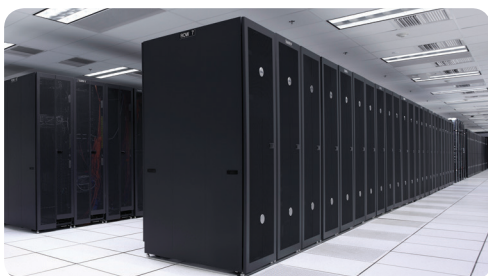




Dell AppAssure 5: Beyond backup



Backup, Replication and Recovery Software

- Maximize your storage efficiency and footprint
- Improve system utilization and performance with proactive reviews and evaluations
- Keep business strategy and storage requirements continually aligned

Key Advantages of AppAssure data protection

Big data scale

AppAssure 5 delivers superior backup performance through a new multiple-core backup processing technology (TrueScale™) that accelerates backups to whatever speed you require, up to communications line speed. With this enhancement and the arrival of AppAssure's new, built-in global deduplication and compression, you are equipped with all the resources you need to tackle even Big Data without having to over-buy disk storage.

Rapid and flexible recovery

AppAssure 5 shines on recoveries too, delivering aggressive, near-zero application recovery time objectives (RTO). It over-performs when it comes to the granularity of its recovery point objectives (RPO) too. You can specify snapshots as frequently as every five minutes to effectively eliminate the potential for data loss. Legacy backup system users who are limited to only being able to back up once a week or once a day will find AppAssure's highly granular recovery time flexibility a welcome revelation.

Reliable recovery

Integrated replication and daily verification of both data and application integrity through AppAssure's Recovery Assure™ technology.¹ Recovery Assure validates recoverability of critical data in the event of a disaster.

Protect continuously, move anywhere and recover everything

AppAssure 5 offers a better way to protect your complex data environment. IT data centers, whether they're a few servers in a storefront office or thousands of virtual and physical machines, are harder to protect, especially as they are spread across local, offsite and—increasingly—cloud resources. With all this complexity, it's no wonder that traditional backup approaches cause serious problems. For instance, they:

- Require more administrative intervention than you may have time for
- No longer fit into short backup windows
- Can't assure that you will be able to recover in a reasonable timeframe.

A better way to protect Windows and Linux environments

AppAssure 5 answers these concerns with fast, backup and even faster replication and recovery. As a key data protection element of Dell's Fluid Data™ Architecture, AppAssure 5 controls cost, optimizes performance and enhances protection by unifying backup, replication and recovery within a single solution. All this capability comes complete with a truly easy-to-use management interface that automates daily backup activities, freeing you to tackle other projects.

AppAssure 5 ensures that you'll return to productivity in a hurry. It goes beyond backup by establishing a new, highly automated standard for data protection. AppAssure 5 includes our premium software support, Dell ProSupport™, providing you with 24x7 and global access to technical experts ready to assist you if the need arises. With AppAssure 5 you can protect continuously, move anywhere and recover everything.

¹ Created for protecting Windows applications

How is AppAssure Different?

AppAssure 5 delivers innovative AppAssure Core technologies to create fast and reliable backups and recoveries across virtual, physical, and cloud environments:

1. TrueScale™ Architecture for Data Protection: NEW

AppAssure's TrueScale™ Architecture for Data Protection leverages a dynamic, multi-core pipeline storage system that scales linearly to store and manage data efficiently and deliver RTOs and RPOs of minutes.

Recovery Service	Management Services					
	Line Recovery	Universal Recovery	Recovery Assure	Retention	WAN optimized Replication	Archiving
TrueScale Layer	Global Deduplication		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

2. Global Deduplication and Compression: NEW

Save storage costs through integrated, inline deduplication and compression while optimizing backups for WAN replication. It eliminates redundant data from your backups not just locally, but across your entire network.

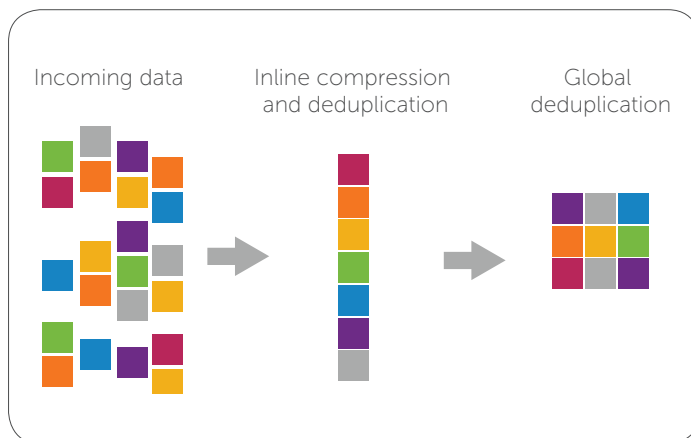


Figure 1: Global Data Deduplication uses far less data storage

3. Universal Recovery™: To any VM or Server

AppAssure was built from the ground up for virtual and physical environments, enabling one of the fastest and most flexible recovery procedures possible—in minutes, not hours or days, with a near-zero RPO. AppAssure provides full bare-metal recovery to dissimilar hardware and VM servers in seconds as well as granular recovery of individual objects, applications, files or messages, in just minutes.

Combined, these technologies deliver fast, reliable and secure local recoveries and cloud-enabled disaster recovery. With its scalable object store, AppAssure 5 is uniquely capable of handling exabytes of data or more very rapidly with built-in global deduplication, compression, encryption, and replication to any private or public cloud infrastructure. Flexible enterprise data retention policies are supported for recovery and compliance purposes.

One interface for virtual and physical machines

AppAssure combines technologically innovative software with ease of use to substantially reduce IT management and storage costs across every Windows and Linux machine in your IT environment. In addition to backing up and recovering physical machines, AppAssure 5 supports multiple hypervisor environments in private and public clouds. AppAssure 5 adds the ability to directly create Hyper-V machines from your backups, a feature AppAssure 4 first offered for VMware ESX/ESXi machines. And it supports larger virtual environments with features like support for SQL Clusters.

Attractive Total Cost of Ownership (TCO)

AppAssure 5 comes with an ownership cost that is very attractive to organizations that currently pay for and manage two or more unrelated software programs and costly add-on modules. All the data protection you need is delivered in one product, controlled with one interface. Administrators no longer have to learn and master multiple backup and recovery schemes; instead they interact with a single pane of management glass that includes all the tools needed to protect their machines, regardless of their location. With AppAssure 5 you save time and money.

Premium Software Support. AppAssure 5 includes Dell ProSupport™ with access to expert back-up and recovery technicians around the clock and around the globe. Customers receive 24x7 phone support* around the world from more than 30,000 technicians supporting over 100 countries in 55 languages.

Remote Installation Services. AppAssure software is easy to install but if you're feeling like you could use some extra hands, our expert technicians can help. We'll get you up and running quickly with minimal effort with our remote installation package options: Basic Remote Installation Service or Advanced Remote Installation Service.

Remote Advisory Services. Consultation with a highly-qualified certified expert regarding upgrades or system updates is also available via our [Remote Advisory Services](#).

Data off-siting and disaster recovery

WAN Optimized Replication

AppAssure 5 offers new WAN-optimized, deduplication-aware replication for off-siting data to public or private clouds.

SmartAgent with incremental-forever approach for VMs and physical servers

AppAssure's Smart Agent is automatically installed on all the machines that will be protected by the AppAssure 5 Core. Smart Agents are designed by AppAssure to offer a number of advantages over both legacy agent-based and agentless technologies found on other backup products.

SmartAgents use an incremental-forever, changed-block-tracking approach that tracks, captures and transmits the changed blocks from the protected disk volume to the AppAssure core at pre-configured intervals. They are fully application-aware and they lie dormant when not in use.² Even when they're hard at work, the ultra-light SmartAgents tread lightly.

An RMW algorithm is tightly coupled with deduplication; the two cores match keys before transferring data, and then replicate only the unique blocks that are compressed- encrypted-deduplicated across the WAN. This can result in up to a 10X reduction in bandwidth requirements. All data-in-flight is replicated over SSL connections.

Data Seeding

Getting data offsite is a critical first step to prepare your company for disaster recovery. AppAssure 5 allows you to seed your baseline data to an offsite target core if the cores are separated by a slow or highly latent links. The data in the seeding archive is compressed, encrypted and deduplicated. If the total size of the archive is larger than the space available on the removable media, the archive can span across multiple removable media devices based on the available space on the media. During the seeding process, incremental recovery points are replicated to the target site. Once the seeding archive is consumed into the target core, the newly replicated incremental recovery points are automatically synchronized.

Virtual Standby

Create and maintain an up-to-date virtual standby VMware or Hyper-V machine for fast disaster recovery for all of your Windows workloads including Exchange, SharePoint and SQL. The bootable virtual machine is an exact clone of the production server as of the last snapshot.

Fail-Over and Fail-Back

If the worst occurs and you do suffer a data disaster, AppAssure 5 supports fail-over and fail-back in replicated environments. In case of a comprehensive outage, the target core in the secondary site can recover instances from replicated machines and immediately commence protection on the failed-over machines. Once the primary site is restored, the core can "fail-back" protection to the machines at the primary site.

Built in Replication Workflows

Outbound replication can be configured to a self-managed core or a managed service provider offering off-site backup and/or a disaster recovery service. Customers who wish to replicate to managed service providers can use built-in workflows that allow them to request connections and receive automatic feedback notifications.

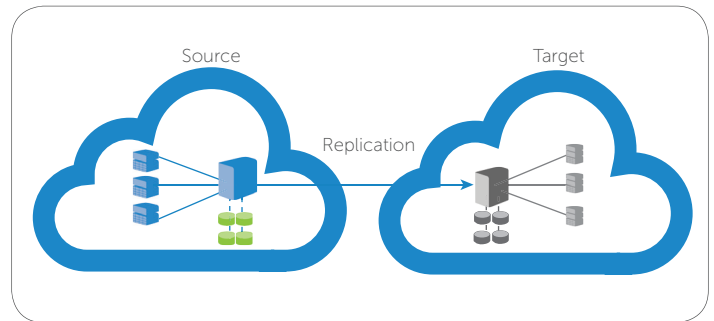


Figure 2: Replication process includes government-grade encryption

Encrypted Communications

AppAssure 5 provides built-in encryption using 256-Bit Advanced Encryption Standard (AES) with cipher block chaining (CBC) algorithm compliant with SHA-3 to protect the backups from unauthorized access or use, and ensure data privacy. The technology performs inline encryption on incoming snapshot data at line speed without impacting performance and scalability.

AppAssure 5 uses SSL 3.0 to secure the connections between the two cores in a replication topology to prevent eavesdropping and tampering.

²Application awareness applies to Microsoft Exchange and SQL applications

Long term data retention

Archiving

AppAssure 5 SmartArchive feature enables long-term data retention for SLA and regulatory compliance. The backup archives can be created on less expensive storage. An archive can be created on the source or a target replica core on to removable media. It is internally optimized and all data in the archive is deduplicated, compressed and encrypted. The archive can span across multiple devices based on the available space on the media and it can be locked with a passphrase. Recovery from an archive does not require a new core—any core can ingest the archive and recover data as long as the administrator has the passphrase and the encryption keys.

Retention Policies

AppAssure 5 offers highly flexible and granular backup retention policies that can be easily customized for different business and compliance requirements without compromising availability or the integrity of the backups. Customers with Big Data can now rely on AppAssure 5 to retain very large amounts of data with complex retention policies by using metadata operations to perform rollup operations for aging.

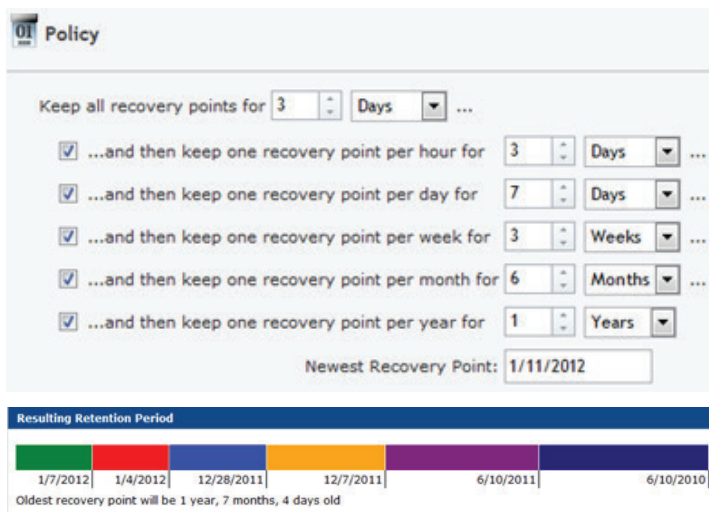


Figure 3: Retention policies are easy to set

Smart Agents for efficiency

SmartAgent with incremental-forever approach for VMs and physical servers

AppAssure's Smart Agent is automatically installed on all the machines that will be protected by the AppAssure 5 Core. They consume less than 20MB for memory efficiency. And, their impact on CPU utilization of backed up machines is a mere 1% – 3%. This means backups won't slow user applications.

Protecting Windows environments

Complete Windows application protection

AppAssure 5 delivers two innovative application-aware technologies that do much more than simply back up machines and their data.

Recovery Assure™ detects the presence of Microsoft Exchange and SQL and its respective databases and log files and automatically groups the volumes with dependency for comprehensive protection and rapid recovery. This ensures that you never have incomplete backups to work from when you are performing recoveries.

When you back up MS Exchange or MS SQL instances, AppAssure 5 not only captures the entire application stack including files and logs, it also tests your backup to determine if it is 100% recoverable. AppAssure 5 can also notify you if the testing fails, giving you another opportunity to back up before disaster strikes.

Live Recovery™: Instant Recovery

Restore an entire server from your backup with an RTO of minutes rather than hours. Recover the use of a server to any location from the backup file directly onto any virtual or physical machine without having to wait to extract the full backup to production storage. Choose from as many as 288 recovery points a day to deliver an RPO of minutes.

Linux system protection

AppAssure Agent for Linux is an innovative Linux backup and recovery product that can be managed centrally from a single user interface. After completing an initial full backup, take advantage of incremental forever block-level snapshot backups with change block tracking. This feature allows each Linux machine to be 'snapped' and backed up much more frequently than traditional backup architectures allow and it yields outstanding disk storage efficiency.

Cuts backup windows and speeds restores

AppAssure cuts Linux backup windows from hours to just minutes for better recovery point objectives (RTOs) and it restores in minutes to deliver superior recovery time objectives (RPOs).

- Continually protects multiple servers per AppAssure core
- Linux server bare-metal restores and disaster recovery
- Web-based interface that is easy to use

Here are the key functions found in AppAssure agent for Linux:

Continual snapshots for outstanding recovery point objective (RPO) granularity

AppAssure agent for Linux snapshot technology essentially eliminates backup windows with disk-to-disk backups comprised of an initial full backup, followed by incremental

forever backups. This allows administrators to back up a server as frequently as every 15 minutes. This creates many more RPOs than traditional backup technologies are capable of and reduces potential data loss from as much as a day to just minutes.

Centralized backup

AppAssure manages your Linux servers from a Web-based central management console that runs on a Web browser-enabled device.

Fast recoveries

AppAssure is the fast path to recoveries with bare metal restores that take minutes, rather than hours. It eliminates the need for time-consuming manual system rebuilds followed by file restores. A recovery that once took hours can now be accomplished in just minutes.

AppAssure's archiving feature enables long-term data retention for SLA and regulatory compliance. The backup archives can be stored on low-cost storage. Archive data is deduplicated, compressed and encrypted, and spans across multiple devices.

Management

Web-based User interface

AppAssure 5 features a new Web-based user interface that is compatible with all industry-standard browsers. It is highly intuitive to increase user efficiency.

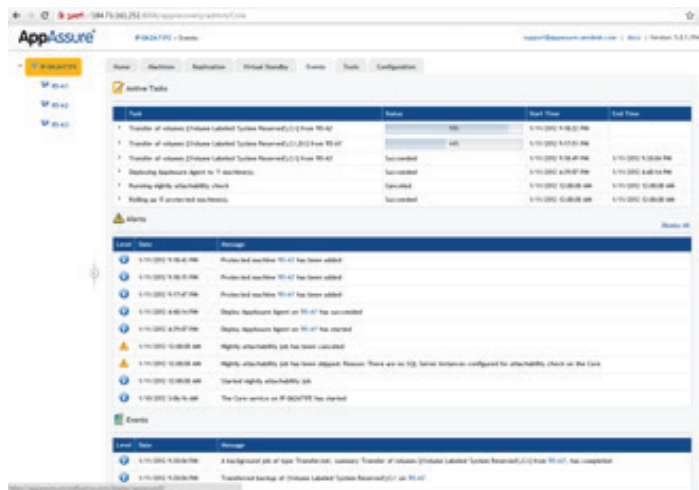


Figure 4: Set up backups or manage recoveries from any browser-enabled tablet, netbook or PC.

API

AppAssure 5 comes natively bundled with a service management API that provides programmatic access to all of the functionality available through the Management Console. The management REST API can be used for managing your services and deployments.

PowerShell Scripting

Windows PowerShell is a Microsoft .NET Framework-connected environment designed for administrative

automation. AppAssure 5 includes a comprehensive client SDK for PowerShell scripting that helps administrators automate administration and management of AppAssure 5 resources to execute commands either directly or through scripts.

License Portal

The AppAssure 5 license portal provides easy-to-use tools for managing license entitlements. You can download, activate, view, and manage license keys and create a company profile to track your license assets. Additionally, the portal makes it easier for service providers and resellers to track and manage customer licenses.

Event log monitoring and management

AppAssure 5 provides an effective way to log and alert administrators about the state of completion for ongoing tasks. Event alerts are generated at a very granular level and they can be logged in the windows event log, delivered to administrators using mail, or even sent to a syslog server. Administrators can create groups for notifications based on servers, tasks or events.

Central Management Console

A Web-based Central Management Console simplifies the process of managing and reporting on AppAssure 5 Cores that are distributed across an environment. The console also provides role-based access for central management, allowing you to control the objects that users can access in an AppAssure 5 environment.

Reporting

AppAssure 5 features comprehensive reporting for all ongoing activities. Reports are created dynamically and they can report on all protected machines—virtual or physical—across all your sites. A report can be generated by connecting to a core or from the central management console. The generated reports are available in different formats such as PDF, CSV, HTML and Excel.

Virtualization and cloud

VMware™, Hyper-V™ and XenServer™ support

AppAssure 5 can export any protected or replicated machine to VMware or Hyper-V. Exports can be ad hoc or continuous. With continuous exports, the virtual machine is incrementally updated after every snapshot. The incremental updates are very fast, so standby-clones are ready to power up with a click of a button. The formats for export are VMware Workstation/Server on a folder, direct export to Vsphere/VMware ESX(i) host or Microsoft Server 2009/R2 and 2012 Hyper-V and Citrix XenServer.

AppAssure 5 also adds significant clustering support for VMware and Hyper-V environments to meet the backup needs of mid-size and larger companies. Support is now available for Database Availability Groups, Single Copy Clusters, SQL Single Copy Clusters.

AppAssure Core	
Operating system	<ul style="list-style-type: none"> • Microsoft Windows 7 • Microsoft Windows Server 2008 • Microsoft Windows Server 2008 R2 • Microsoft Windows Server 2012
Architecture	<ul style="list-style-type: none"> • 64-bit only
Memory	<ul style="list-style-type: none"> • 8 GB or Higher. AppAssure highly recommends using ECC Memory, to ensure optimum performance of AppAssure core servers
Processor	<ul style="list-style-type: none"> • Quad-Core or higher recommended for better performance
Storage	<ul style="list-style-type: none"> • Direct Attached, Storage Area Network (SAN) or Network Attached Storage (NAS)

AppAssure 5 central management console	
Operating system	<ul style="list-style-type: none"> • Microsoft Windows 7 • Microsoft Windows 8 • Microsoft Windows 2003 • Microsoft Windows Server 2008 • Microsoft Windows Server 2008 R2 • Microsoft Windows Server 2012
Architecture	<ul style="list-style-type: none"> • 64-bit only

AppAssure 5 Agent	
Operating systems	<p>Windows supported distributions:</p> <ul style="list-style-type: none"> • Microsoft Windows XP • Microsoft Windows Vista • Microsoft Windows 7 • Microsoft Windows 8 • Microsoft Windows Server 2003 • Microsoft Windows Server 2008 • Microsoft Windows Server 2008 R2 • Microsoft Windows Server 2012 <p>Linux Supported distributions:</p> <ul style="list-style-type: none"> • Red Hat Enterprise Linux (RHEL) 6.3 (32 and 64 bit) • CentOS 6.3 (32 and 64 bit) • Ubuntu 12.04 LTS (32 and 64 bit) • SuSE Linux Enterprise Server 11 SP2 (32 and 64 bit)
Virtualization platforms	<ul style="list-style-type: none"> • VMware ESX/ESX (i) • Microsoft Hyper-V • Citrix XenServer
Architecture	<ul style="list-style-type: none"> • 32-bit or 64-bit
Memory	<ul style="list-style-type: none"> • 4 GB or Higher
Microsoft Exchange support	<ul style="list-style-type: none"> • Microsoft Exchange 2007 SP1 Rollup 5 or later • Microsoft Exchange 2010 • Support for Database Availability Groups • Support for Single Copy Clusters • Support for Cluster Continuous Replication
SQL Server support	<ul style="list-style-type: none"> • MS SQL Server 2012, 2008 R2, 2008, 2005 • MS SQL clusters based on Microsoft Cluster Server
SharePoint Server support	<ul style="list-style-type: none"> • SharePoint 2010, 2007

* Availability and terms of Dell Services vary by region. For more information, visit www.dell.com/servicesdescriptions or contact your sales representative.

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