



Who is Riverbed?

- The IT infrastructure performance company
- A profitable public company (RVBD)
 - \$552 million in revenue (Fiscal 2010)
 - Global sales and support operations
- A trusted IT supplier to 9,300 customers
 - Tens of thousands of appliances installed and operating around the world
- The corporate sponsor of Wireshark®
 - World's leading network analyzer is downloaded nearly 500,000 times a month
 - Riverbed products combine with Wireshark to provide a complete performance management solution







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Award-winning Products for Key Performance Problems

Cascade – Enterprise-wide performance monitoring

- Solve performance problems up to 83% faster
- Executive dashboards that link with detailed analysis
- Perfect for operations, consolidation projects

Steelhead – WAN optimization

- Accelerate applications by up to 100x
- Cut bandwidth utilization by 65-95%
- Enable consolidation, cloud, and more effective DR
- Also impacts virtualization, application rollouts, and mobility

Whitewater – Cloud Storage Accelerator

- Accelerate backup and recovery from public cloud storage
- Cut backup costs by 50% or more
- Solution for storage architects and data protection managers



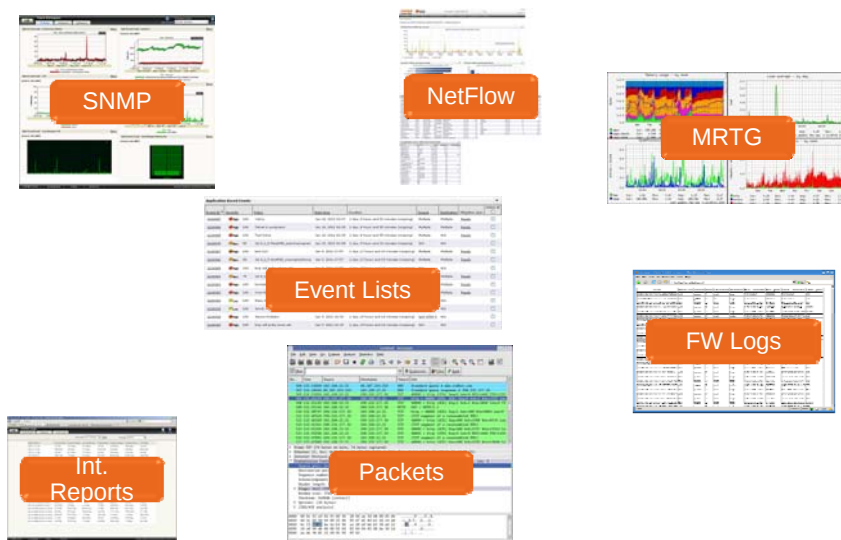


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Cascade

The Problem - Network Data Overload



SNMP

NetFlow

MRTG

Event Lists

FW Logs

Int. Reports

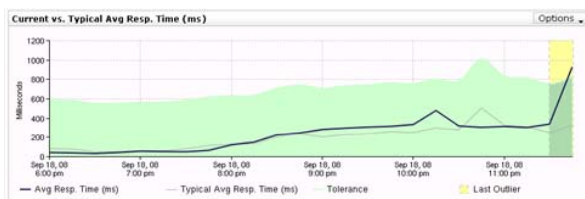
Packets

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Cascade - Use Case

Cascade analytics – How do we do it?



Behavioral analytics

- Learns typical behavior patterns of users, applications and systems across the infrastructure
- Alerts to meaningful changes that signal performance issues
- Allows maximum performance monitoring with minimum time investment by expert personnel

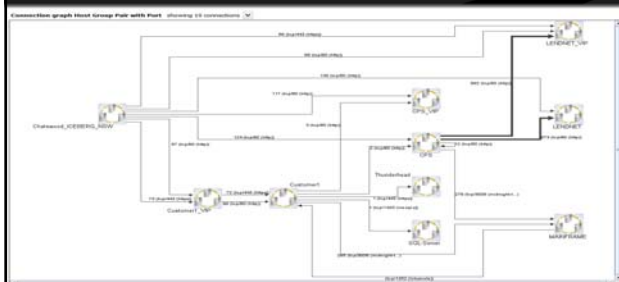
Application analytics - response time, # of connections, bandwidth, retransmissions, and TCP health metrics

Interface analytics - total bandwidth, bandwidth by application, server, users or QoS

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Dependency Mapping, Inventory and Server Consolidation



Dependency data identifies root causes that other systems wouldn't see & visualise what components deliver the application

Identify under utilised servers as candidates for consolidation, virtualization or retirement

Asset Inventory	Host IP	MAC	Location	Host	Scope	Avg H/W	Total H/W	Avg Packet/s	Avg Conn/s
Sun-server-2	172.31.0.14	00:30:48:32:73:03	rack32:05-FastEthernet0/48	10.3.6.58	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
Win-Exchange	172.31.0.91	00:30:48:32:80:07	rack32:05-FastEthernet0/16	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
FTP-server-1	172.31.0.12	00:30:48:32:70:07	rack32:05-FastEthernet0/26	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
FTP-server-1	172.31.1.191	00:30:48:32:87:05	rack32:05-FastEthernet0/49	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
HSC-7	10.1.0.68	00:30:48:32:12:07	rack32:05-FastEthernet0/16	10.3.7.52	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
Unix-cluster-2	172.31.1.179	00:30:48:32:87:02	rack32:05-FastEthernet0/46	10.3.6.162	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
Cell-server-5	10.7.0.46	00:30:48:32:57:06	rack32:05-FastEthernet0/36	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
Hgt-wkst	10.9.0.1	00:30:48:32:61:05	rack32:10-FastEthernet0/12	10.3.6.168	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
IBM-cluster-3	10.12.12.103	00:30:48:32:43:03	rack32:10-FastEthernet0/35	10.3.7.28	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
appsv-025	10.8.0.10	00:30:48:32:60:08	rack32:10-FastEthernet0/25	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
LabWS-rem-4	172.31.0.39	00:30:48:32:78:04	rack32:10-FastEthernet0/16	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
Cell-server-9	10.12.14.100	00:30:48:32:43:06	rack32:10-FastEthernet0/38	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
PC-3	10.7.0.42	00:30:48:32:57:03	rack32:10-FastEthernet0/33	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
mail-server-1	10.7.0.13	00:30:48:32:50:06	rack32:10-FastEthernet0/2	10.3.6.162	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
jmail-002	10.100.0.2	00:30:48:32:42:04	rack35:03-FastEthernet0/17	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
crm-101	10.9.0.5	00:30:48:32:61:08	rack35:03-FastEthernet0/14	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
crm-099	10.0.0.18	00:30:48:32:11:03	rack35:03-FastEthernet0/04	10.3.7.228	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
mpserv-01	172.31.0.11	00:30:48:32:70:06	rack36:03-FastEthernet0/3	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
irc-3400-01	10.1.0.1	00:30:48:32:70:06	rack36:03-FastEthernet0/2	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%
			rack36:03-FastEthernet0/15	10.3.6.172	NA-PachinaeAfrica	< 0.01	< 0.01%	< 0.01	< 0.01%

Resolve problems faster with access to switch port data

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Cascade to drill down & discover problem sources

WAN Nodes - Boston & NY INBOUND Interfaces

Interface Info Report
Traffic for this Network Interface
Traffic for this Network Interface in Context
Interface Optimization Report

By Apps
By Apps with Ports
By Ports
By Port Groups

Example: problem related to high WAN utilization

Let's find the application

Let's find the server

Which user is responsible?

We found it's John Smith

Inbound Traffic by Application 1 - 13 of 13

Application	Avg Kb/s	Avg Packets/s	Total Kb	Total Packets
CIFS	20,052 (92%)	2,508 (73%)	1,203,109 (92%)	150,460 (73%)
SMB			60,044 (5%)	28,379 (14%)
SMB-KER				02 (4%)
unknown				00 (7%)

Host Pair 1 - 4 of 4

Server	Server Group	Client	Client Group	Avg Bits/s
10.65.3.83	Cambridge	10.192.30.127	Cambridge	20,395,288 (99%)
10.65.3.83	Cambridge	10.192.30.130	Cambridge	93,129 (< 1%)
10.65.3.83	Ca			42,137 (< 1%)
10.65.3.83	Ca			2,502 (< 1%)
10.65.3.83	Ca			1,532,054 (100%)
Total				

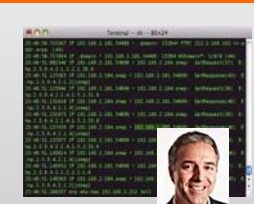
User Report

Host	Time	User	Name	Domain	AD Source	Logged In
Workstation-7	Dec 16, 2009 12:30 PM	john-smith		riverbed.com	172.31.0.39	Yes

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Riverbed Knows Packet Capture and Analysis

TCPDUMP	Wireshark	WinPcap
 - Co-founder Dr. Steve McCanne - Creator of TCPDUMP	 - Dir. of Open Source Projects Gerald Combs - Creator of Wireshark	 - CACE Co-founder Loris Degioanni - Creator of WinPCap

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Profiler → Shark: Seamless Drill-Down

The screenshot displays the Riverbed Profiler interface, which is integrated with Wireshark (Shark). The Profiler window shows a list of applications on the left, including CIFS, SMB, SMB-KER, unknown, WEB, RDP, NETBIOS, SNMP, SSH, H223, unclassified, MSSQL-S, and MSSQL-S. The main window shows a traffic capture for the network interface 192.168.1.10. A packet is selected, and the details pane shows the packet structure, including Ethernet II, Internet Protocol, and Transmission Control Protocol. The packet is being sent to Wireshark for further analysis.

Interface Info Report
Traffic for this Network Interface

Inbound Applications

Application	Avg Packets/s	Percentage
CIFS	470	(99%)
SMB	23	(< 1%)
SMB-KER	11	(< 1%)
unknown	3	(< 1%)
WEB	508	(100%)
RDP		
NETBIOS		
SNMP		
SSH		
H223		
unclassified		
MSSQL-S		
MSSQL-S		
Total		

Send to Wireshark

Packet Details

- Ethernet II, Src: 192.168.0.2 (00:0c:29:14:2d:cd:02), Dst: Netgear-3d17:18a (00:09:1b:2d:17:18a)
- Internet Protocol, Src: 192.168.0.2 (192.168.0.2), Dst: 192.168.0.1 (192.168.0.1)
- Transmission Control Protocol, Src Port: 3196 (3196), Dst Port: HTTP (80), Seq: 0, Len: 0
- Source port: 3196 (3196)
- Destination port: http (80)
- Sequence number: 0 (relative sequence number)
- Header length: 28 bytes
- Window size: 64340

Packet Data

```

0000  00 00 15 32 74 00 15 14 20 c8 02 00 00 41 00  ..[.....]....
0010  00 30 34 40 40 00 80 06 83 2c c0 a0 00 03 00 a0  ..[.....]....
0020  00 03 50 74 00 10 14 40 18 00 00 00 00 70 00 00  ..[.....]....
0030  f8 f0 27 e0 00 00 02 04 e5 54 01 01 04 02  ..[.....]....
  
```

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Steelhead

13

Cloud Steelhead Uniqueness

- Simple portal-based management
- Seamless cloud integration
- Subscription pricing model
- Instant deployment
- Easy cloning
- Multi-Cloud Support (Amazon and ESX based providers)

Cloud Steelhead



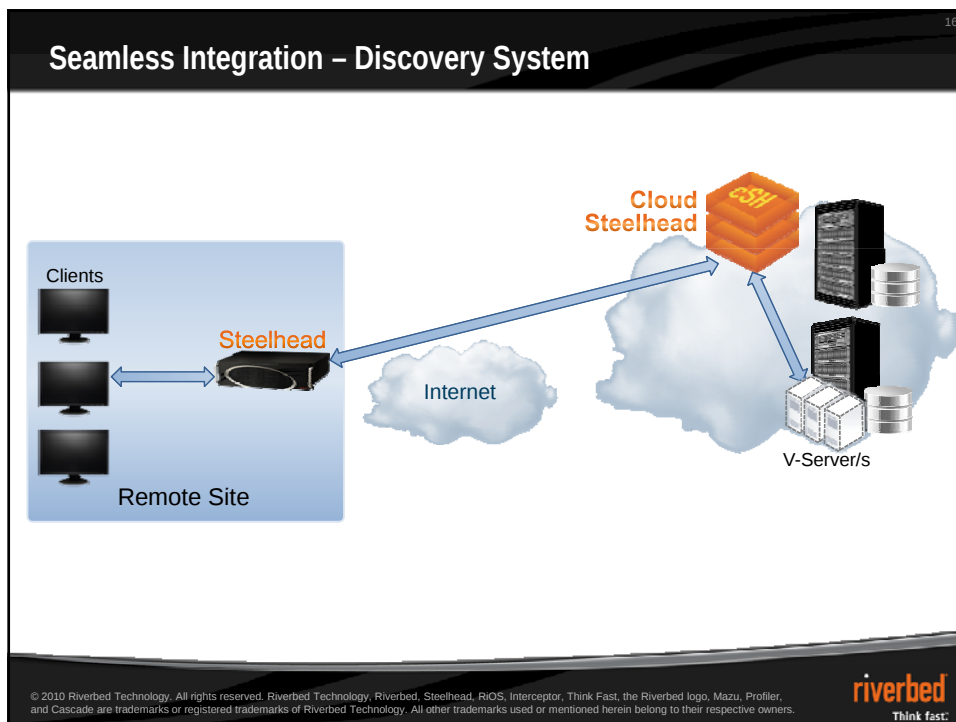
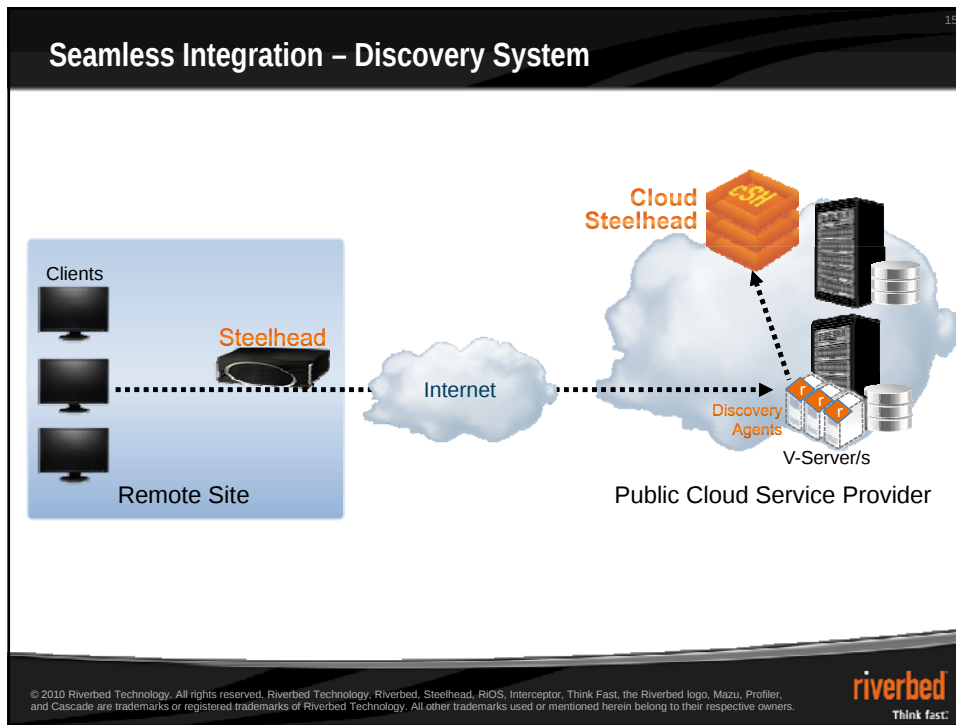
Steelhead Acceleration

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14

Cloud Steelhead Use Case

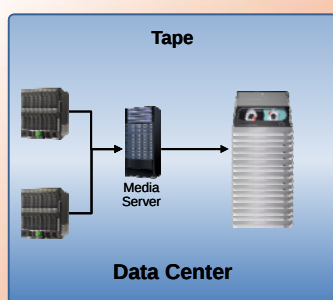


17

Whitewater

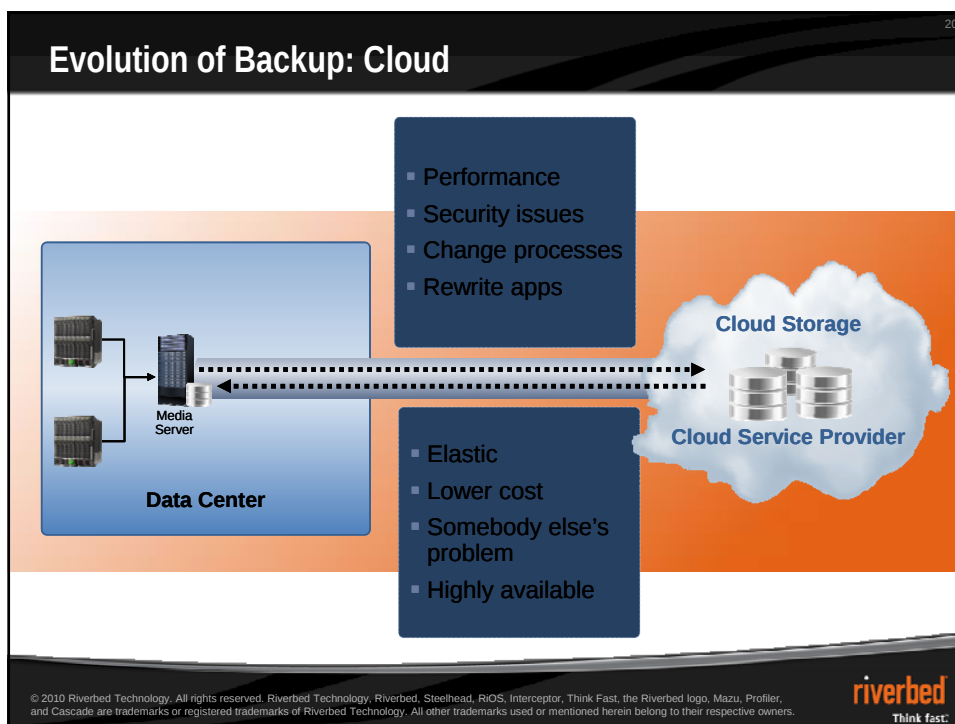
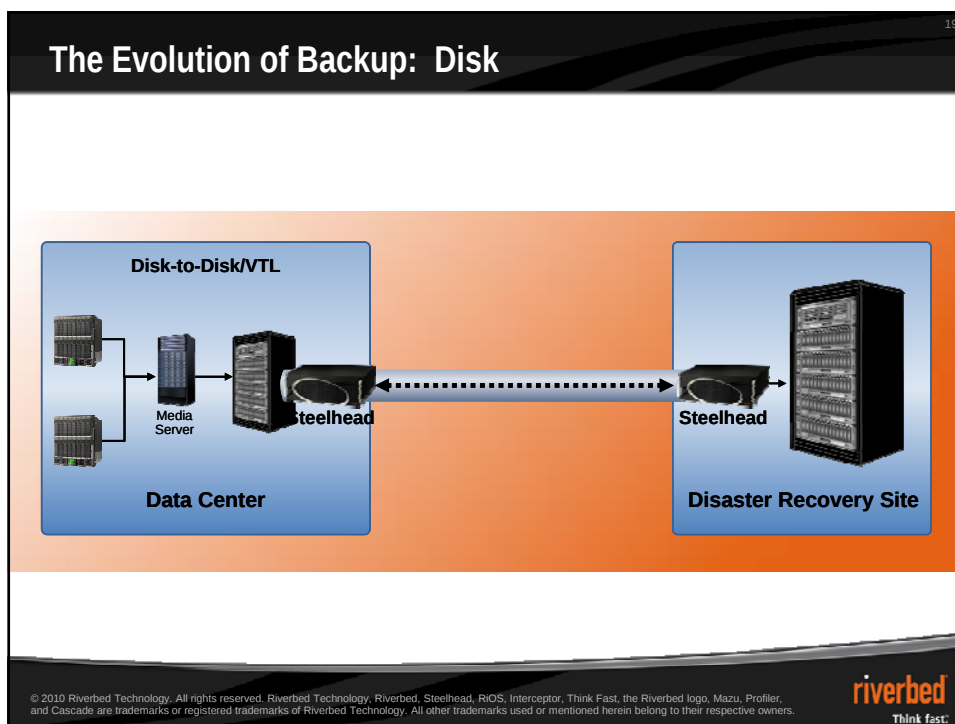
18

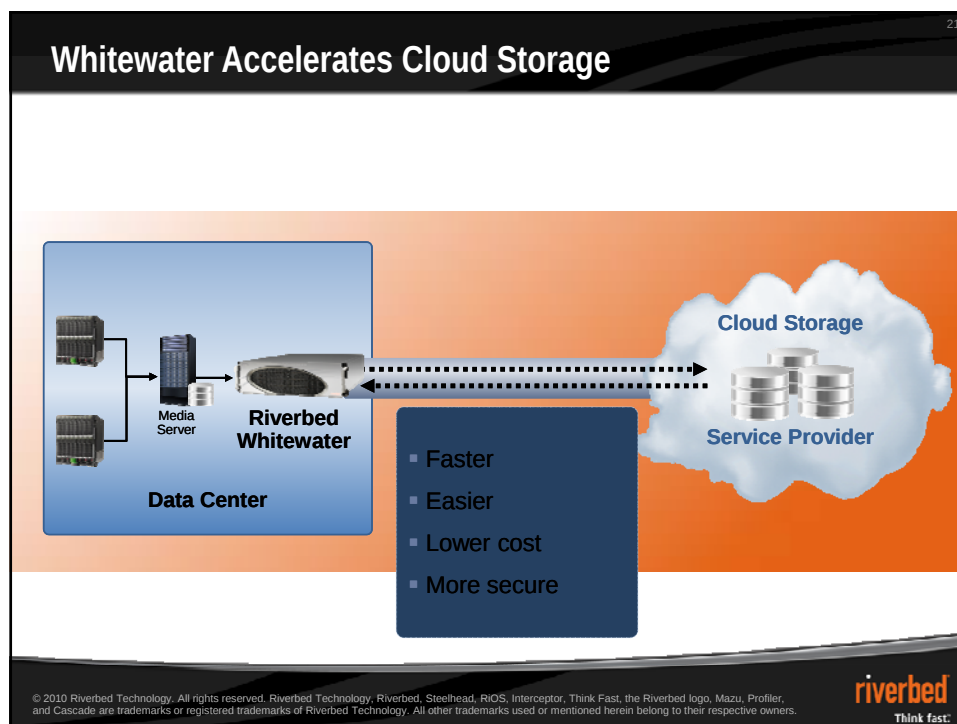
The Evolution of Backup: Tape



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