✓	✓	✓

# Live monitoring in BackupAssist



## ■ Live monitoring

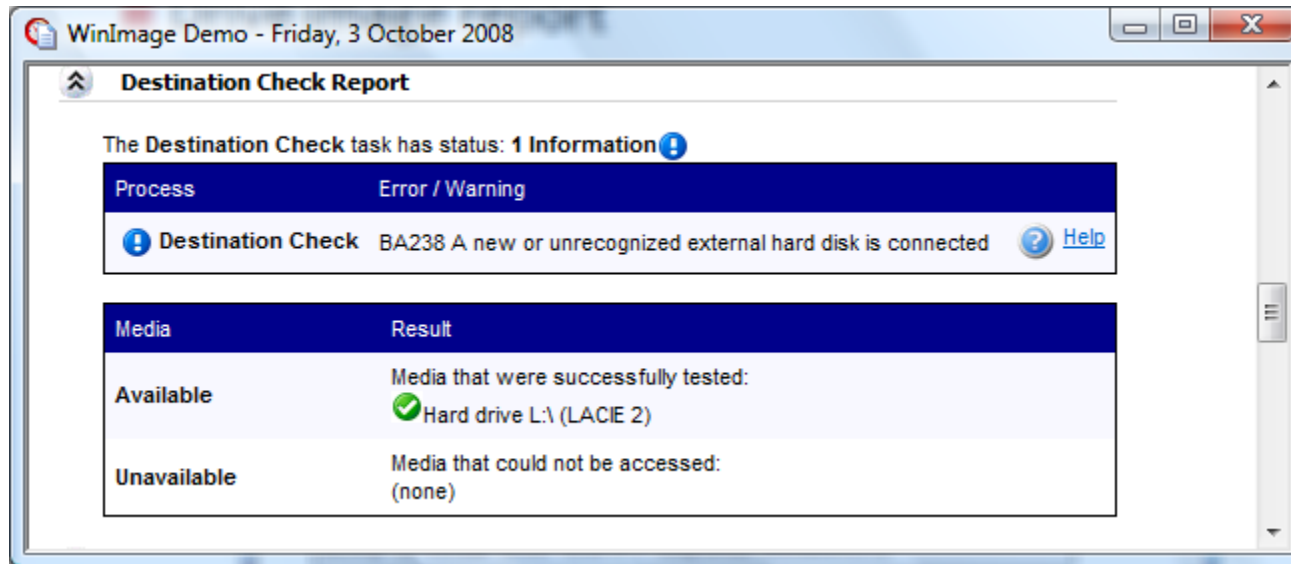
The screenshot displays the BackupAssist 5.0.0d0 application window. The interface includes a menu bar (File, Edit, View, Settings, Help) and a toolbar with icons for Home, Jobs, Monitor, Reports, Events, Restore, and Settings. The main window is divided into several sections:

- Jobs in progress:** A list showing a single job: "WinImage Demo (4/10/2008 5:39:01 AM)".
- Recent jobs:** A list showing three completed jobs, all labeled "WinImage Demo" with their respective start times (4/10/2008 5:30:52 AM, 4/10/2008 4:59:16 AM).
- BackupAssist - Monitor:** The central pane titled "Recent jobs monitor" with the instruction "View running, or recently completed jobs". It displays a detailed view of the selected job, including:
  - Start date & time: 4/10/2008 5:39:03 AM
  - Running time: 0 hours 1 minutes
  - Progress log: A scrollable text area showing the following steps:
    - Retrieving volume information...
    - This would backup volume Local Disk(C:) to L:.
    - Backup to L: is starting.
    - Creating the shadow copy of volumes requested for backup.
    - Running backup of volume Local Disk(C:), copied (100%).
  - Cancel backup button
- Buttons for Refresh and Report.

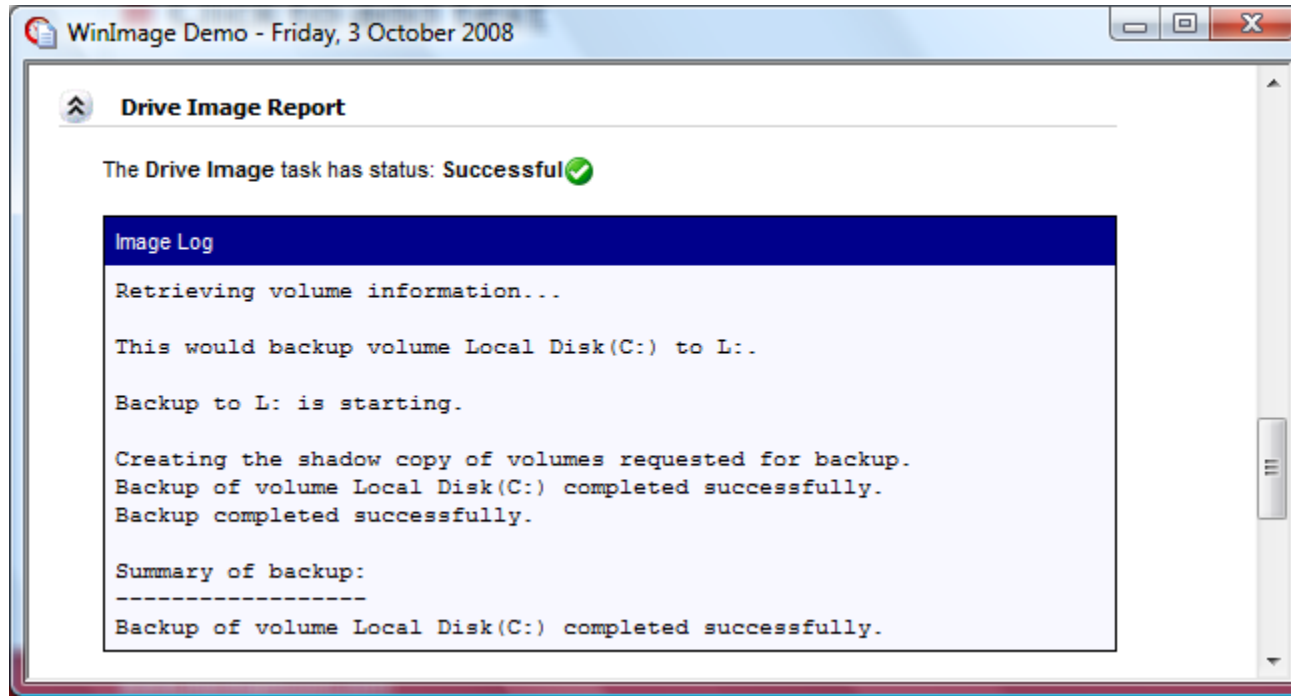
At the bottom of the window, there is a status bar with "Contact support!" on the left, "Trial mode: 30 day(s) left in trial" in the center, and "Purchase online..." on the right.



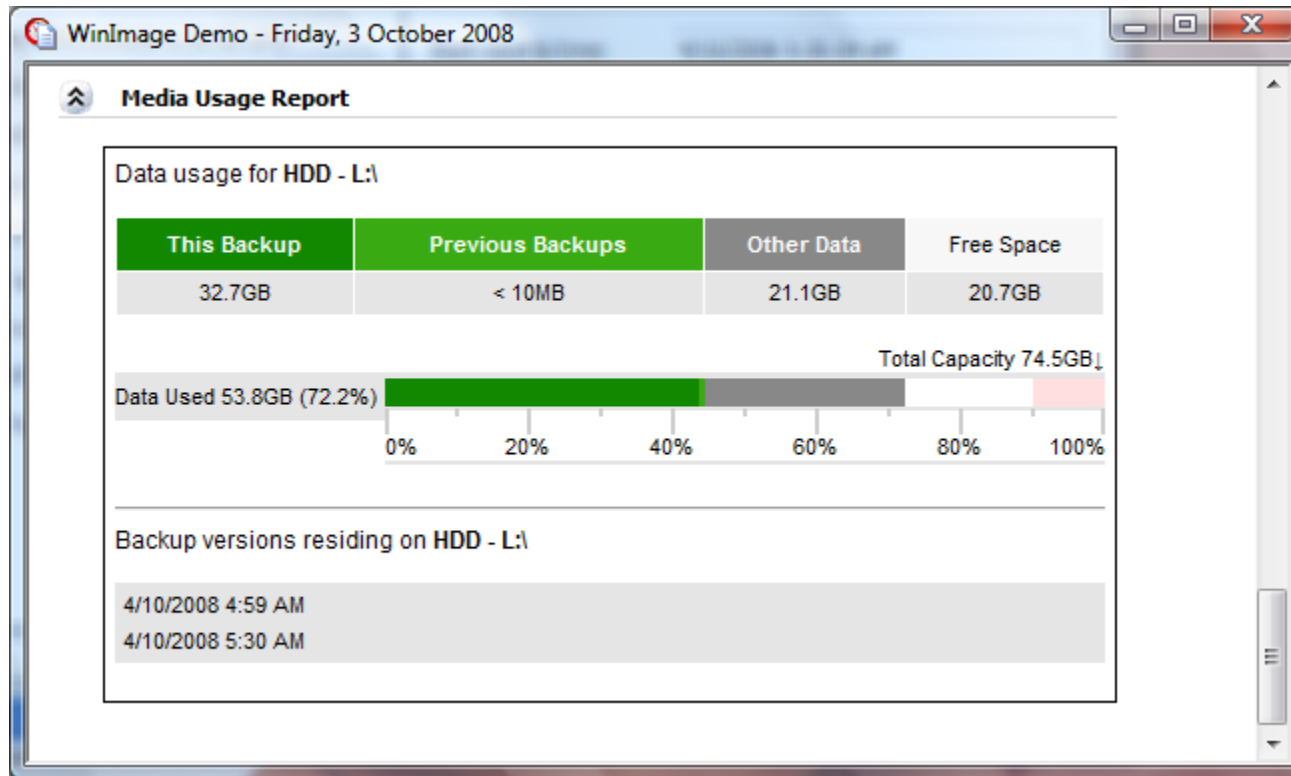
## ■ Destination checking



## ■ Drive image report



## ■ Media usage report:



## Other facts about Windows Server Backup

- Images stored in VHD format
- Tools are available to mount the images
  - ▣ WinMount – works fine
- No “converter” to go straight to a VMware virtual machine. Instead, do a bare metal restore into a skeleton VM
- Backup entire volumes only

New metal server recovery  
Volume backup

Application backup & recovery (VSS)  
File & directory recovery

Backup network files

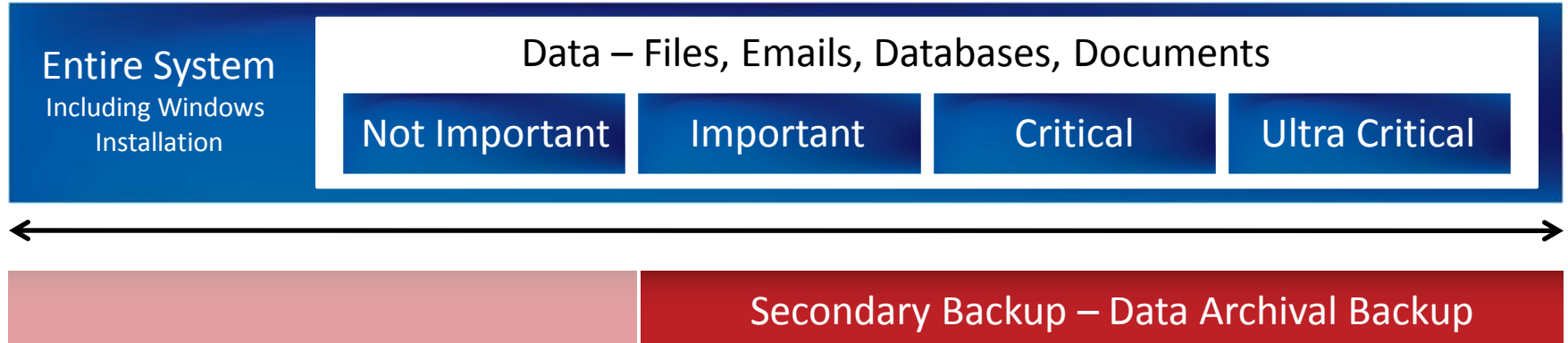
Backup individual files & folders

Archival backup (versioning)

Application aware backup

Internet based backup

# Secondary Backup



Secondary Backup  
objective is data backup & history

# Why file replication?

- Before we begin, why are we providing another method of backing up?
  - ▣ Consider the case of the “rogue employee” – three months ago they started deleting files; they quit last week, and the data loss was only discovered today. What will save your bacon?
    - Drive Imaging backup – no\*
    - Tape backup with GFS scheme – no\*
    - File replication backup – yes!



\* Historical backups are done only at particular intervals (eg. Monthly, weekly) leaving large gaps between successive backups and providing only partial protection. File Replication backups provide daily snapshots of the filesystem for comprehensive data protection.

# Why file replication?



- Having another backup in a different format also gives you more restore options:
  - ▣ If image backup gets corrupted, or fails for any reason, this gives you another alternative for restoring data
  - ▣ Our File Replication Engine far more powerful at file versioning and historical backups than any other backup method.
  - ▣ This extra protection is simple, adds very little overhead, but has numerous benefits. Cost benefit ratio is immense!



# Objective: data archival backup



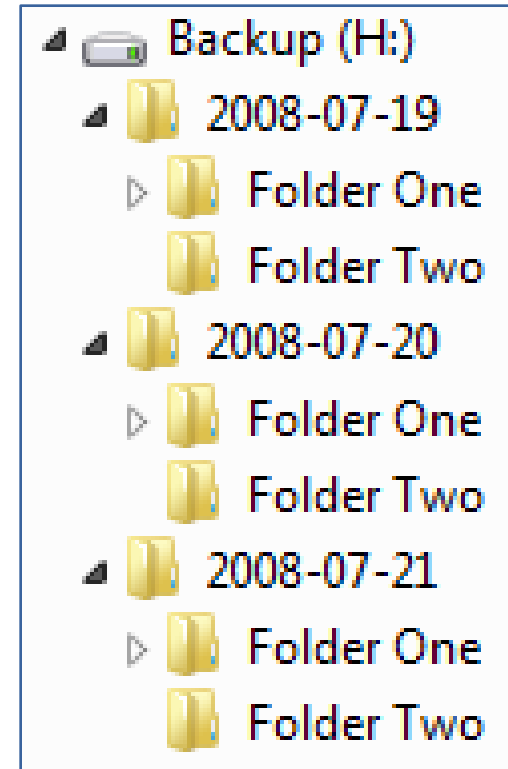
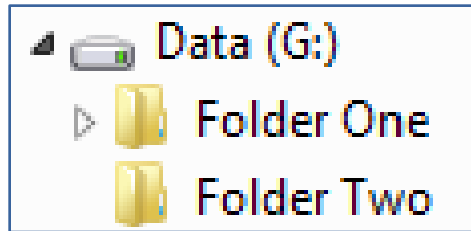
- File Replication Engine
  - ▣ Based on the simplest form of backup: copying files from “A” to “B”.
  - ▣ File-based backup technology that is substantially better than previous “standards” in terms of speed & reliability
  - ▣ Fantastic for backing up data files & maintaining version history that goes back hundreds of days!
  - ▣ Totally transparent Single Instance Store saves space and improves performance
  - ▣ Runs on XP, 2003, Vista & 2008
  - ▣ Exact copy including NTFS security & data streams
  - ▣ The backup is completely non proprietary – simply a file system that can be restored easily without additional software!
  
- Two modes of operation – mirror and backup

## ■ Mode 1 – Simple mirror



- The result on the backup device is an identical copy of the original

## ■ Mode 2 – Backup with history



- The result is a series of mirrors, one each time the backup is run. Each mirror is self-contained & the single instance store works totally transparently!

- This is NEW technology, so a few points to note:
  - ▣ Archive bit is not relevant anymore
    - We don't touch it so it won't interfere with any other backup methods
  - ▣ No such thing as a full, incremental or differential – instead the mode is “Automatic”, where:
    - if a previous backup exists, merge in the changes
    - if no previous backup – do a full backup
  
- Highly efficient transfer
  - ▣ The speed of a differential backup
  - ▣ Each backup looks like a full

- Ticks all the boxes:
  - ▣ Fast differential-speed backups
  - ▣ Each backup looks like a full backup
  - ▣ Simple one-step restore
  - ▣ Non-proprietary format
  - ▣ Backup history – potentially store hundreds of versions
- Also an easy, scheduled, monitored & VSS aware replacement for Robocopy scripts

## ■ Usage scenarios:

### ■ Using portable media

- Direct replacement for NTBackup-to-tape – swap external disks instead



### ■ Using fixed media

- Backup to a NAS or mass storage device every day for automatic protection
- The user doesn't even know it's happening!



- Completely different league of performance  
When compared to traditional file backup methods:

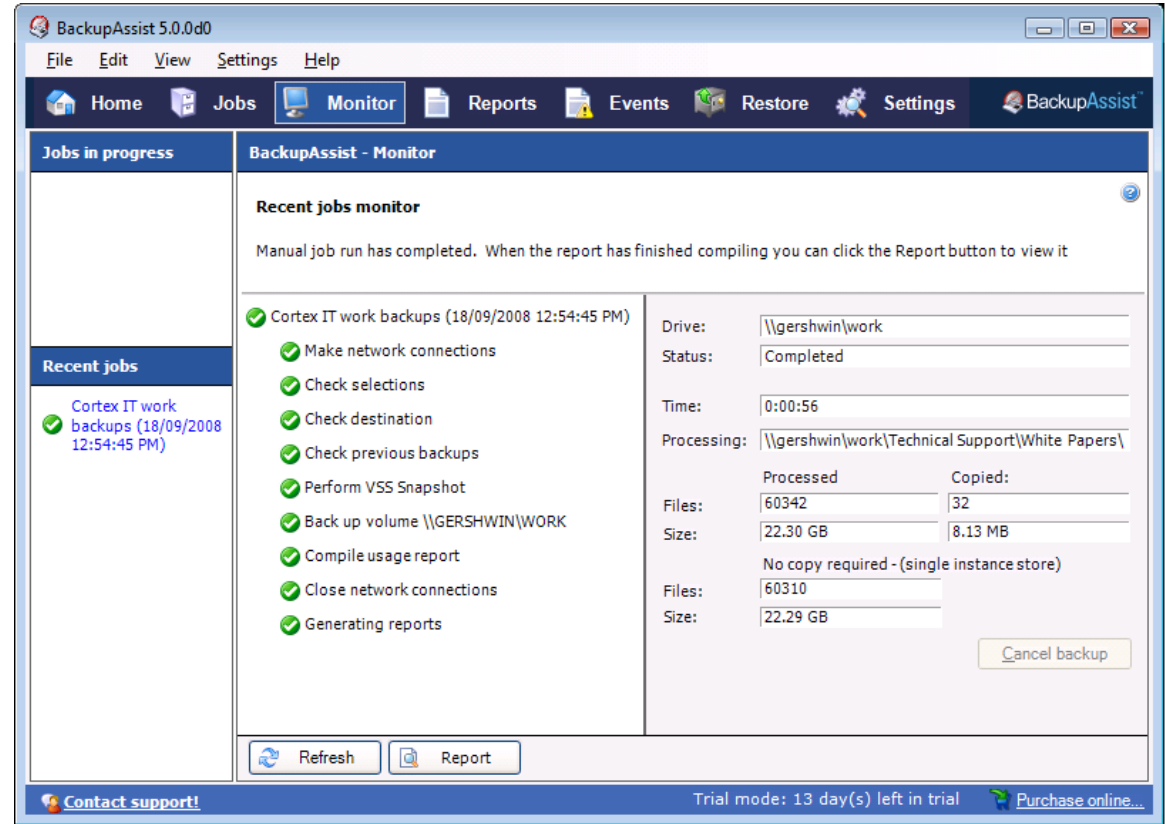
Traditional File Backup (NTBackup, Backup Exec) Full backups every time	BackupAssist File Replication Engine Full backups every time
Every file is transferred every time	Only changed files are transferred <b>Faster</b>
No single instance store	Single instance store <b>Smaller</b>
Small number of backups per backup drive – limited version history	Many backups on each backup drive – extensive version history <b>Better</b>
Restore requires additional software	Restore does not require additional software

- Practical example – our own file system

# File Replication Engine

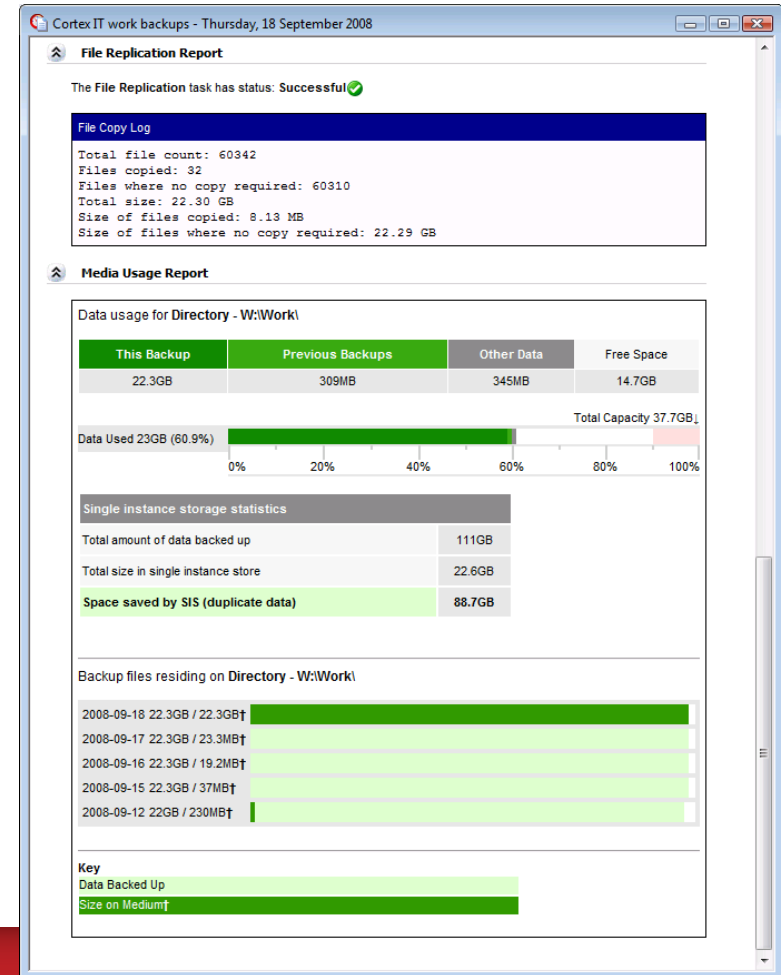


- 22 GB data protected
- 60,000+ files
- Average 5-20 MB changes
- Nightly backup time: Under 2 minutes over Gigabit LAN





- Backup Report:
  - ▣ 22.3GB in last backup
  - ▣ Previous backups average 20-40 MB
  - ▣ Single instance store has saved 88 GB in just 5 backups
  - ▣ Projected 190 days of backup history



CortexIT work backups - Thursday, 18 September 2008

### File Replication Report

The File Replication task has status: **Successful** ✓


#### File Copy Log

Total file count:	60342
Files copied:	32
Files where no copy required:	60310
Total size:	22.30 GB
Size of files copied:	8.13 MB
Size of files where no copy required:	22.29 GB

#### Media Usage Report

Data usage for Directory - W:\Work1


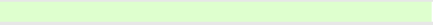
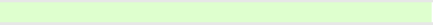
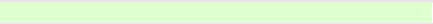
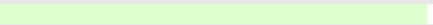
This Backup	Previous Backups	Other Data	Free Space
22.3GB	309MB	345MB	14.7GB

Data Used 23GB (60.9%)  Total Capacity 37.7GB

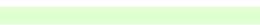

#### Single instance storage statistics

Total amount of data backed up	111GB
Total size in single instance store	22.6GB
Space saved by SIS (duplicate data)	88.7GB

#### Backup files residing on Directory - W:\Work1

2008-09-18	22.3GB / 22.3GB↑	
2008-09-17	22.3GB / 23.3MB↑	
2008-09-16	22.3GB / 19.2MB↑	
2008-09-15	22.3GB / 37MB↑	
2008-09-12	22GB / 230MB↑	

#### Key

Data Backed Up	
Size on Medium↑	

- Other uses
  - ▣ Backing up Hyper-V guests
  - ▣ Backing up VMware guests
  - ▣ Adding media rotation to other types of backups
  - ▣ Overcoming limited backup windows for slow tape drives – D2D2T
  - ▣ General scheduled copying with reporting
  - ▣ Backing up huge data sets quickly
  
- BackupAssist Scenarios White Paper describes these scenarios in more detail

- What are we working next?
  - ▣ Encryption on backup disk
  - ▣ Maintaining a separate copy of NTFS security and alternate data streams, to cater for non-NTFS backup devices like Linux NAS

Archival backup (versioning)  
Backup files & folders

Backup large data sets / limited windows

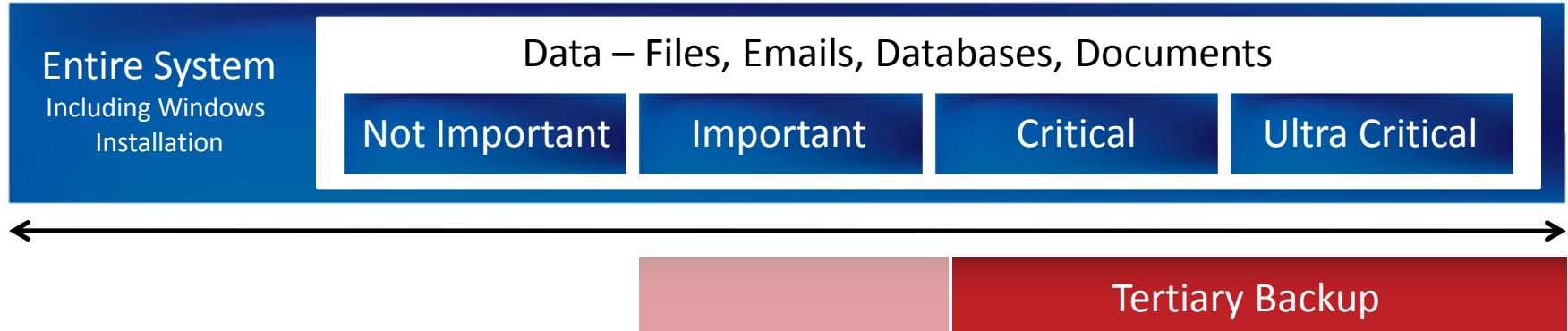
Virtual machine backup

Media rotation for “static” backups

Bare metal system recovery

Internet based backup

Application aware backup



## Tertiary Backup

objective is automated offsite  
backup of critical data

- Let's begin by recapping some of the “challenges” with Internet Backup...

# Challenges with Internet Backup



Yet another piece  
of software

*“More administrative  
overhead and yet  
another vendor.”*



Internet

Slow connection and  
too much data

*“Will my data fit  
through the pipe?”*



Potentially expensive hosting  
fees & vendor lock-in

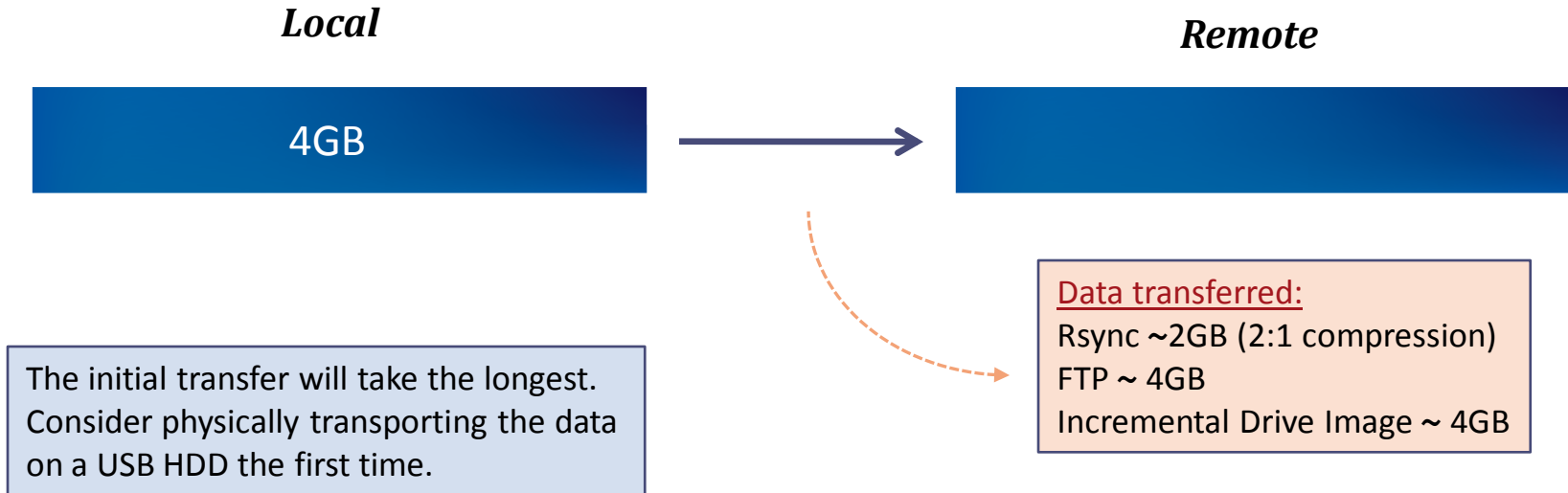
*“I want flexibility  
choosing where to  
host my data.”*

## BackupAssist addresses all of these issues!

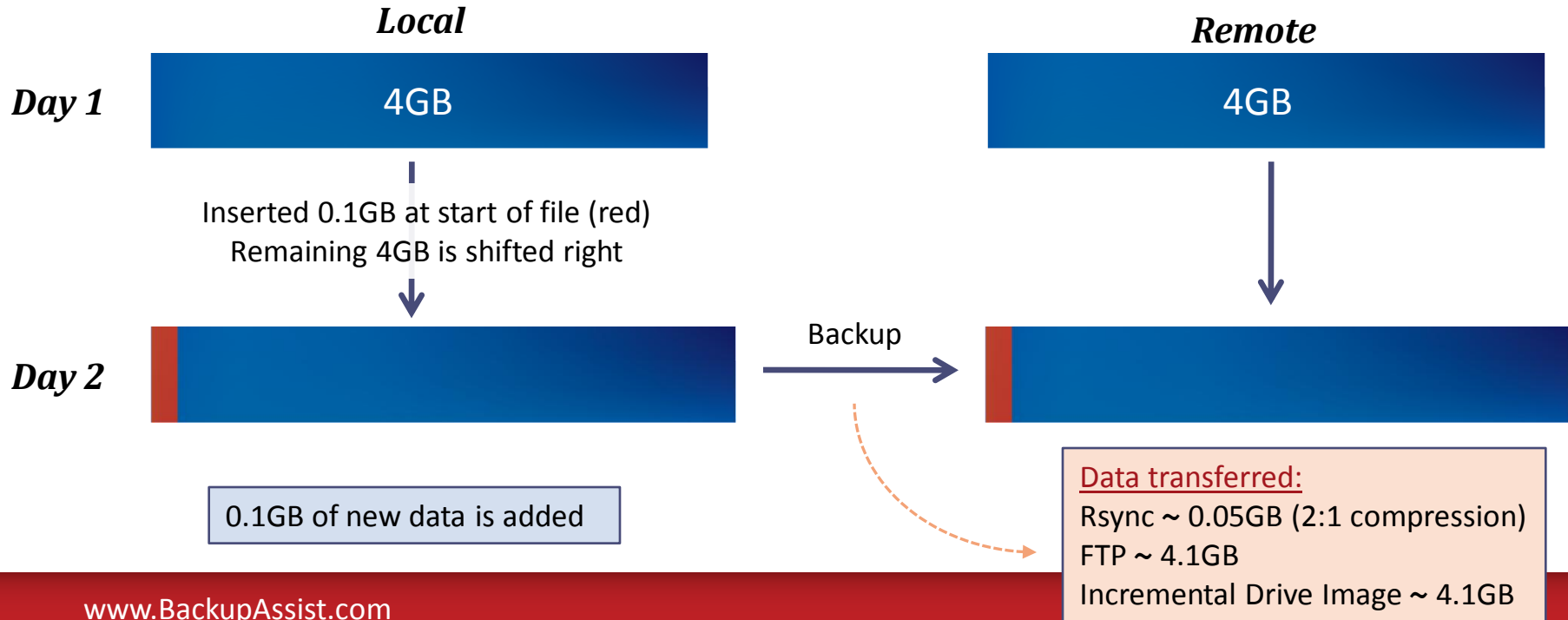
- The limited bandwidth problem is solved by using a bandwidth efficient backup method.
  
- What is bandwidth efficiency?  
It means transferring only the minimum required information to reconstruct the data at the remote site
  
- Let's look at an example: a 4 gig file –
  - We'll compare performance of Rsync vs. FTP vs. Incremental Drive Image.
  - Assume that the data compresses 2:1 using ZIP compression.
  - We'll simulate 3 successive days of backups in the next few slides



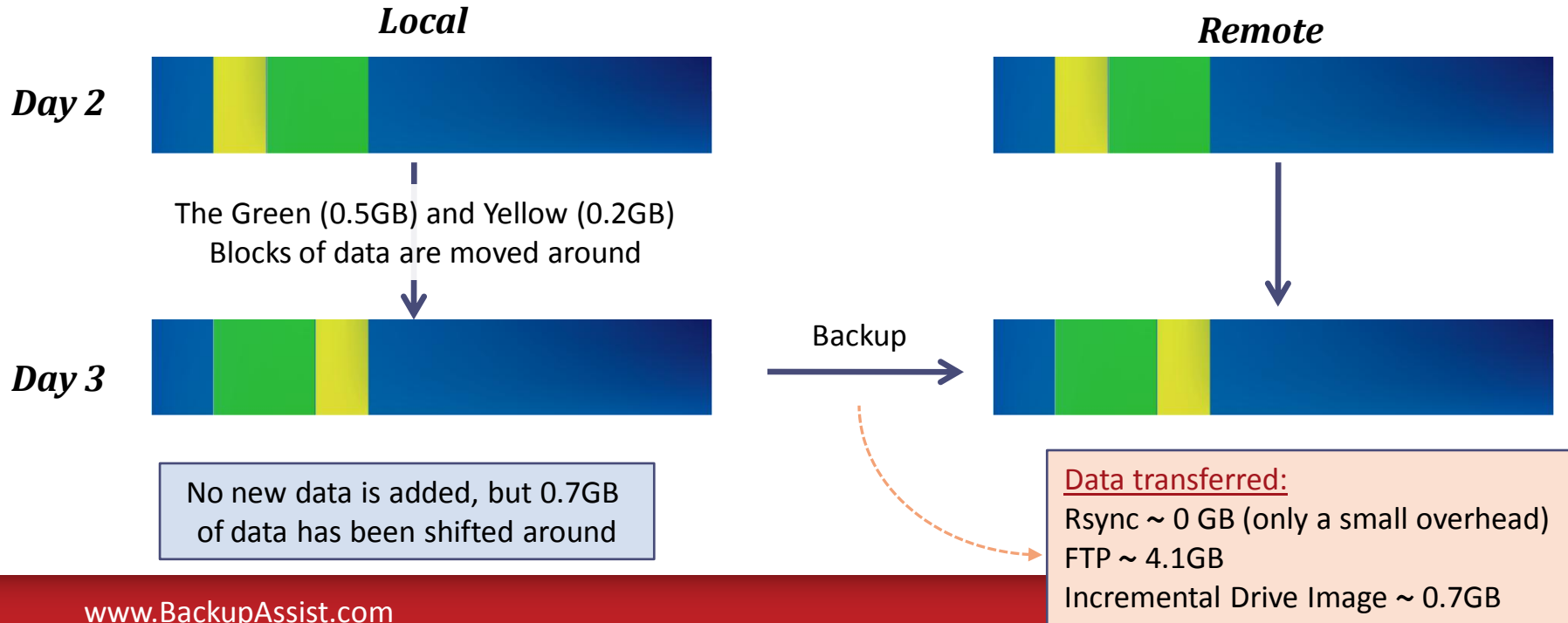
- Day 1 – the first backup. Nothing exists at the remote location, so a complete transfer is required.



- Day 2 – the second backup.  
0.1GB is inserted at the start of the file (in red)



- Day 3 – the third backup.  
The yellow and green blocks are shifted around



- The Rsync algorithm that's used in BackupAssist is bandwidth efficient and caters for all possible cases:
  - ▣ Inserted or added data
  - ▣ Removed data
  - ▣ Shifted data
- More effective than Incremental Drive Imaging, and dramatically more effective than FTP or File Copying
- Limited bandwidth problem solved!  
(Actual real-life scenario performance analysis later in this presentation)

- Next problem: most Internet based backup offerings lock you into a particular data host which may be unappealing because of costs or limitations.
- Example quotation from major American provider:
  - ▣ Backing up 100 GB
  - ▣ US \$714 per month.. on a 36 month contract!

<b>Name:</b>	Linus Chang
<b>Company:</b>	Cortex IT
<b>Title:</b>	Mr
<b>City:</b>	Melbourne
<b>State:</b>	XX
<b>Zip:</b>	3128
<b>Consultant:</b>	No
<b>Email:</b>	[REDACTED]
<b>Phone:</b>	61398994681
<hr/>	
<b>Quote Number:</b>	20080227-9087-2300
<b>Amount of Data:</b>	100 GB
<b>No. of Servers:</b>	2
<b>Remote Locations:</b>	0
<b>How Heard:</b>	Other
<b>Why Visited:</b>	Just doing research on our options
<b>Time Frame:</b>	Within 3 months

**As Low As per Month:**  
\*For Data Volumes Larger than 150GB, See Below. \$714

- Solution: BackupAssist uses the Rsync Protocol – an open standard.

This give you **options** on where you want to host your data and how much it will cost:

- Professional data center in different state / country
- Rsync server behind Amazon S3 ([www.s3rsync.com](http://www.s3rsync.com))
- DIY: remote branch offices, the boss' home – to any Windows or Linux machine, using existing Internet connections

- Revenue opportunity for I.T. Service providers:  
use your existing data center to host your clients'  
data & make recurring revenue:
  - No ongoing service fees to the software vendor
  - No special hardware or software requirements
  
- Or if you don't have your own data center, you  
can resell others' services

- What is Rsync?
  - ▣ The most widely deployed, most widely used and original file-based bandwidth efficient remote synchronization tool
- BackupAssist adds the necessary features to provide a complete SMB backup solution:
  - ▣ VSS support
  - ▣ Backup schemes (for version history)
  - ▣ Scheduling
  - ▣ Reporting & monitoring
  - ▣ Straightforward, easy to use, easy to manage user interface that hides the underlying complexities



- Let's do some performance analysis – typical small business with 12 staff and 22 GB data

Excellent performance.  
Typically 5 – 9 minutes  
at 1Mbit.

Simply multiply the  
numbers by 10 to get  
an indication of how it  
would perform for a  
medium sized business  
with 220 GB of data.

Date	Data protected		Changed files		Data sent over the wire (1 Mbit)	
	Num files	Size (GB)	Num files	Size (MB)	Size (MB)	Total time (mm:ss)
22 Sep 2008	63,752	22.3	55	4.9	5.9	4:44
19 Sep 2008	63,704	22.3	28	4.0	2.5	4:00
18 Sep 2008	63,689	22.3	37	10.3	5.0	5:02
17 Sep 2008	63,663	22.3	16	4.3	2.4	3:53
16 Sep 2008	63,657	22.3	19	3.3	3.0	3:57
15 Sep 2008	63,645	22.3	22	6.0	5.1	5:29
12 Sep 2008	63,640	22.3	90	475.2	284.8	56:00
11 Sep 2008	Problem with Internet connection; backup not run					
10 Sep 2008	63,610	22.0	39	41.7	11.3	5:35
9 Sep 2008	Problem with Internet connection; backup not run					
8 Sep 2008	63,602	22.0	47	40.2	24.8	8:29
4 Sep 2008	63,571	22.0	49	113.3	102.0	22:07
3 Sep 2008	63,542	22.0	46	56.6	19.2	6:57
2 Sep 2008	63,503	21.9	33	16.1	14.0	6:04
1 Sep 2008	63,510	21.9	22	11.2	11.1	5:23

## ■ Performance analysis – SQL database backup 4.2GB

One day of changes:  
Matched 98% of original  
Sent 0.56% of new file  
4 minutes @ 1Mbit

Data Type	Original	New	Bytes sent	Network time @1Mbit
SQL Server Backup (Goldmine)	19/09/2008	22/09/2008	23,920 KB (1/ 180 <sup>th</sup> the original, or	4 mins
	4,290,147 KB	4,296,803 KB	0.56%)  matched: 4,200,754KB (98% of original)	(normally 11 hrs 56 mins)

35 days of changes:  
Matched 88% of original  
Sent 4.4% of new file  
29 minutes @ 1Mbit

Data Type	Original	New	Bytes sent	Network time @1Mbit
SQL Server Backup (Goldmine)	29/07/2008	15/09/2008	175,986 KB (1/ 24 <sup>th</sup> the original, or	29 mins
	3,981,096 KB	4,263,395 KB	4.4%)  matched: 3484642KB (88% of original)	(normally 11 hrs 50 mins)

## ■ Performance analysis: Exchange Information Store Backup (using NTBackup)

One day of changes:  
Matched 94% of original  
Sent 3.0% of new file  
20 minutes @ 1Mbit

Data Type	Original	New	Bytes sent	Network time @1Mbit
NTBackup	23/09/2008	24/09/2008	119,758 KB	20 mins
Exchange Info Store	3,935,349 KB	3,958,901 KB	(1/33 <sup>rd</sup> the original, or 3.0%)  matched: 3,693,432 KB (94% of original)	(normally 11 hrs)

## ■ Performance analysis: NTBackup file (backup of files only)

One day of changes:  
Matched 78% of original  
Sent 11.0% of new file  
2hrs 5mins @ 1Mbit

Data Type	Original	New	Bytes sent	Network time @1Mbit
NTBackup BKF (Files)	19/09/2008	22/09/2008	752,825 KB	2 hrs 5 mins
	6,805,191 KB	6,816,671 KB	(1/9 <sup>th</sup> the original, or 11.0%)  matched: 5,274,713KB (78% of original)	(normally 18 hrs 56 mins)

35 days of changes:  
Matched 76% of original  
Sent 12.8% of new file  
2hrs 21mins @ 1Mbit

Data Type	Original	New	Bytes sent	Network time @1Mbit
NTBackup BKF (Files)	29/07/2008	15/09/2008	850,342 KB	2 hrs 21 mins
	6,629,752 KB	6,783,404 KB	(1/8 <sup>th</sup> the original, or 12.8%)  matched: 5051015 KB (76% of original)	(normally 18 hrs 50 mins)

## ■ Conclusion:

- Files & Folders – superb!
- Can replicate application backups offsite:
  - SQL databases – excellent!
  - Exchange Info Store – very good!
- Replicating an NTBackup backup of files – not so good (expect 10% to be sent on minimal changes). Instead, backup your files and folders directly!

Bandwidth effective Internet  
backup of files & folders

Copying SQL, Exchange backups offsite

Copying NTBackup .bkf files offsite

Archival backup (versioning)

Bare metal system recovery

Internet based backup

Complete system backup

Application aware backup

- Different backup technologies have different sweet spots.
- How can we design a backup system that best utilises the available technologies?

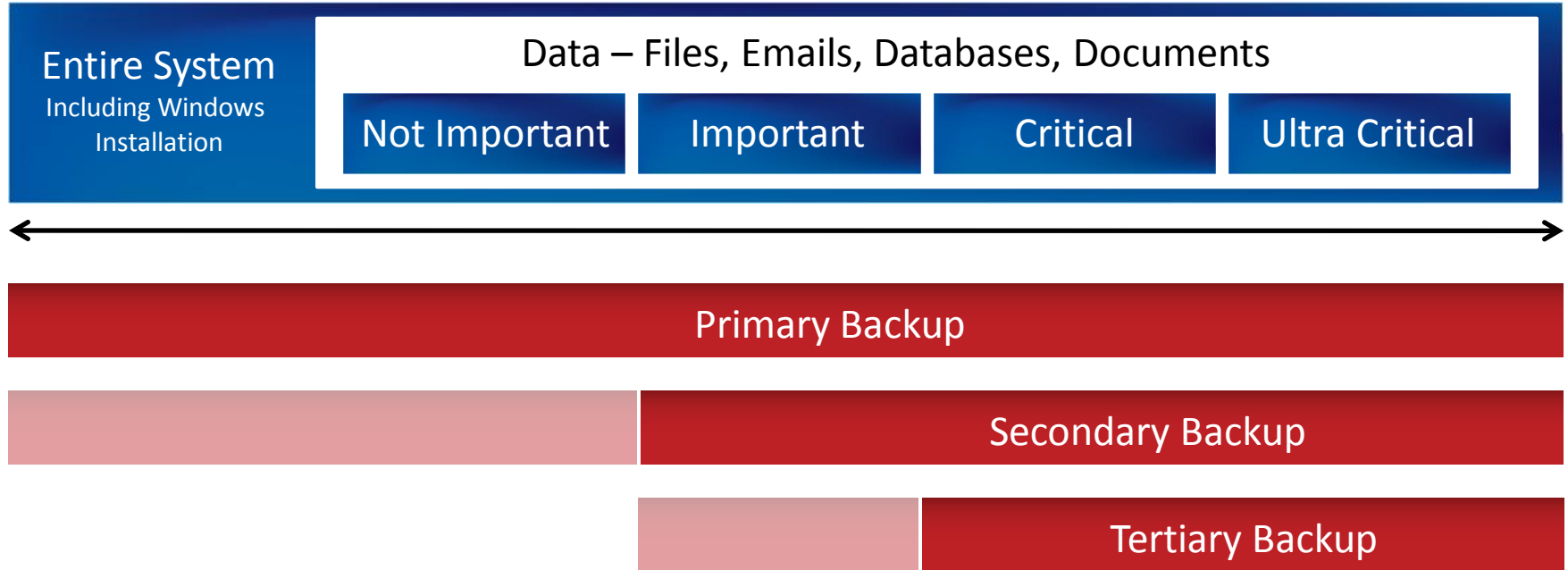
# Types of data



**Step 1:** Look at the data on your server, and decide where each type of data falls into...

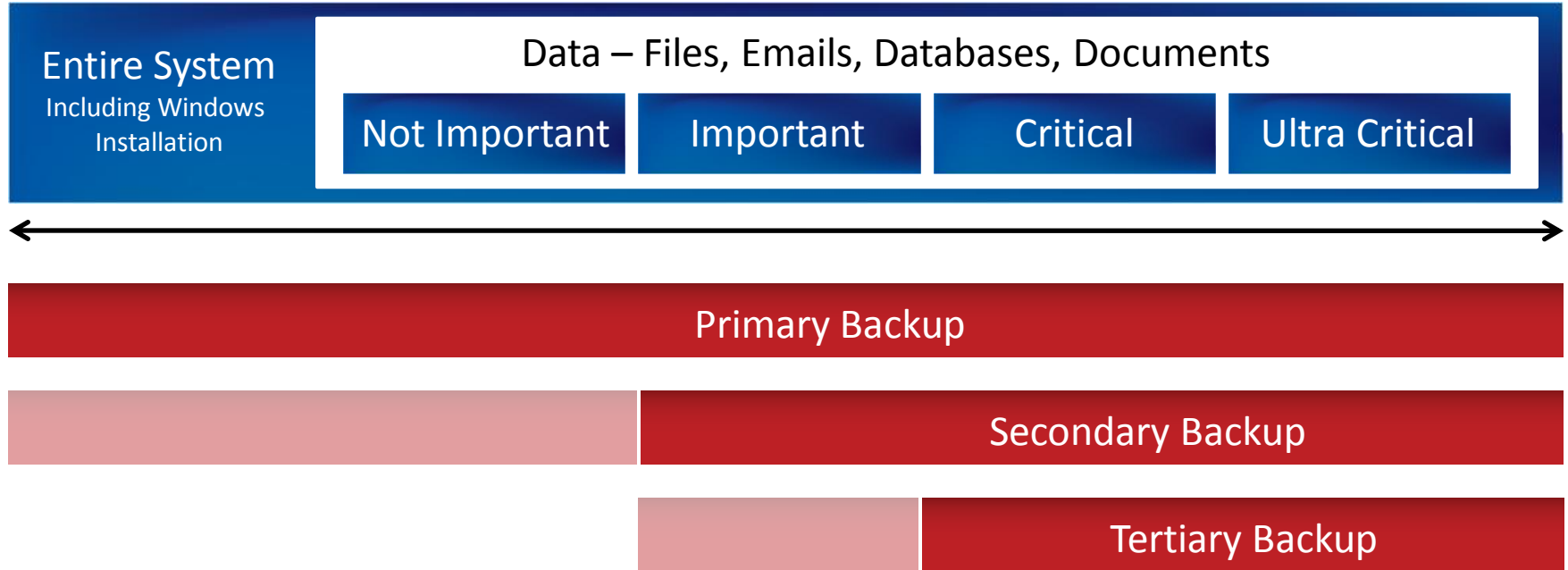


# Multiple layers of protection



**Step 2:** Decide how thoroughly you want to protect your data. The most important types of data should get the most protection. We recommend having up to three types of backups for maximum protection against all causes of data loss. Of course, it's all up to you!

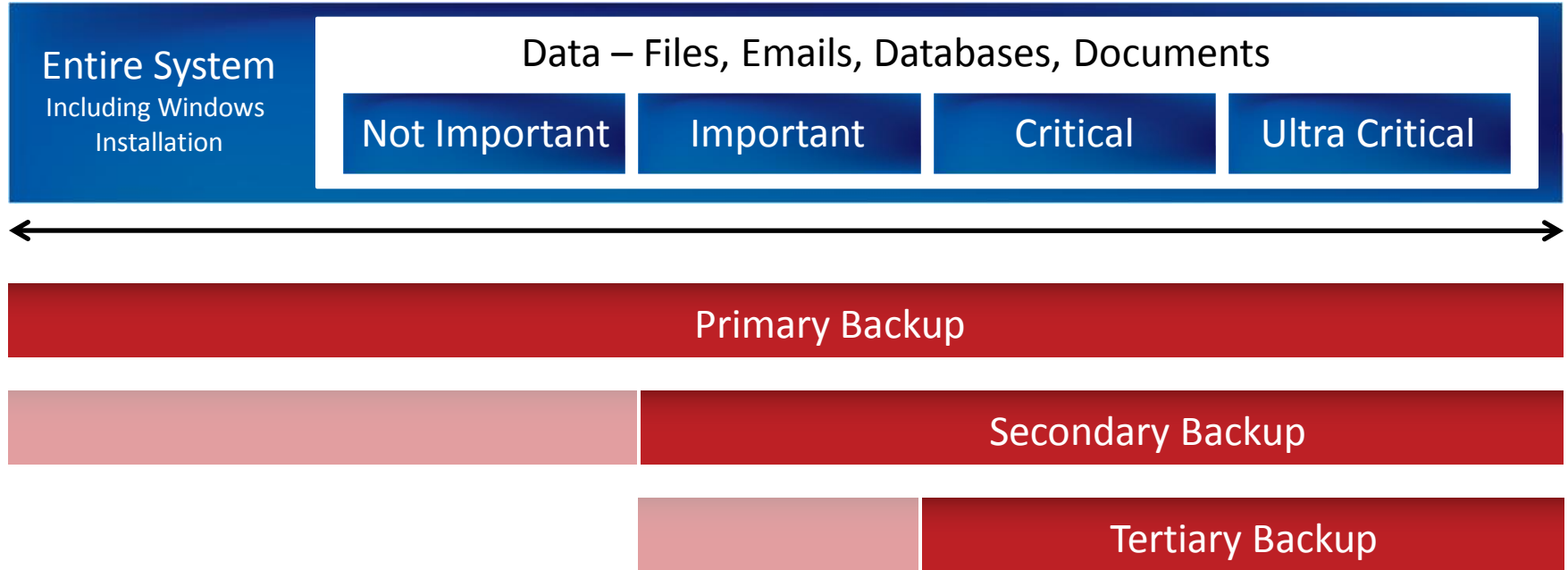
# Multiple layers of protection



## **Advantage #1: Improved reliability.**

If the failure rate of one backup is 5%... The chance that all 3 fail is 0.0125%

# Multiple layers of protection



## Advantage #2: Flexible.

This model can be adapted to many situations.

# Why not do it?



- Reasons not to combine imaging, data archival backup and Internet backup?

# Why not do it?



- Reasons not to combine imaging, data archival backup and Internet backup?
  - ▣ Need 3 different products
  - ▣ Too expensive
  - ▣ Overkill
  - ▣ Hard to monitor
  - ▣ Too complex

# Why not do it?

## ■ Reasons not to combine imaging, data archival backup and Internet backup?

- ~~Need 3 different products~~
- ~~Too expensive~~
- ~~Overkill~~
- ~~Hard to monitor~~
- ~~Too complex~~

**Not anymore!**

# Example #1a – Manual media rotation



- Primary: Daily drive imaging to USB or eSata HDD – complete server backup to 5 rotating HDDs



**Comment:** This is the familiar backup scenario, similar to the users swapping tapes daily.

# Example #1b – Manual media rotation



- Primary: Daily drive imaging to USB HDD – complete server backup to 5 rotating HDDs
- Secondary: Daily fully automated file system & application backup to NAS or USB connected mass storage



**Comment:** Dramatic improvement in file system protection... for just a few hundred dollars!



# Example #1c – Manual media rotation



- Primary: Daily drive imaging to USB HDD – complete server backup to 5 rotating HDDs
- Secondary: Daily fully automated file system & application backup to NAS or USB connected mass storage
- Tertiary: Daily fully automated file system & application backup to remote server



**Comment:** Now protected with automated offsite backups

## Example 2 – No client action required



- But what if your client is “lazy” and prefers not to have to do anything?

# Example #2a – No client action required



- Primary: Manual drive image performed by I.T. Specialist as part of preventative maintenance plan, taken offsite
- Tertiary: Daily fully automated file system & application backup to remote server



**Comment:** Still protected, but not as comprehensively because the secondary backup is missing. Note: The tertiary backup is necessary for up-to-date offsite protection, but restoring all the data from the remote server may be very slow.

# Example #2b – No client action required



- Primary: Manual drive image performed by I.T. Specialist as part of preventative maintenance plan, taken offsite
- Secondary: Daily fully automated file system & application backup to NAS or USB mass storage
- Tertiary: Daily fully automated file system & application backup to remote server



**Comment:** Far superior in terms of backup coverage and restore speed compared to the previous setup, for just a few hundreds of dollars more

# Example #2c – No client action required



- Primary 1: Manual drive image performed by I.T. Specialist and taken offsite
- Primary 2: Daily drive image to NAS / USB mass storage
- Secondary: Daily fully automated file system & application backup to NAS or USB mass storage
- Tertiary: Daily fully automated file system & application backup to remote server



**Comment:** Better again – now performing daily drive images to NAS / USB mass storage for fast local system recovery, at no extra cost.

# Which strategy is right for your client?



- It all depends on:
  - How paranoid is your client?
  - How much are they willing to invest?
  - Your ability to educate your client on the potential dangers.

**Backups are a lot like car safety features...**

**Seat belts** **Disaster recovery protection**  
Recover from a complete server failure due to:

- Hardware failure
- Theft
- Fire

Solution: Complete server backup / image

**Anti-lock brakes** **Data loss & corruption protection**  
Recover data from historical points in time due to:

- Accidental or intentional deletion
- Application corruption
- Malware / virus infections

Solution: Archival data & application backup

**Air bags** **Offsite data protection**  
"Last line of defence" protection for when other backups fail, or when catastrophes that destroy your other backups, hit:

- Earthquake
- Hurricane
- Flood
- Bushfires

Solution: Automated offsite backup

We *hope* that we never need them...  
**BUT AFTER THE EVENT**  
we *wish* we had them all!

**Data loss can happen when you least expect...**

**Architect brings house down** **The Daily Telegraph** 23<sup>rd</sup> January 2008

THEY say revenge is a dish best served cold, and Marie-Louise Cooley must be wishing she had listened.

The Florida architect saw a job advertisement in the local paper for a position she believed was her current job, with her own boss's number attached and, thinking she would be fired, decided to meet out her own punishment.

**The 41-year-old went to her office late on Sunday night and erased seven years worth of drawings and blueprints, estimated to have been worth about \$2.5 million.**

"She decided to mess up everything for everybody," Jacksonville Sheriff's Office spokesman Ken Jefferson told Fox.

"She just sabotaged the entire business, thinking she was going to get ahead."

It didn't take Steven Hutchins, owner of the architectural firm that bears his name, much time to figure out who'd done it — Cooley was the only other person who had full access to the files.

Police arrested Cooley and charged her with causing greater than \$1,000 damage to computer files, a felony.

She was hailed out the following afternoon.

Hutchins told one TV station he'd managed to recover all the files using an expensive data-recovery service.

As for the job, Cooley originally wasn't in danger of losing it. But it now.

The ad was for Hutchins' wife's company:  
<http://www.news.com.au/dailytelegraph/story/0,21045,23107343,5012895,00.html>

**Avoid the risk.  
Use BackupAssist.**

The handouts can help educate your clients!

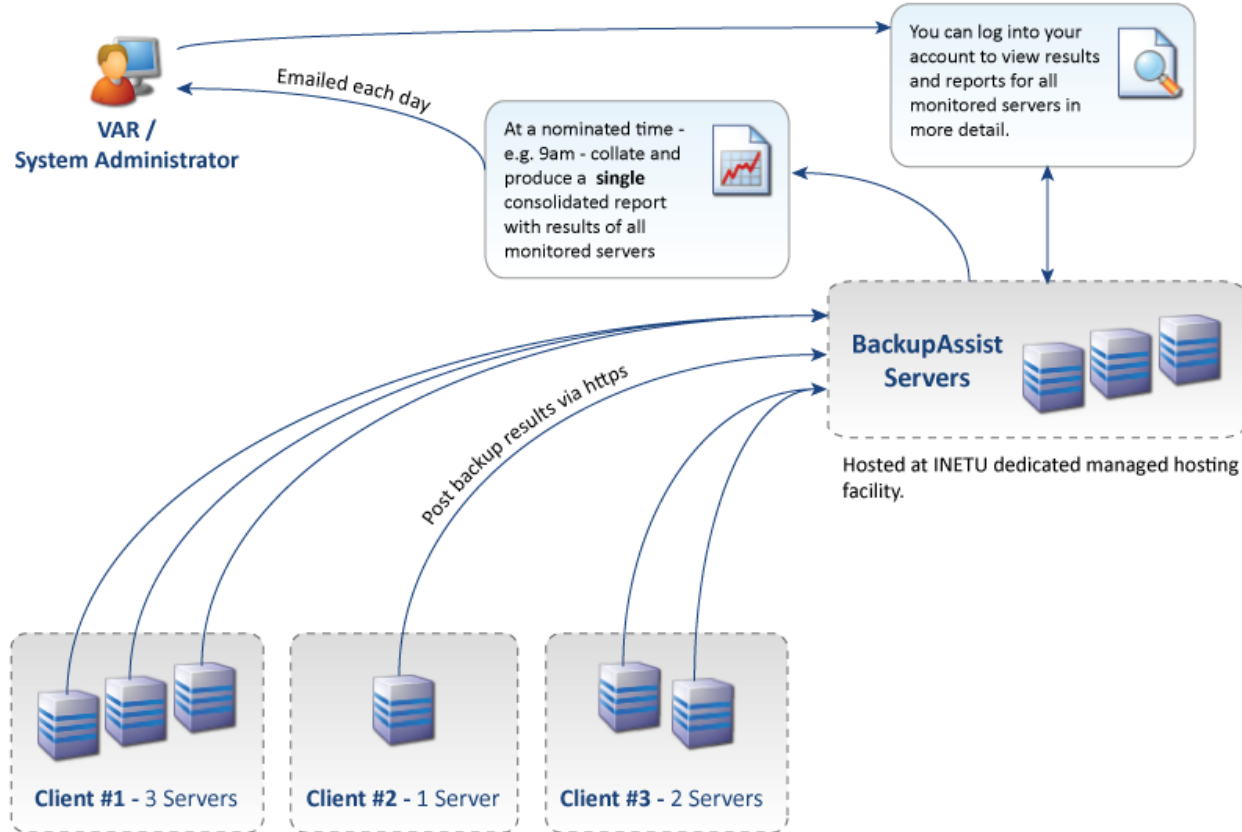
- Initial sale of hardware and software
- Haas – place a NAS device into client’s network; charge monthly fee
- Internet backup – use your own existing data centre, or buy a server & on-sell space to your client [buy in bulk, resell and mark up]
- Full service monitoring

- Making everything completely integrated for the I.T. Specialist...
  
- Centralized Monitoring Console
  - Hosted service, consisting of:
    - Web console – access reports, generate rebrandable PDFs to give to clients
    - Daily email – status of all monitored jobs in last 24 hours



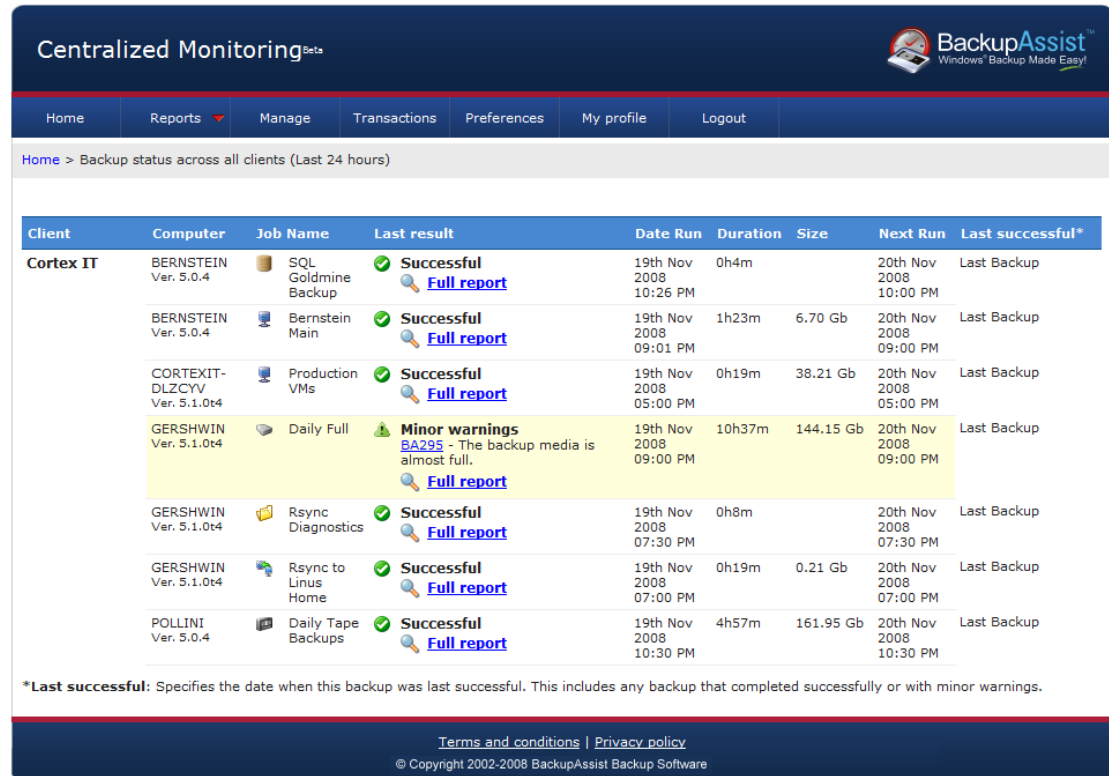
# Centralized Monitoring - How it works

## Centralized Monitoring Overview



## ■ Real life example – our own servers

- Concise summary of all jobs across all clients
- Drill down by clicking the links
- Any problems are placed at the top of the report
- Emailed to you daily, or view in your web browser



Centralized Monitoring<sup>Beta</sup>

Home Reports Manage Transactions Preferences My profile Logout

Home > Backup status across all clients (Last 24 hours)

Client	Computer	Job Name	Last result	Date Run	Duration	Size	Next Run	Last successful*
Cortex IT	BERNSTEIN Ver. 5.0.4	SQL Goldmine Backup	Successful <a href="#">Full report</a>	19th Nov 2008 10:26 PM	0h4m		20th Nov 2008 10:00 PM	Last Backup
	BERNSTEIN Ver. 5.0.4	Bernstein Main	Successful <a href="#">Full report</a>	19th Nov 2008 09:01 PM	1h23m	6.70 Gb	20th Nov 2008 09:00 PM	Last Backup
	CORTEXIT-DLZCYV Ver. 5.1.0t4	Production VMs	Successful <a href="#">Full report</a>	19th Nov 2008 05:00 PM	0h19m	38.21 Gb	20th Nov 2008 05:00 PM	Last Backup
	GERSHWIN Ver. 5.1.0t4	Daily Full	Minor warnings BA295 - The backup media is almost full. <a href="#">Full report</a>	19th Nov 2008 09:00 PM	10h37m	144.15 Gb	20th Nov 2008 09:00 PM	Last Backup
	GERSHWIN Ver. 5.1.0t4	Rsync Diagnostics	Successful <a href="#">Full report</a>	19th Nov 2008 07:30 PM	0h8m		20th Nov 2008 07:30 PM	Last Backup
	GERSHWIN Ver. 5.1.0t4	Rsync to Linus Home	Successful <a href="#">Full report</a>	19th Nov 2008 07:00 PM	0h19m	0.21 Gb	20th Nov 2008 07:00 PM	Last Backup
	POLLINI Ver. 5.0.4	Daily Tape Backups	Successful <a href="#">Full report</a>	19th Nov 2008 10:30 PM	4h57m	161.95 Gb	20th Nov 2008 10:30 PM	Last Backup

\*Last successful: Specifies the date when this backup was last successful. This includes any backup that completed successfully or with minor warnings.

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# Centralized Monitoring - Samples



## ■ This is the emailed version:

BackupAssist daily report for finished monitored jobs - Message (HTML)

Message

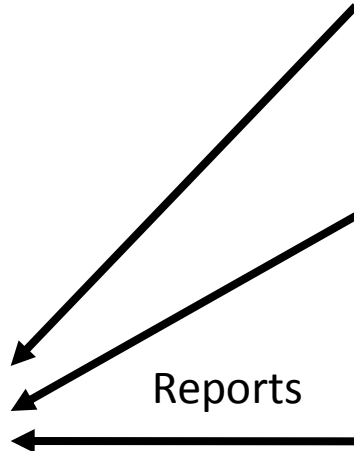
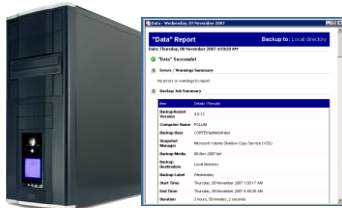
From: BackupAssist Centralized Monitoring [noreply@backupassist.com] Sent: Thu 20/11/2008 11:45 AM  
To: Linus Chang  
Subject: BackupAssist daily report for finished monitored jobs

The following backup jobs ran in the last 24 hours (19th Nov 2008 11:45:00 AM to 20th Nov 2008 11:45:00 AM)

Client	Computer	Job Name	Last result	Date Run	Duration	Size	Next Run	Last successful*
	BERNSTEIN Ver. 5.0.4	SQL Goldmine Backup	Successful <a href="#">Full report</a>	19th Nov 2008 10:26:22 PM	0h4m		20th Nov 2008 10:00:00 PM	Last Backup
	BERNSTEIN Ver. 5.0.4	Bernstein Main	Successful <a href="#">Full report</a>	19th Nov 2008 09:01:49 PM	1h23m	6.70 Gb	20th Nov 2008 09:00:00 PM	Last Backup
	CORTEXIT-DLZCYV Ver. 5.1.014	Production VMs	Successful <a href="#">Full report</a>	19th Nov 2008 05:00:10 PM	0h19m	38.21 Gb	20th Nov 2008 05:00:00 PM	Last Backup
Cortex IT	GERSHWIN Ver. 5.1.014	Daily Full	Minor warnings BA295 - The backup media is almost full. <a href="#">Full report</a>	19th Nov 2008 09:00:20 PM	10h37m	144.15 Gb	20th Nov 2008 09:00:00 PM	Last Backup
	GERSHWIN Ver. 5.1.014	Rsync Diagnostics	Successful <a href="#">Full report</a>	19th Nov 2008 07:30:17 PM	0h8m		20th Nov 2008 07:30:00 PM	Last Backup
	GERSHWIN Ver. 5.1.014	Rsync to Linus Home	Successful <a href="#">Full report</a>	19th Nov 2008 07:00:16 PM	0h19m	0.21 Gb	20th Nov 2008 07:00:00 PM	Last Backup
	POLLINI Ver. 5.0.4	Daily Tape Backups	Successful <a href="#">Full report</a>	19th Nov 2008 10:30:53 PM	4h57m	161.95 Gb	20th Nov 2008 10:30:00 PM	Last Backup

- Centralized Reporting works across all backup types:
  - ▣ NTBackup
  - ▣ Windows Server 2008 Backup
  - ▣ Exchange Mailbox
  - ▣ SQL Server
  - ▣ File Replication
  - ▣ Rsync (Internet based backup)
- You can have different types of backups across different clients, going to different backup devices
- Finally, all these vastly different technologies can be integrated together!

# Centralized Monitoring



One product. One vendor.

One console. One centralized report.

- When will all this be available?
  
- Drive Imaging & File Replication – v5.0
  - ▣ Recently released!
  - ▣ Internet Backup – v5.1, public Beta mid Nov 2008
  - ▣ Full release – later this year

- BackupAssist v5 – AUD\$329
  - NTBackup
  - Drive Imaging
  - File Replication
- Internet backup – add-on around \$149 + GST
- Add-ons also available for Exchange and SQL
- Centralized monitoring – included with BackupCare (\$137.90 per year renewal)

In tonight's presentation we've covered:

- How to combine imaging, file backup and internet backup – BackupAssist is the only solution to provide them all
- Centralized monitoring make the system administrator's lives simpler and save time
- Our pricing model makes it affordable