

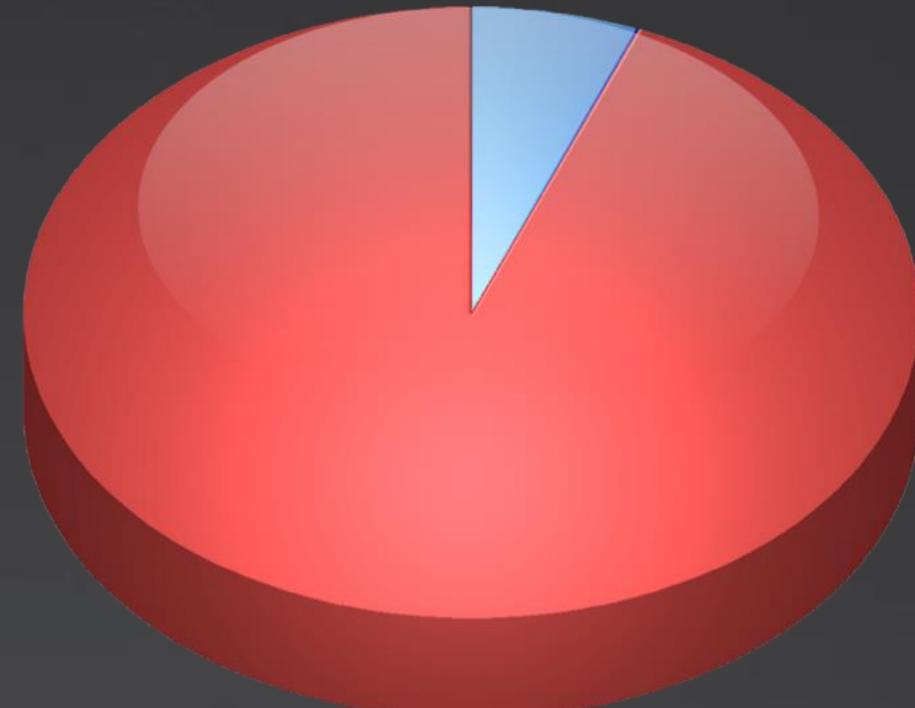


# Storing 100 Petabytes of Cloud Data without Going Broke.

What | MSST Conference  
When | May 2014  
Who | Gleb Budman, CEO

1 of 2 People Lose  
Data Each Year

But, 90% Of People  
Still Do Not Backup



Source: Backblaze research shows 46% of its customers restore data each year.

Harris Interactive Survey conducted June 28 - 30, 2011; Details available at:  
<http://www.backblaze.com/press-June-is-Backup-Awareness-Month-2011.html>



# Backup Online

Backup Online

Restore Easily





# \$5/Month Unlimited



Unlimited Storage

\$5

Just \$5/Month



Amazon S3?



**\$5/Month = 30 GB**



Buy a storage  
system?



Subtotal: \$1,000,000.99

**Checkout**



Build it?

Where to start?





Toss the  
unnecessary

Essential

\$\$



Non-Essential



99.99%  
uptime





Prototype fast –  
plywood works











Use consumer parts –  
stay away from IT tax





# Server Power Supply **VS** Desktop Power Supply





Test, fix, repeat

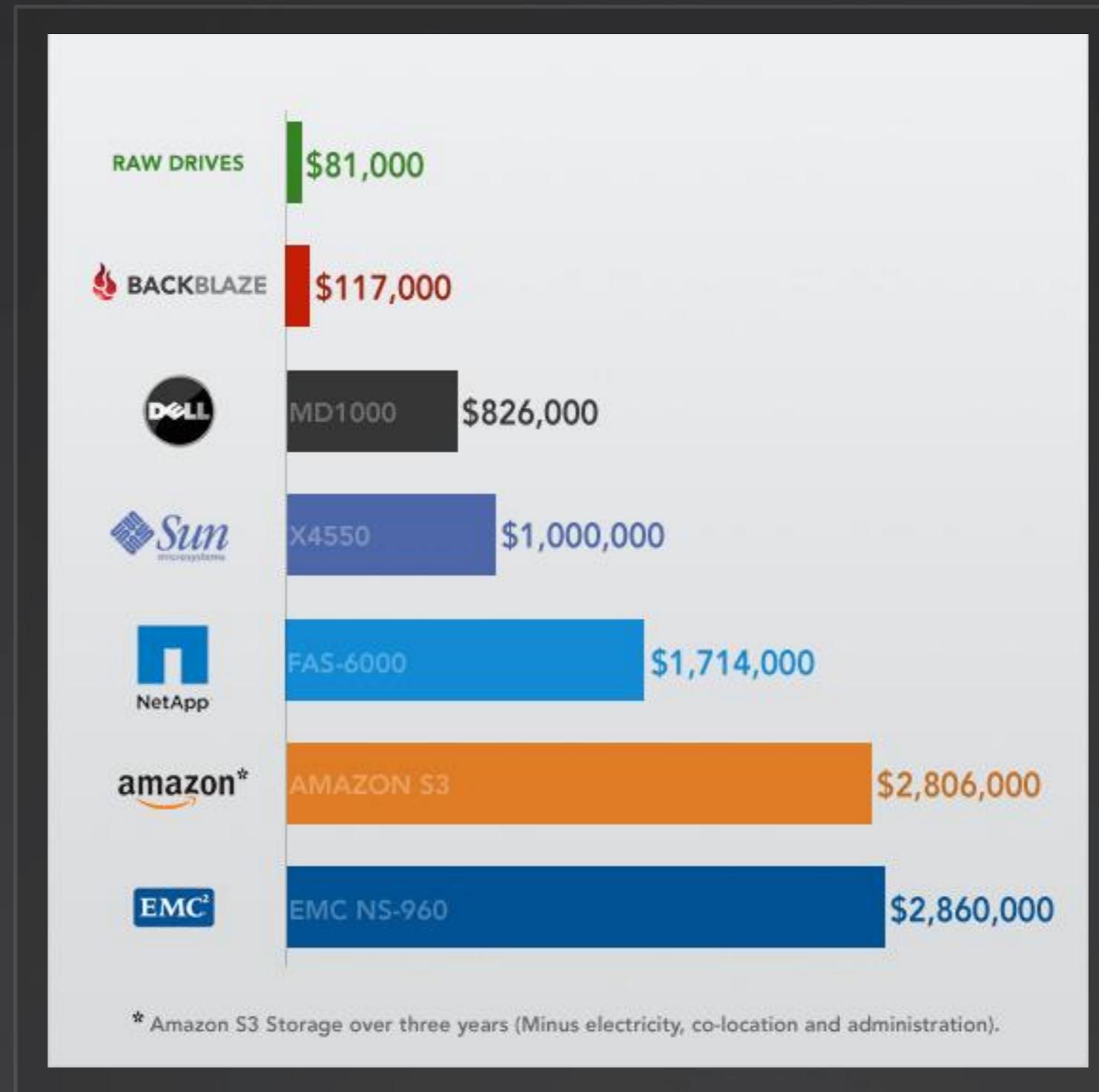




180 Terabytes for \$9,300



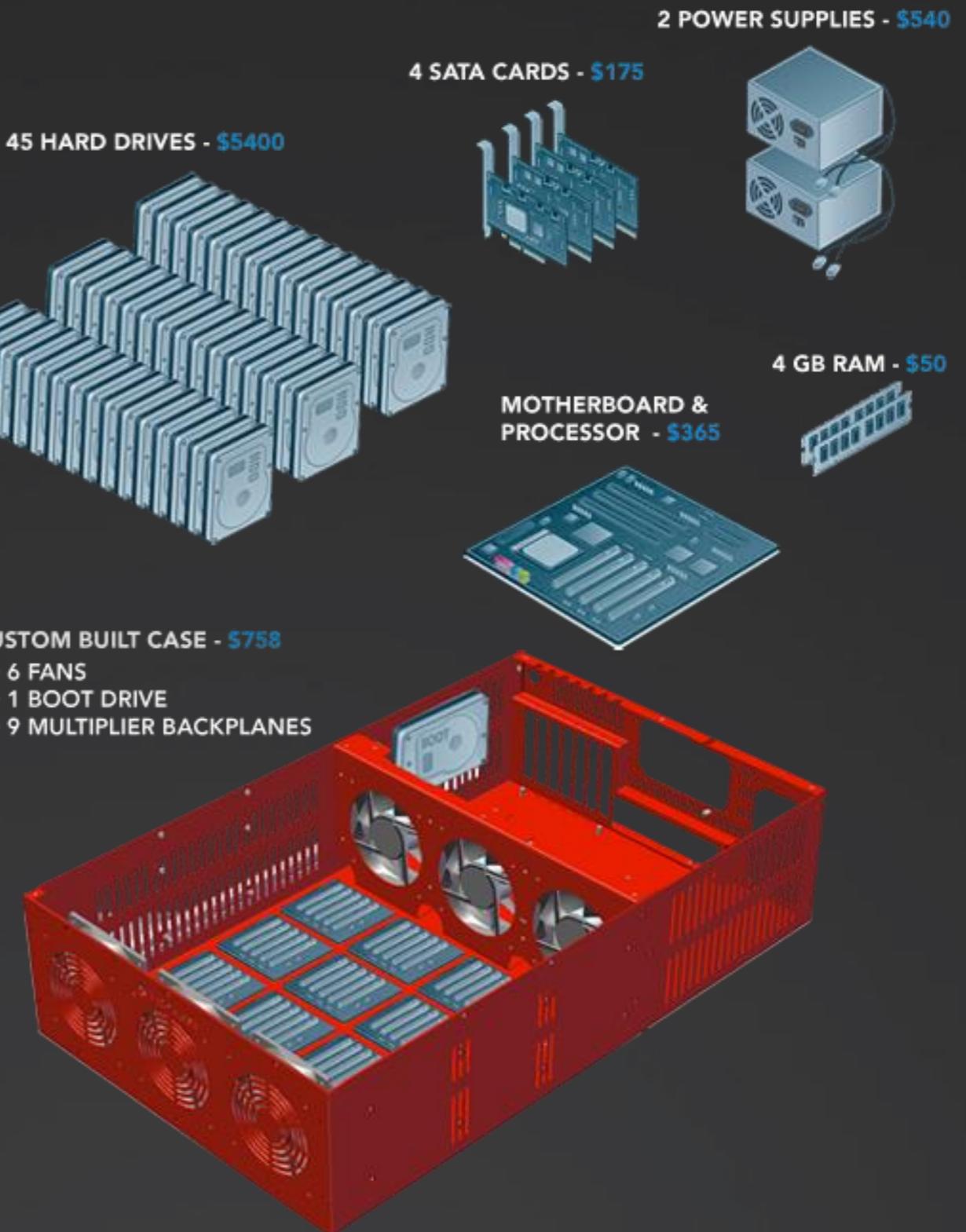
# Cost of a Petabyte (pod v1.0)



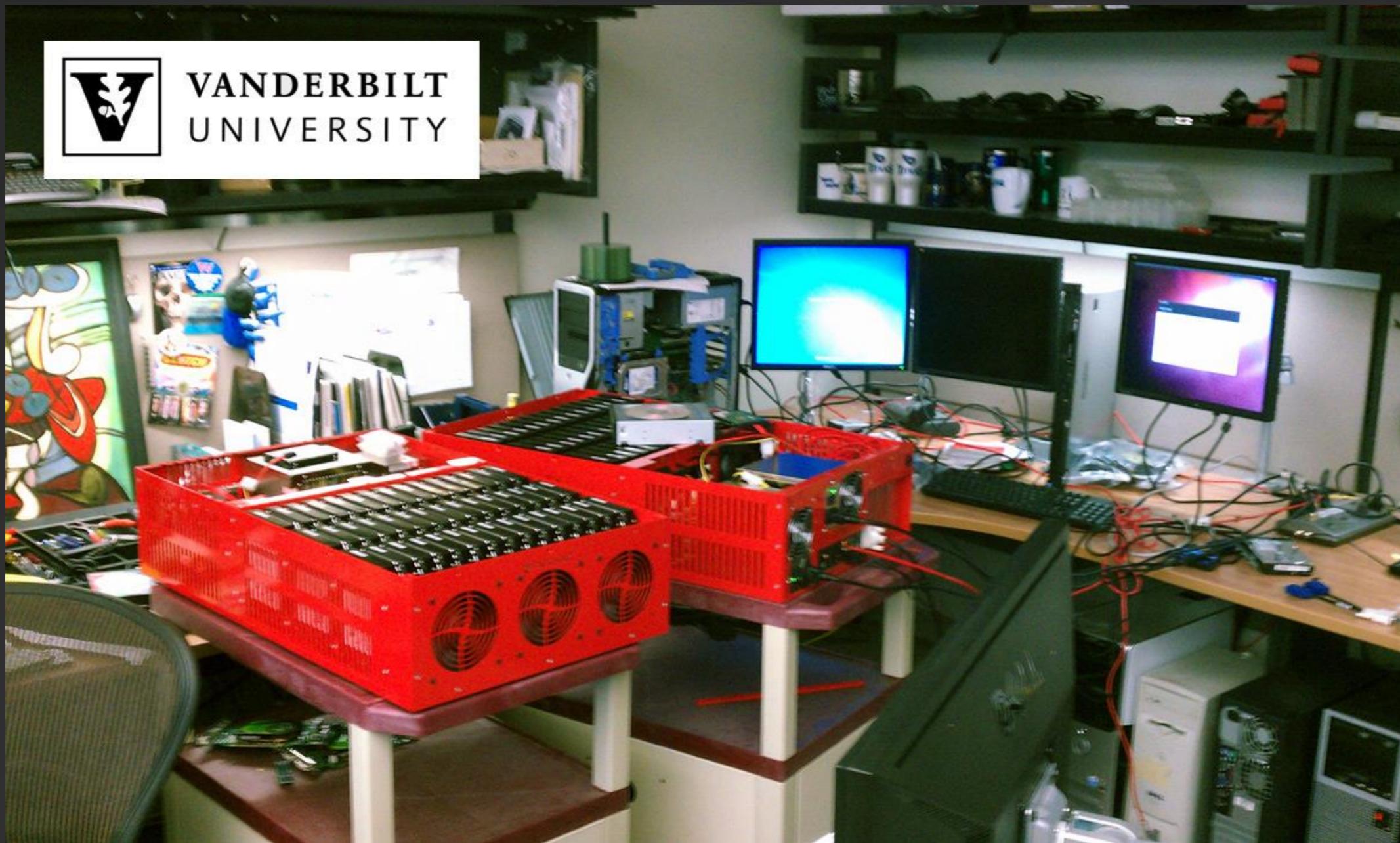


# Open Sourced

Search “petabytes  
on a budget”



# Vanderbilt University





# JPL Nasa





# Crispin Porter + Bogusky





# Red Bull





# Shutterfly





# Netflix Open Connect



# Facebook Open Compute





# Multiple Vendors

The screenshot shows a web browser displaying the Protocase website at [www.protocase.com/products/index.php?e=Backblaze](http://www.protocase.com/products/index.php?e=Backblaze). The page is titled "Protocase: Custom Electronic" and features the Protocase logo and navigation menu. The main content area is titled "Products & Services" and "Electronic Enclosures". A sidebar on the left lists various enclosure types. The main content includes a section for "BackBlaze Storage Pod - Enclosures and Systems" with two options: "Option 1" showing a red Backblaze Storage Pod 2.0 unit with internal components, and "Option 2" showing a red Backblaze Storage Pod 4U Custom Case EMPTY. A blue callout box with the text "Online Backup Made Easy" and "As low as \$3.96/month per computer for unlimited storage" is overlaid on the page, along with a "Click Here to Visit BACKBLAZE" button.



700 Pods / 100 Petabytes





# Backblaze Cloud Storage Software

ca000 – Pods Mgmt

https://ca000.backblaze.com/bzadmin/pods\_mgmt2.htm

Account Lookup Backblaze Forum Local WordPress > Login Apple > Vereor Nos Backblaze Intranet Google ski-epic Pod Ordering SpriteMe

ca000 – Pods Mgmt

BACKBLAZE.

Available Clusters: ca000 ca001

Pods Mgmt Customer Account Mgmt BzAdmin User Mgmt Stats Portal Finance Sign Out

Summary Data

Last Update: 12/18/13 01:49 PM

Free TB: 3774.54

Available TB: 1200.76 (Reserved: 470.0)

Total TB: 53264.05

Current Connections: 8900

Burn Rate / Connections: 38.28 / 7635 (0.0050)

Doomsday Clock: 13.7 - 27.6 days

Full Volumes (< 50 MB)

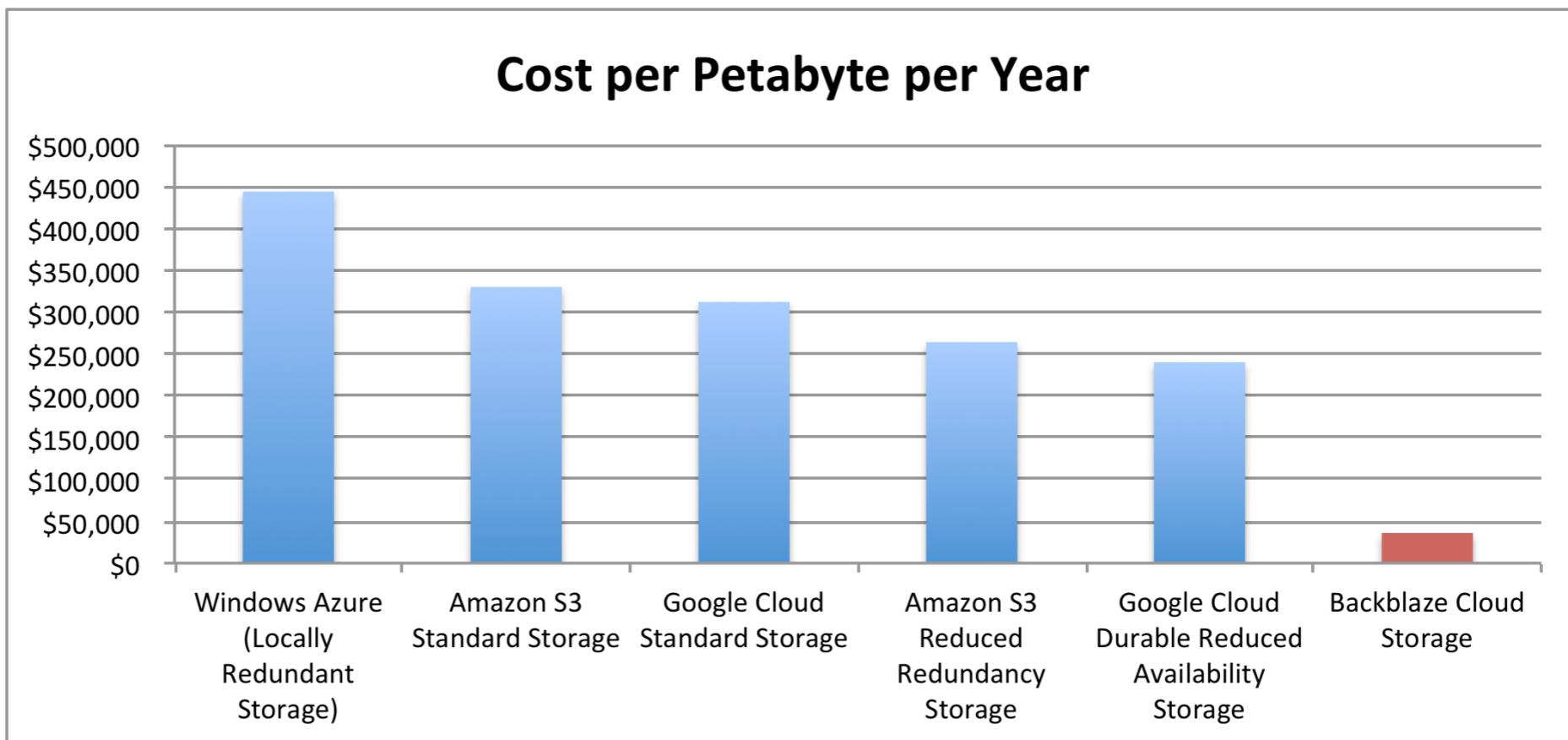
Refresh Page Auto Refresh

Debug | Throttle | Load Balancer | Global Pod Config | Add Pod | Sync Vols

Pod ID	Max Conn	Free TB	Total TB	Cur Conn	Target Conn	State	Maint	Raid Status	Build Date	Notes
566										
ul000 (stats)	450	2.94	104.74	38	36	active	<input type="checkbox"/>		10/01/13	2013.11.15 sata_sil24 freeze – replaced all sata cards; EXT4; 2013.10.15 – random
ul001 (stats)	0	34.2	53.16	0	0	maintenance	<input checked="" type="checkbox"/>		10/01/13	REPLACE sda (missing); BIOS upgraded to 107;
ul002 (stats)	375	1.38	69.77	6	7	active	<input type="checkbox"/>		10/01/13	ext4; MOVED TO SAC; Intel DG43NB BIOS 107; Tomcat reduced to 1G w/ 64k thresh
ul003 (stats)	0	10.67	35.12	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	BIOS updated to 107
ul004 (stats)	0	20.43	31.52	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	BIOS 107;
ul005 (stats)	700	1.45	69.77	9	8	active	<input type="checkbox"/>		10/01/13	(700); MOVED TO SAC; ext4
ul006 (stats)	700	1.59	69.77	10	11	active	<input type="checkbox"/>		10/01/13	(700); MOVED TO SAC; ext4; all sata cards replaced 8-21-2012; system restarted 04
ul007 (stats)	0	15.82	31.52	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	Add Note
ul008 (stats)	0	20.03	31.52	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	Add Note
ul009 (stats)	0	21.81	35.12	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	Intel BIOS 107;
ul010 (stats)	0	15.08	31.52	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	Intel BIOS 107;
ul011 (stats)	0	13.92	31.52	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	Intel DG43NB BIOS 107
ul012 (stats)	375	1.67	69.77	11	13	active	<input type="checkbox"/>		10/01/13	(375); MOVED TO SAC; ext4
ul013 (stats)	0	13.86	31.52	1	0	cleanup_only	<input type="checkbox"/>		10/01/13	BIOS 107
ul014 (stats)	0	14.4	31.52	1	0	cleanup_only	<input type="checkbox"/>		10/01/13	BIOS 107; rfans/r;
ul015 (stats)	0	18.16	35.12	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	JFS Repairs on11-1-2012; Intel DG43NB; BIOS 107
ul016 (stats)	0	15.53	35.12	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	BIOS 107
ul017 (stats)	0	14.35	35.12	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	Intel DG43NB BIOS 107
ul018 (stats)	700	1.4	69.77	11	8	active	<input type="checkbox"/>		10/01/13	(700); MOVED TO SAC; ext4
ul019 (stats)	0	24.9	41.35	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	BIOS 107; 3 new SATA cards 10-8-13; Cocktail Pod
ul020 (stats)	0	34.39	53.16	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	Intel DG43NB BIOS 107;
ul021 (stats)	0	33.79	53.16	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	Intel BIOS 107;
ul022 (stats)	0	33.74	53.16	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	BIOS 107
ul023 (stats)	0	121.36	139.65	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	Accelerated Healing started 2013.11.19 –Ric; MIGRATION complete to ul980; NEW ?
ul024 (stats)	0	34.13	53.16	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	BIOS updated to 107
ul025 (stats)	300	81.01	139.65	0	0	maintenance	<input checked="" type="checkbox"/>		10/01/13	TODO Motherboard and Power Supplies referb; unreachable 12-6-2013 – most likely
ul026 (stats)	0	32.16	53.16	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	BIOS updated to 107
ul027 (stats)	0	33.43	53.16	0	0	maintenance	<input checked="" type="checkbox"/>		10/01/13	REPLACE sdp (media errors); BIOS updated to 107
ul028 (stats)	700	1.58	69.77	12	11	active	<input type="checkbox"/>		10/01/13	(700); MOVED TO SAC; New SuperMicro; ext4
ul029 (stats)	450	2.47	139.65	27	27	active	<input type="checkbox"/>		10/01/13	#believed healthy chassis# Boot drive replaced and reimaged; s/n 054189-003; RMA
ul030 (stats)	0	33.38	53.16	0	0	cleanup_only	<input type="checkbox"/>		10/01/13	Intel BIOS 107

# Cloud Storage Cost Comparison

\$/GB/mo	\$/GB/yr	\$/Petabyte/yr	Cloud Storage Service	Times x Backblaze
\$0.037	\$0.44	\$444,000	Windows Azure (Locally Redundant Storage)	12
\$0.028	\$0.33	\$330,000	Amazon S3 Standard Storage	9
\$0.026	\$0.31	\$312,000	Google Cloud Standard Storage	9
\$0.022	\$0.26	\$264,000	Amazon S3 Reduced Redundancy Storage	7
\$0.020	\$0.24	\$240,000	Google Cloud Durable Reduced Availability Storage	7
\$0.003	\$0.04	\$36,000	Backblaze Cloud Storage	1



Note: updated on April 13, 2014 with all reduced prices announced.



# Do-it-Yourself?

PROS

Control

Optimization

Cost

CONS

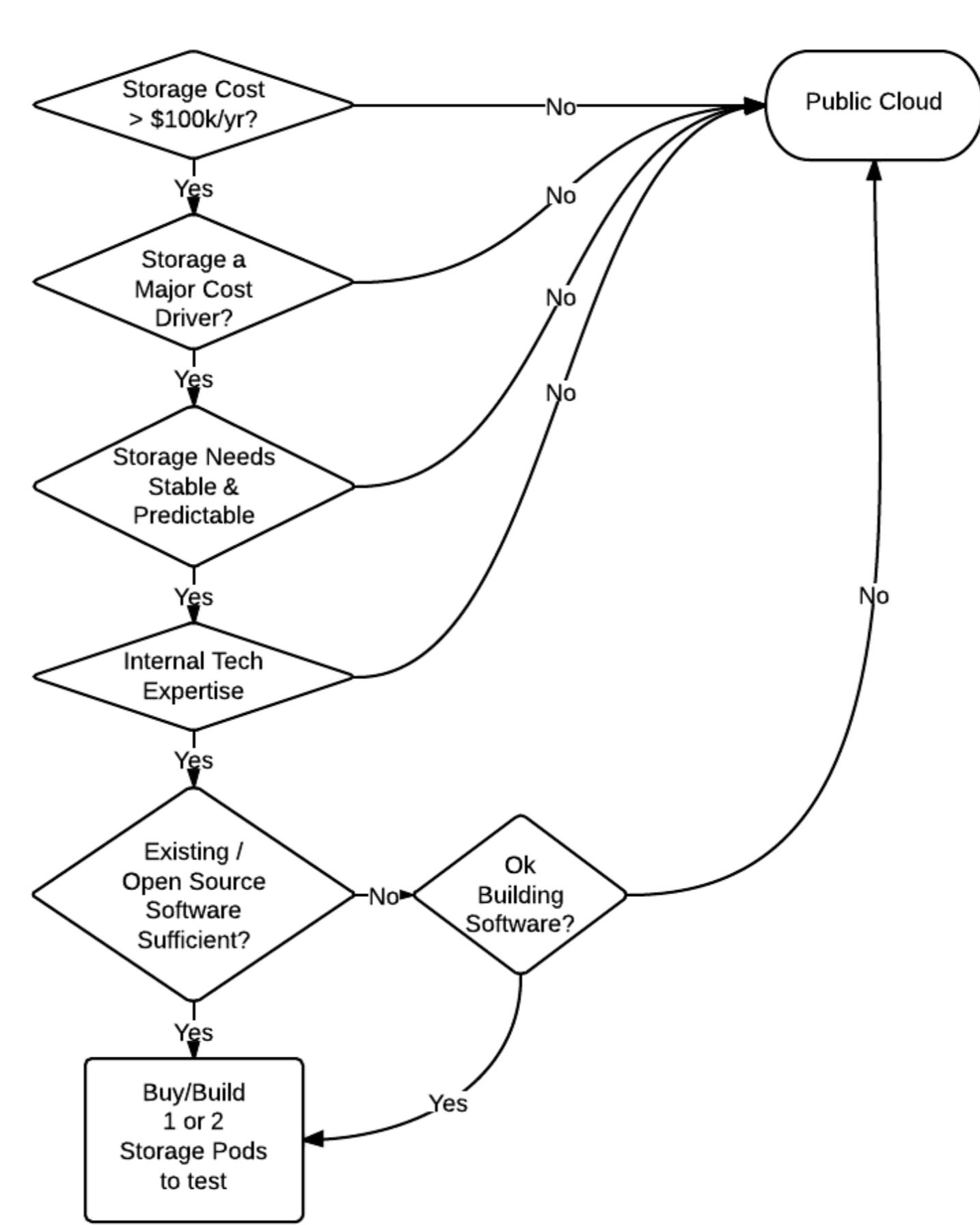
Distraction

Risk

Cost?

# Do-it-Yourself Considerations

- Staffing
- Inventory
- Management
- Purchasing
- Assembly
- Operating
- Upgrading
- Scalability





# Resources

## Hard Drives

[Testing a Backblaze Hard Drive](#)

[How Long Do Disk Drives Last?](#)

[Enterprise Drives: Fact or Fiction?](#)

[What Hard Drive Should I Buy?](#)

[Hard Drive Temperature – Does It Matter?](#)

## Storage Pod

[v1.0: Petabytes on a Budget: How To Build Cheap Cloud Storage](#)

[v2.0: Revealing More Secrets](#)

[v3.0: 180TB of Good Vibrations](#)

[v4.0: Direct Wire Drives – Faster, Simpler and Less Expensive](#)

Additional Resources At: [blog.backblaze.com](http://blog.backblaze.com)



# Storing 100 Petabytes of Cloud Data without Going Broke.

What	MSST Conference
When	May 2014
Who	Gleb Budman, CEO