



Rethinking Backup in a Virtualized World

The Public Sector Experts

- Enterprise solutions exclusively for K12, Higher Ed, and State and Local Government
- More than 100 highly-qualified engineers and technicians
- Leverage strong relationships with leading manufacturers to deliver single-source simplicity
- An industry-recognized leader for nearly 30 years



Recent Awards

- CRN Tech Elite 250 (*CRN*)
- Top 100 Solution Provider (*GovernmentVAR*)
- Education Solution Provider of the Year (*GovernmentVAR*)
- Top 500 list of Value Added Resellers (*VARBusiness*)

Today's Agenda

- Trends
- Backup Challenges for Virtualization
- Technical Approaches to Backup
- What to Look for in a Virtual Backup Solution
 - Global De-Dupe and Block-Level Compression
 - Granular Recovery Testing and Verification
 - Data Replication
 - Unified Management
- Questions



Server Virtualization Benefits

IDC Survey conducted January 2012

- 25% - 30% Servers Virtualized January 2012
- Expect number to rise to 50% by December 2012

Virtualization Benefits

- Increases uptime
- Reduces cost
- Faster server provisioning
- Smaller data center foot print
- Saves energy, go green

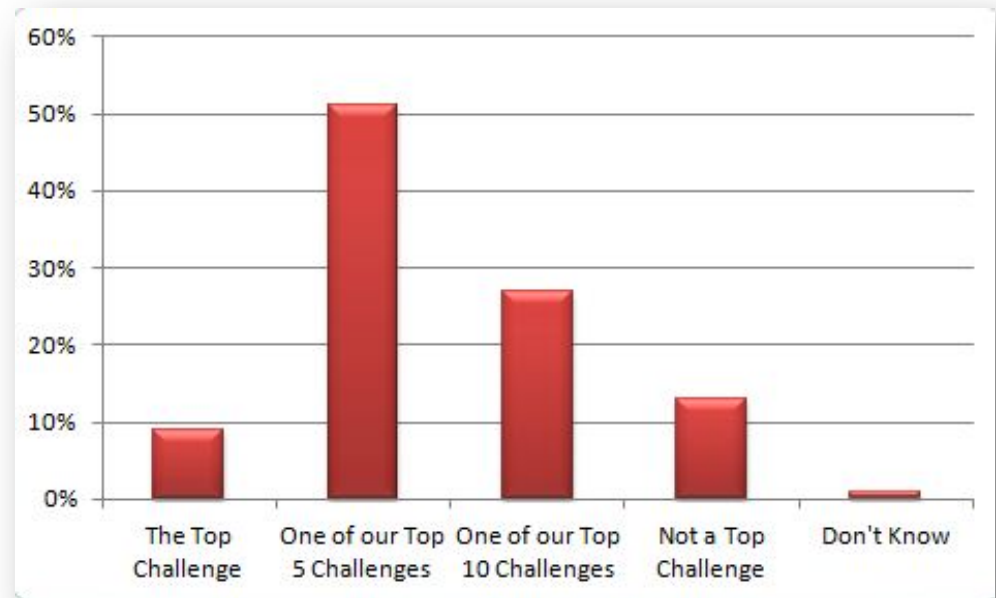


Source: IDC 2012

IT Challenges

- 60% of respondents rated protecting virtual environments one of their top-five data protection challenges
- Only 13% didn't perceive data protection as a top challenge

ESG Research Survey 2012 Results



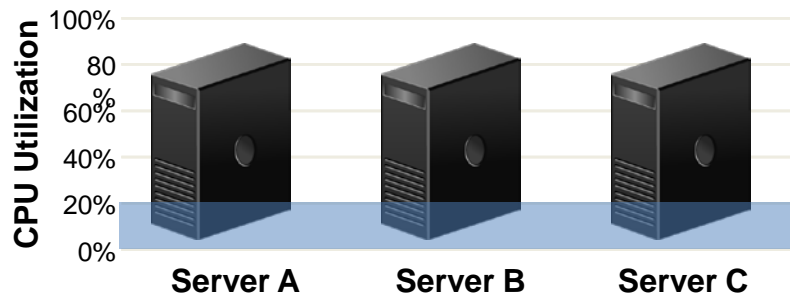
Source: Enterprise Strategy Group, 2012
ESG Research Survey

Virtualization Changes the Paradigm

Virtualization changes server, application, and information paradigm...

Old Paradigm

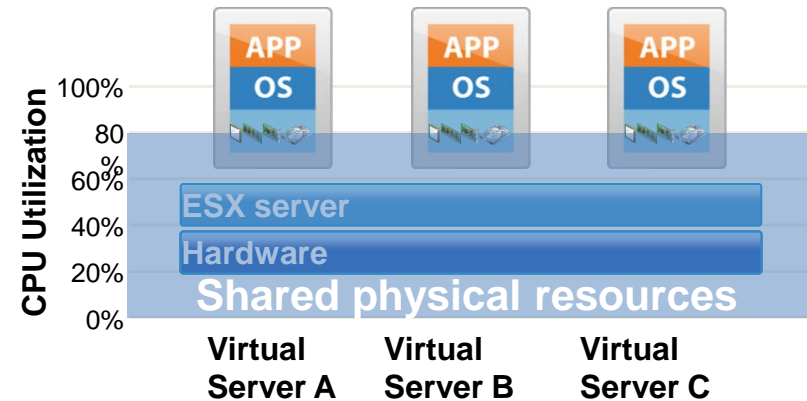
Physical environment: Low overall server utilization and plenty of CPU Cycles for backup



20% resource utilization

New Paradigm

Virtual environment: High overall server utilization and little CPU Cycles for backup

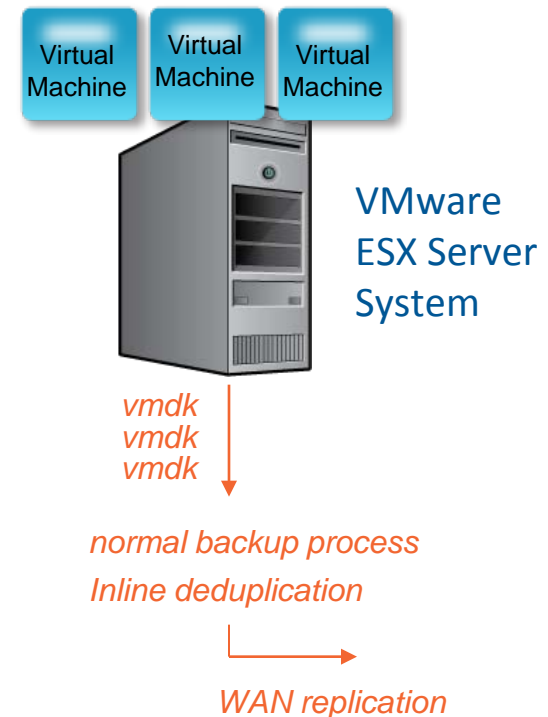


80% resource utilization

Server Virtualization Creates Special Backup Challenges

It's a Lot Easier to Add Virtual Machines than Support Them

- Virtual server “sprawl”
- Increased storage requirements
- Highly redundant data (VMDK plus Guest OS files) with low change rate
- Bandwidth and server performance impacted by simultaneous backups on same physical server
- Virtualization strategies often limited by storage capacity



VMDK File Structure

- One per VM
- Large 2GB+ File Size
- Includes many empty blocks

Traditional Backup Doesn't Work For Virtual Environments

Cost and Complexity

- Agent-based license costs rise
- Risk of missing VMs
- Agentless tools more flexible

Performance Issues

- Contention with other VMs
- Backup window constraints
- Not build for virtual infrastructure

Lack of File Access

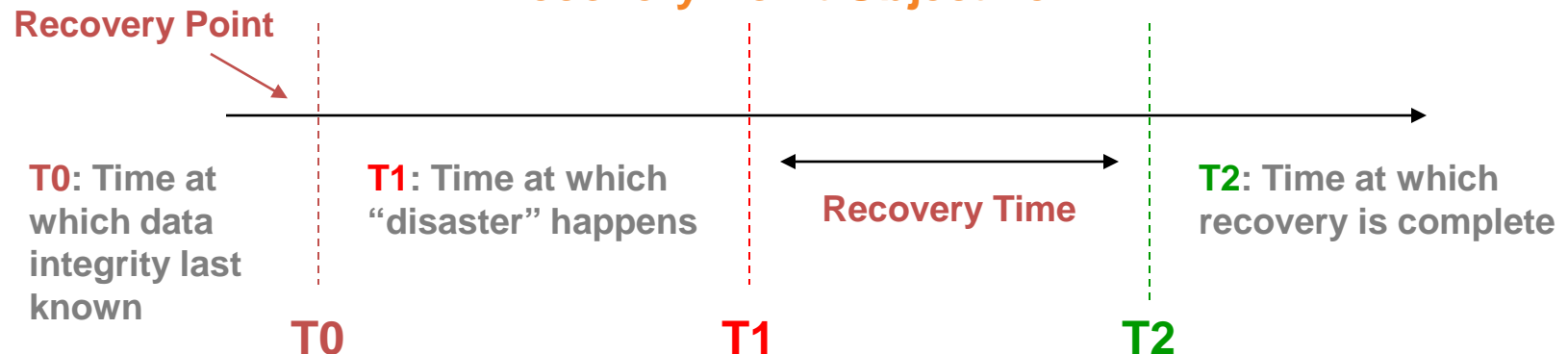
- Makes restores more difficult
- Restores can take longer
- Dependent on proprietary formats

It's all about RTO and RPO

Recovery Time Objective



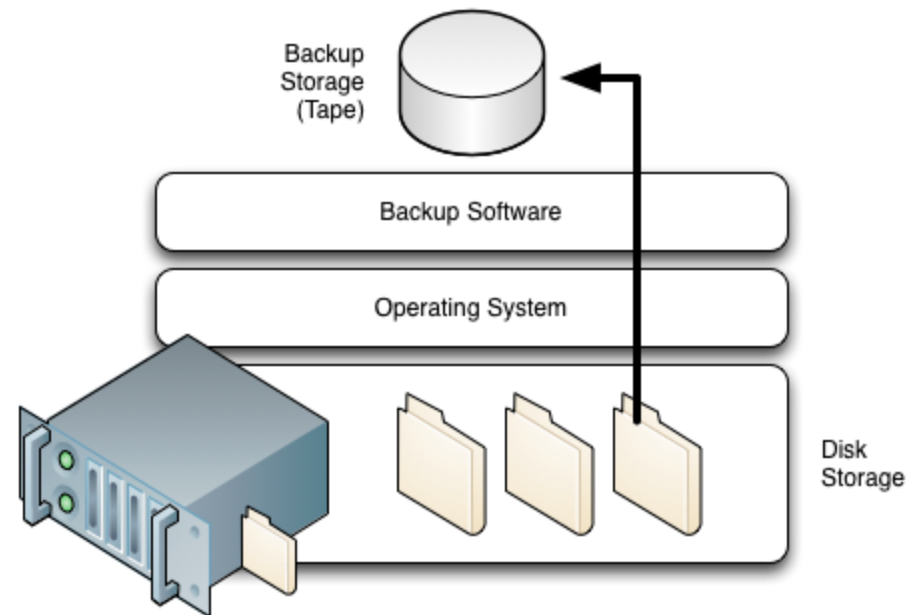
Recovery Point Objective



Technical Approaches to Backup

1 Backing up Files

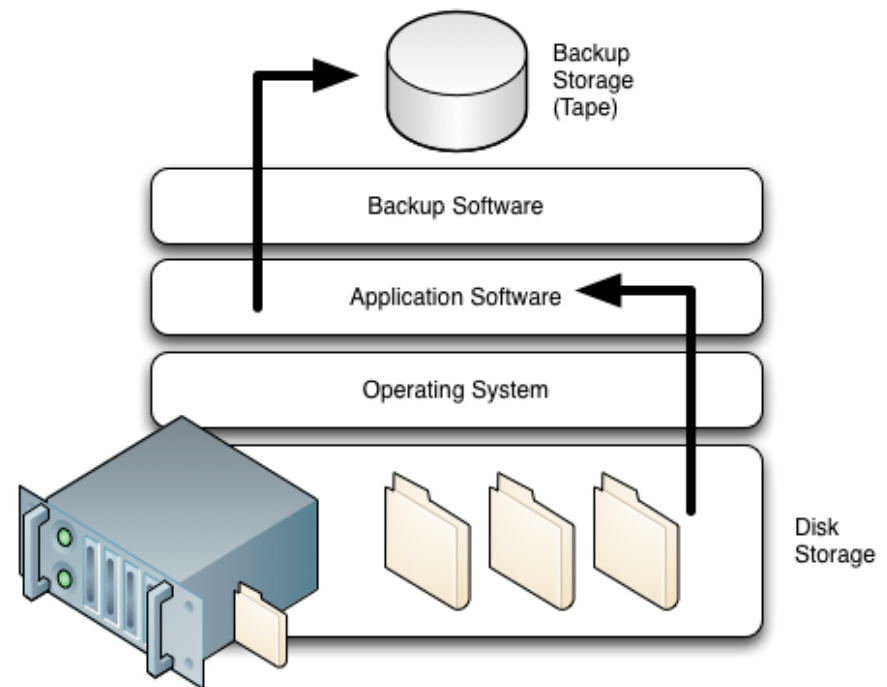
- Backup made by backup software
- Small agents communicating with external BU server
- BU software requests file access from the operating system
- OS provides access to files at a high-level of abstraction
- BU software is ignorant of how file is stored or what it contains



Technical Approaches to Backup

2 Backing up Data

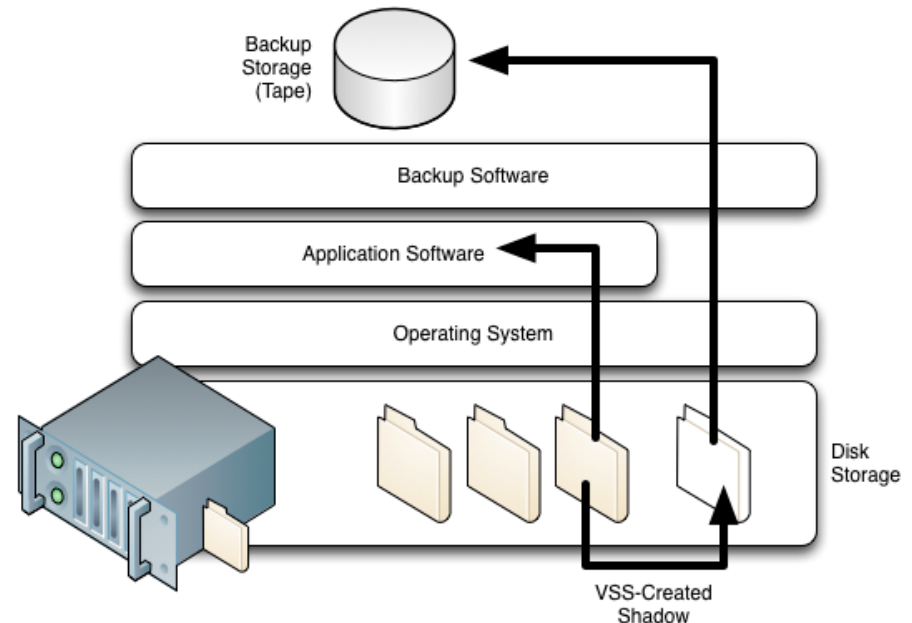
- Traditional file-based backup doesn't work for databases
- Software vendors added a vast array of application specific backup agents
- Operating system still provides access to the files on disk exclusively to the application software – SQL, Exchange, etc.
- Application software provides the access to the data within the files to backup software



Technical Approaches to Backup

3 Dealing with Open Files

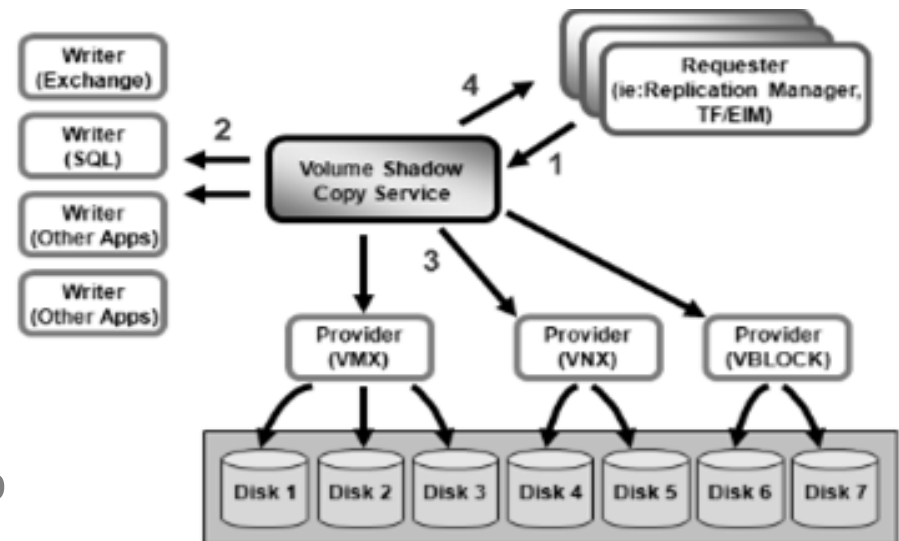
- Attempts have been made to enable backups for always-open files - Microsoft's Volume Shadow Copy Service (VSS)
- Operating system, via the VSS, makes a “shadow copy,” or independent snapshot
- Backup software then backs up the snapshot



Technical Approaches to Backup

4 Backing Up Virtual Machines

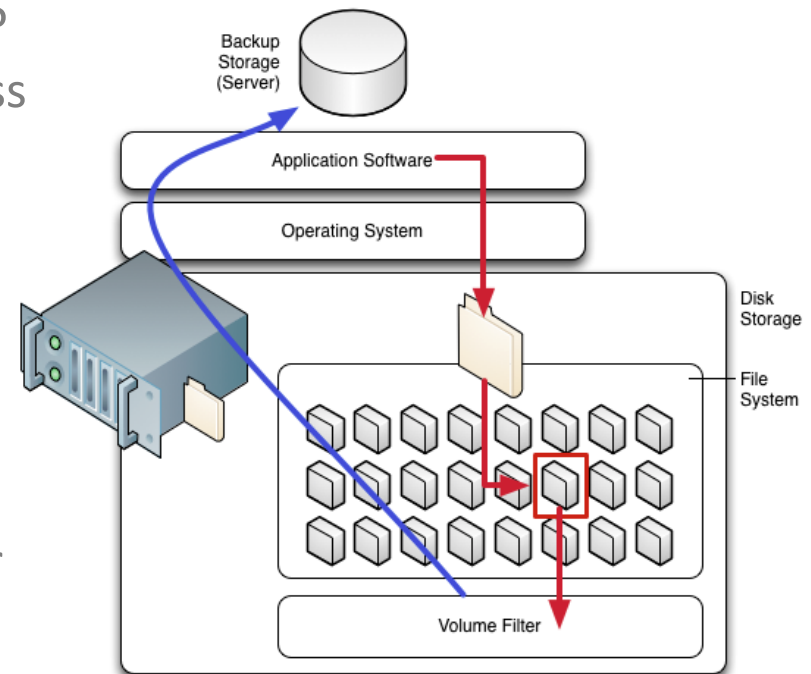
- VSS approach is often used to backup entire VM disk files from the virtualized host
- Hypervisor is informed by VSS that a snapshot is required
- Hypervisor gets its files to a consistent state
- VSS takes the snapshot, the backup solution backs it up



Technical Approaches to Backup

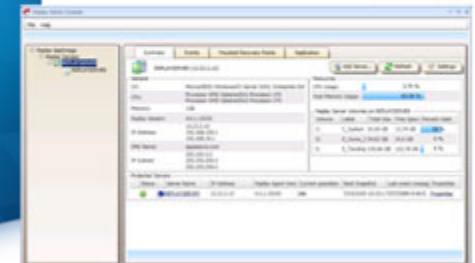
5 Backing Up Disk Blocks

- The common factor for Approaches 1 – 4? Relies on operating system file-level access
- Alternate approach? Back up disk blocks
- Registering itself as a volume-level filter with the file system allows the backup software to see a copy of every disk block-level change
- Changes are replicated to a backup server then time-stamped, compressed, de-duplicated, and saved to disk

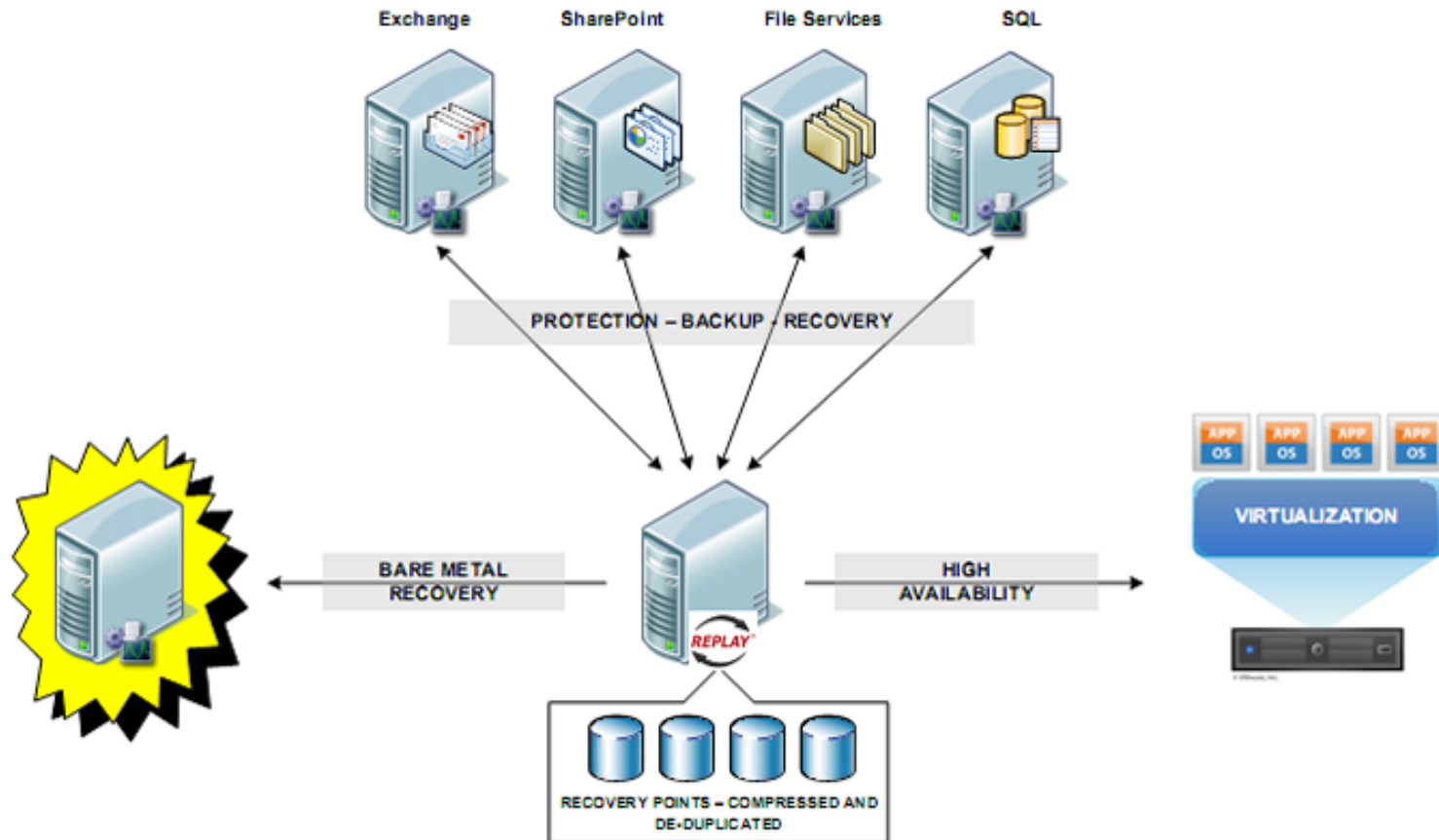


What to Look for in Virtual Backup Solution

- ✓ Physical server and multi-hypervisor support
- ✓ Global de-duplication
- ✓ Block level compression
- ✓ Granular recovery testing and verification
- ✓ Data replication
- ✓ Unified management



Introduction to AppAssure 5



AppAssure 5 Architecture

Management Services						
Recovery Services	Live Recovery	Universal Recovery	Recovery Assure	Retention	WAN Optimized Replication	Archiving
True Scale Layer	Global De-duplication		Encryption		Compression	
Volume Manager						
Physical Storage	Scalable Object Store		Scalable Object Store		Scalable Object Store	Scalable Object Store
	Storage Area Network		Direct Attached Storage		Network Attached Storage	Cloud Storage

Physical Servers and Multi-Hypervisors

Physical Servers

- Microsoft Windows XP; Vista; 7; Server 2003; Server 2008; Server 2008 R2
- Linux: Red Hat RHEL 6.3; CentOS 6.3; Ubuntu 12.04 LTS; SuSE Linux Server 11 SP2

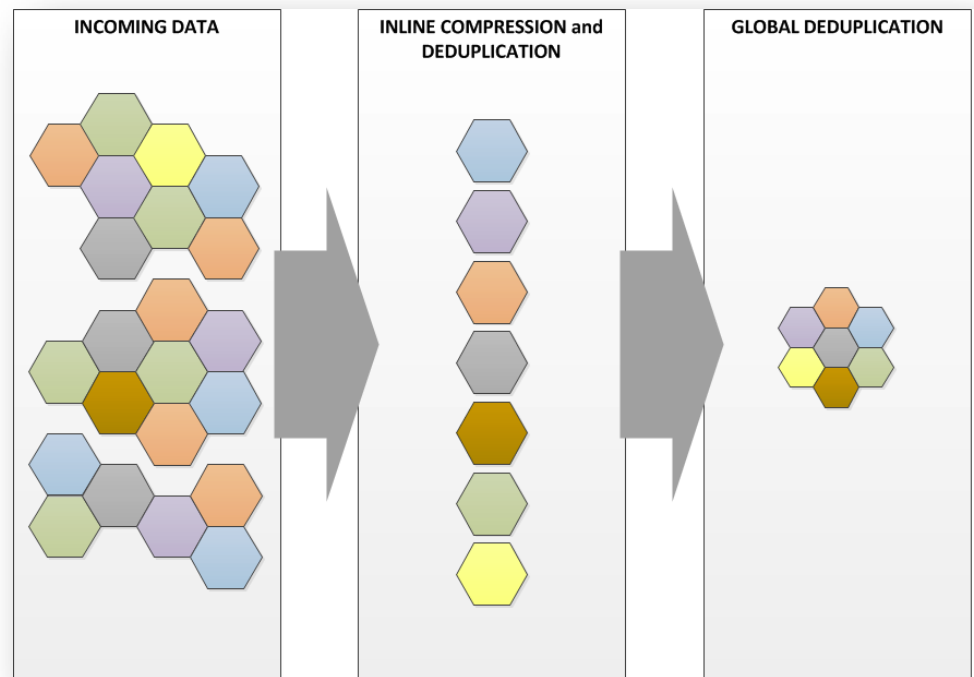
Hypervisors

- VMware ESX/ESX (i)
- Microsoft Hyper-V
- Citrix XenServer



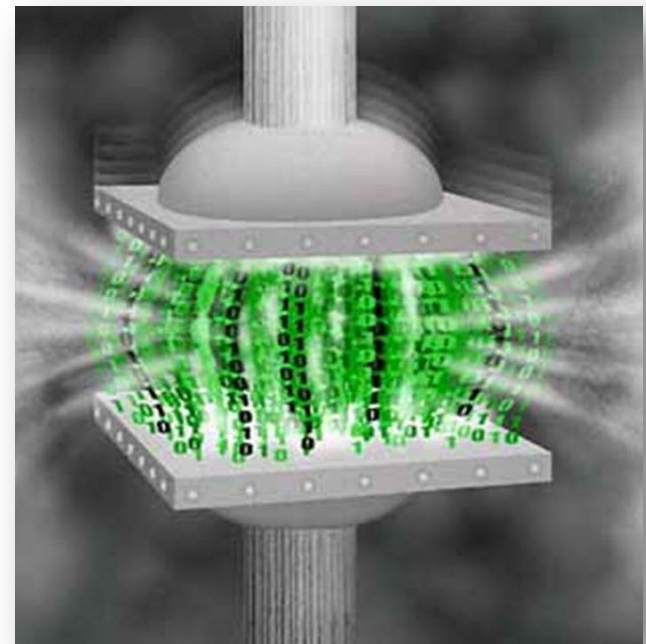
Global De-duplication

- Incremental block-level backups
- Line-speed performance
- Configurable block sizes
- Built-in checksums to auto-correct and prevent data corruption for data-at-rest and data-in-flight
- Space reduction ratios exceeding 80:1



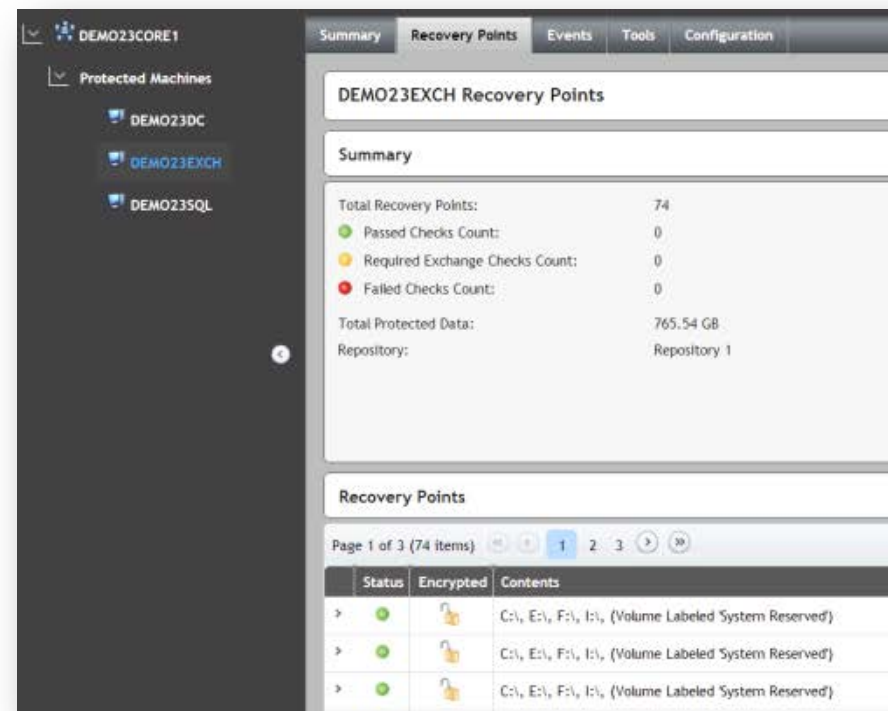
Inline Compression

- Data is compressed as it's stored
- Improves IO efficiency
- Reduces storage use
- Lowers storage costs



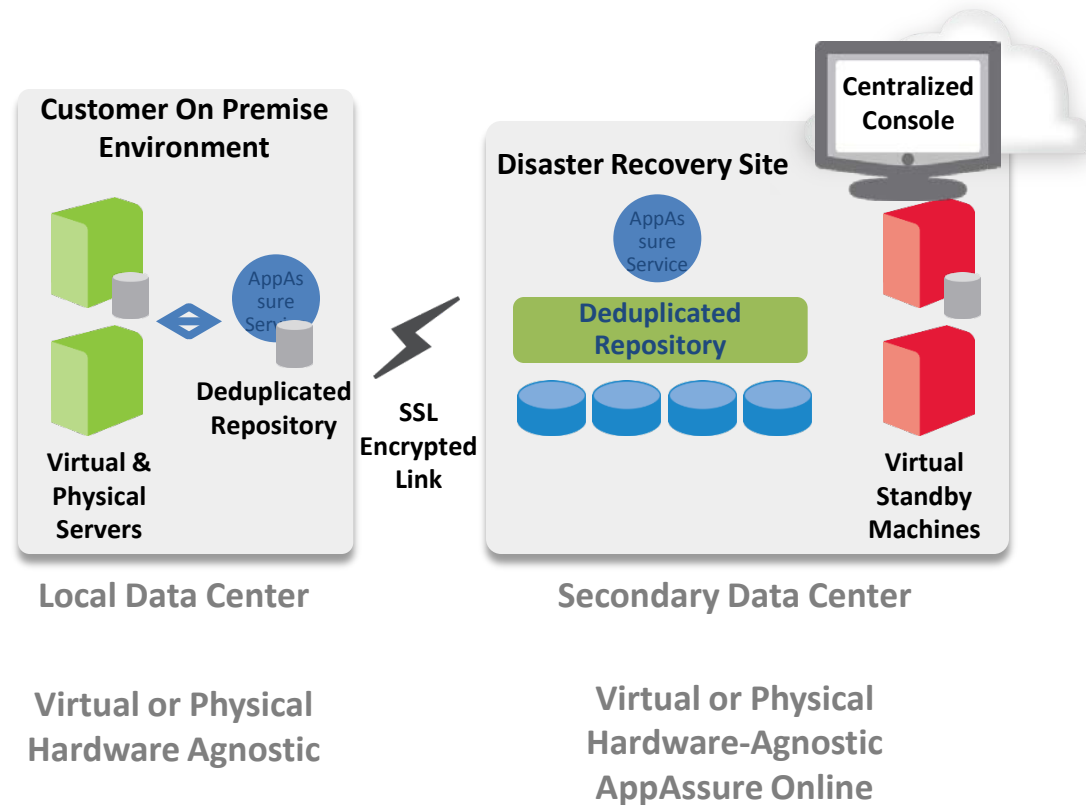
Granular Recovery Testing & Verification

- Discovers applications and adds validation tests automatically
- Status of backup up data objects displayed in GUI
- Mount and share disk images from any protected machine using any restore point for application-level data recovery
- Cross platform recoveries P2P, V2V, V2P, P2V



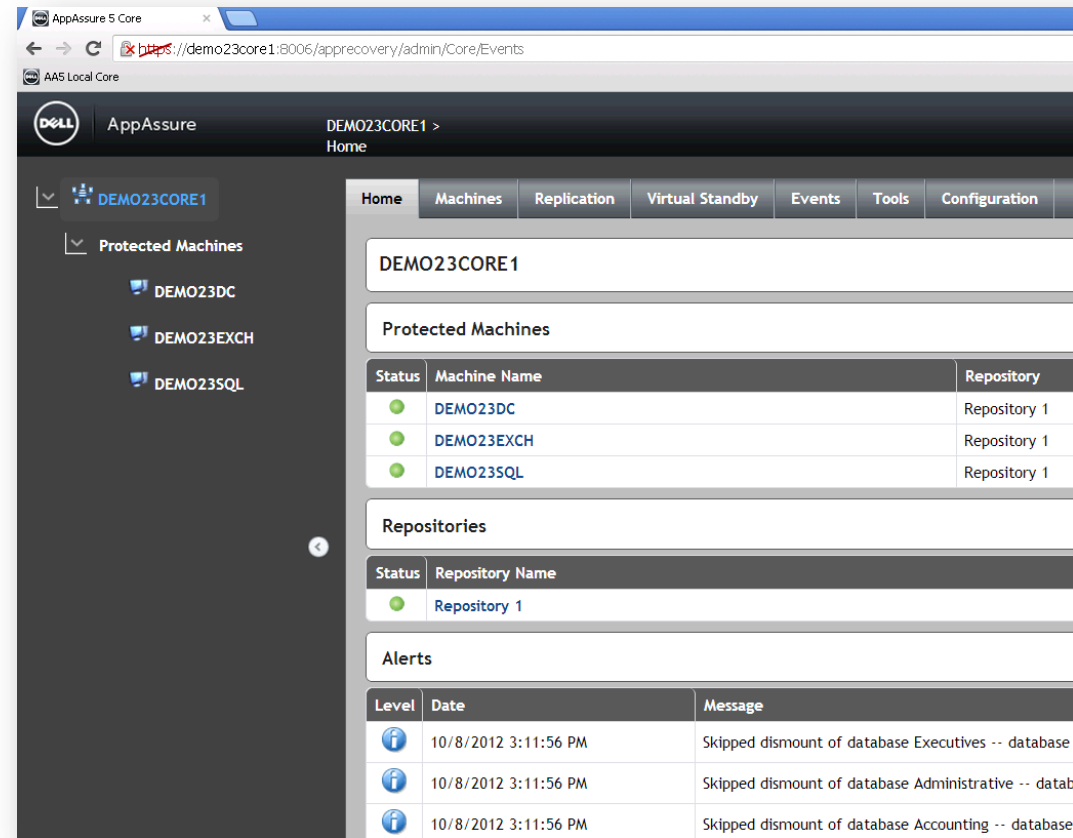
Data Replication

- Copies recovery points and transmits to secondary location
- Requires paired source-target relationship between two cores
- Managed on a per-protected machine basis
- Source core synchronously and continuously transmit incremental snapshot data to the target core



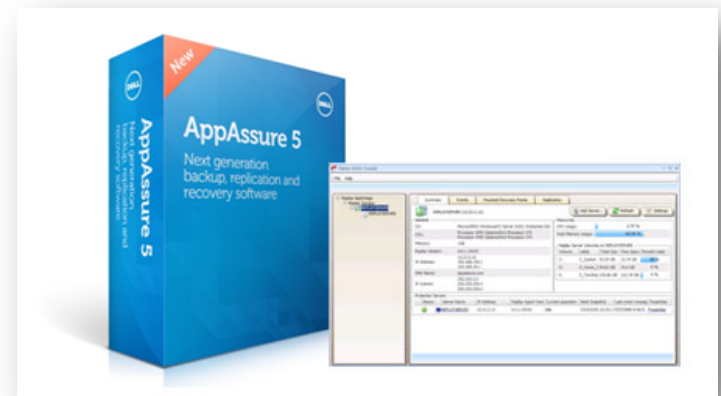
Unified Management

- Single pane of glass for VMs and physical servers
- Web-based user interface compatible with industry standard browsers
- Intuitive graphical interface for ease of use



AppAssure 5 Licenses

- Physical Servers
 - File Server or SBS Server
 - Exchange Server
 - SQL Server
- Virtual Servers
 - VMware
 - Hyper V
 - XEN Server
- Maintenance 25% of licensing cost



AppAssure 5 Licenses

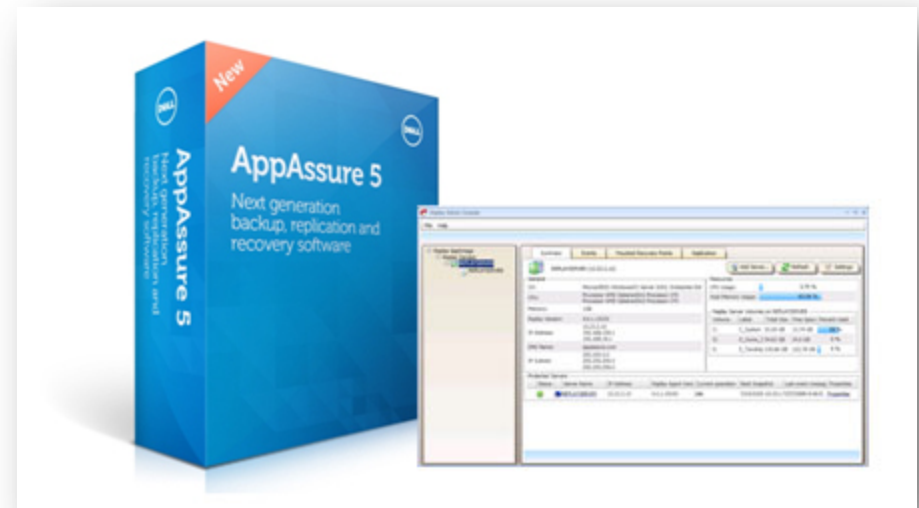
- AppAssure Backup and Replication for Window Servers
 - Windows Server 2008, 2008 R2, Windows Server 2003
 - Priced per physical server
- AppAssure Backup and Replication for Exchange Server
 - Continuous Exchange Health Monitoring, Message Level
 - Recoveries Unlimited mailboxes
 - Priced per physical server
- AppAssure Backup and Replication for SQL Server
 - Includes Automated Recovery Testing
 - Priced per physical server
- AppAssure for Backup and Replication for SBS Server
 - Built-in support for Exchange and SQL
 - Priced per physical server

AppAssure 5 Licenses

- AppAssure Backup and Replication for Hyper V
 - Supports unlimited virtual guests per host,
 - Includes SQL, Exchange, & SharePoint recovery
 - Priced per Hyper V Host
- AppAssure Backup and Replication for VMware
 - Supports unlimited virtual guests per host,
 - Includes SQL, Exchange, & SharePoint recovery
 - Priced per VMware Host Sockets
- AppAssure Backup and Replication for XEN Server
 - Supports unlimited virtual guests per host,
 - Includes SQL, Exchange, & SharePoint recovery
 - Priced per XEN Server

AppAssure 5 Licenses

- AppAssure for Backup and Replication for Windows Desktops
 - Supports Windows 7, Vista and Windows XP SP3 or Greater
 - Priced per physical desktop
 - Available individually or in 100 pack



How Data Networks Can Help



Analyze

All necessary analysis and a low-cost Readiness Assessments for a great start



Design

A solution that seamlessly integrates with your current environment based on your needs



Implement

Trained, specialized and local engineering staff with the most advanced technical certs available



Manage

Proactive IT Support Solutions that will keep your network running at peak performance



The Logical Approach™

Thank You!

More Information

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