

Why YottaVault

Providing the Next Generation of Information Recovery Management

It's All About....RECOVERY!

High Availability

Redundant data vaults, communications equipment, internet circuits, power grids, processors and nodes eliminate single points of failure

Centralized Management Console

Manage all backups and restores from one central console

Global De-duplication at the Source, and Enterprise

At the source means up to 20x faster backups, and up to 400x reduction in daily backups within your Enterprise

Rapid Restores from Local Vault & Offsite Vault

One step restore of full backups, directories or files—no need to restore most recent complete backup, followed by incremental backup; absolute reliability at fastest speed possible; plus Bare Metal Restore of critical servers

Backup VMware

Agentless - Backup & Recovery of VMware ESXi and Eliminate requirements for custom VCB script development

Backup and Restore at the Mailbox/Message Level

Instant restores of individual email and entire mailboxes without having to restore the whole Information Store (MS Exchange, MS Outlook, MS SharePoint and SharePoint Server, GroupWise, Lotus Notes/Domino)

Continuous Data Protection - Real Time

Backup and Protect mission critical data as it is created; included as a standard feature with no additional charge or requirements

Agentless

No need to install and maintain software on every machine you want to backup; eliminate agent-based software compliance, pricing and performance issues

Autonomic Healing

Constantly scans all backup data for corrupted or otherwise problematic files and automatically corrects without human intervention



Raising the BARR - Backup, Archive, Rapid Recovery

Yotta280's *YottaVault* is a backup, archive and rapid recovery solution that includes, global data de-duplication to facilitate eliminating pointless transmission of redundant backup data that travels across the network and is stored. This counteracts the vast quantity of data growth in core data centers and at branch/remote offices. *YottaVault* shines in areas where conventional backup methods fail—remote office-branch office, VMware, and LAN file servers.

YottaVault eliminates habitual backup challenges by reducing the amount of backup data at the source. This feature stores a single copy at the delta block level for all locations, servers and storage.

The process of De-duplication also changes the financial model of disk versus tape. Therefore, companies can cost-effectively utilize *YottaVault*'s disk-based managed backup service at a cost that is comparable to or less than their current backup and recovery strategy; while gaining significant efficiency and value that previously was not possible.

The *YottaVault* software is agentless backup and has won first place in many mainstream storage industry product comparison challenges.

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What is Backup Data De-duplication?

Data de-duplication (also known as common file elimination, single instance storage, or redundant data elimination) is a technique for eliminating duplicate data at a file or delta block level. The primary approaches to data de-duplication can be commonly explained in expressions of where de-duplication occurs. There are three typical points of de-duplication:

- **Global and at the Source:** as a result of de-duplicating data globally and at the source, backup data is condensed at the client, before it is transported over the network and stored on high-speed spinning disk. This method minimizes the daily network bandwidth and storage space requirements, permitting trustworthy and efficient remote office backup via existing WAN bandwidth, VMware backup, and LAN-attached server backup. (*YottaVault*)
- **At the Target:** De-duplication occurs only after backup data reaches the de-duplication hardware device. The complete backup data set is sent to the device, including all redundant data. Data lessening occurs prior to being stored on disk or as a post-processing action. (Data Domain)
- **At the Network:** Usually leverages Wide Area File Services (WAFS) and WAN optimization technology. Given that it's not specifically intended for backup and recovery, this approach still depends on additional backup software. (Riverbed)



Reminder: *WAFS/WAAS is not data de-duplication or backup. These products may have elements of de-duplication or compression for efficiency, but their use scenario is different from YottaVault's. WAFS is designed to remove or reduce data at remote offices by having thin clients of applications at these sites with the primary data residing in the data center. Access to the data requires network access.*

Global De-duplication at the Source

Up to 400x reduction in daily backup data and up to 20x faster backups

YottaVault solves traditional backup challenges by de-duplicating backup data globally and at the source—prior to transferring the data over the LAN or WAN. Consequently, changed or copied files, shared applications, embedded attachments and even daily changing databases only produce a minimal amount of incremental backup data. Source based data de-duplication stops the inundation of data before it begins, providing amazingly proficient remote office and VMware backup.

YottaVault's global data de-duplication at the source provides several important customer benefits; a few of these are:

- Condenses daily network bandwidth requirements up to 400x
- Delivers up to 20x faster daily full backups
- De-duplicates data across sites, servers, and over time
- Perfect for remote/branch office deployment and VMware environments

YottaVault also offers flexible deployment choices. For remote offices, the YottaVault client software can be installed on one machine that has access to the other machines or storage to be protected. This allows data to be backed up directly over existing WAN connections to a central YottaVault server located at a maximum security data center.

Most importantly, with YottaVault's de-duplication it is irrelevant if the changes are at the beginning of the file, the end of the file, or in the middle. The YottaVault software will find and identify the changed data blocks and only backup the changes.

High Availability

Redundant data vaults, communication equipment, internet circuits, power grids, processors, nodes, and much, much more

When customary backup solutions fail, an enterprise is exposed to unacceptable windows of impending data loss. YottaVault provides several key high availability features to ensure data availability and integrity. In contrast, similar products from Symantec, Data Domain and others, do not offer true high availability and have single points of failure in their individual architectures.

YottaVault employs patented Redundant Node technology to provide failover across the nodes in a YottaVault N+1 Data Vault. YottaVault can continue to provide reliable data protection and the highest available access, even if a server node fails or becomes unavailable, since data is stored in Redundant Vaults and server nodes merely process the data. In the YottaVault system, N+1 software eliminates all single points of failure, ensuring that critical data can be quickly and reliably recovered when needed.



YottaVault's N+1 architecture provides failover and fault tolerance across nodes and vaults. Internal daily checkpoints verify the YottaVault's integrity while RAID protects data stored on disk.

YottaVault's Replicator feature is another way that companies can ensure the availability of their data. This feature replicates the data stored within a YottaVault system to another YottaVault system deployed in a geographically different location. In the event of a disaster scenario where a complete YottaVault system becomes unavailable, data can be recovered directly from the replication target.

YottaVault also protects itself with twice daily, internal checkpoints—CDP replication of the entire YottaVault system that can be verified for integrity. If an integrity check fails due to an inconsistency, and the inconsistency cannot be fixed, the system can be quickly rolled back to a prior checkpoint.

YottaVault eliminates the risk of "silent" data loss or corruption, which is common with tape archives. If integrity is compromised in a YottaVault system, YottaVault can recover the corrupted data using Autonomic Healing, internal checkpoints, or a replicated YottaVault system.

Centralized Management

Manage all backups and restores from one centrally located console

Although centralized management is common in a corporate datacenter, it is seldom common, or even an option when protecting multiple remote offices. YottaVault enables centralized backup management and monitoring via an intuitive web-based interface and a centralized console. This capability is a key differentiator for remote office data protection. It provides the ability to consistently and dependably control backup operations across many remote offices from one central location. Unlike other solutions that often require a separate management interface for each site, YottaVault enables administrators to easily schedule backup jobs, monitor, and modify policies for all locations from a single centralized console. Monitoring and report processing can also be done from a web-based interface.

As shown below, the YottaVault console provides an "at-a-glance" view of backup operations, which allows backup administrators to quickly assess the status of the YottaVault system and backup jobs from a central location.

The YottaUser is an intuitive graphical management interface that enables the following:

- Management of backup operations—including datasets, schedules and retention
- Administration of users and clients
- Centralized, wizard guided and on-demand backup and recovery
- Detailed reporting and monitoring
- Flexible retention policies can be easily altered when required.



Rapid Restores from disk either locally for current version or over the internet from the data center vault

One step restore of full backups, directories or individual files or emails—
NO need to restore last full backup, then incremental backups

Since it is a comprehensive disk-based backup and rapid recovery solution, YottaVault provides recovery capabilities that blows away traditional tape based solutions or traditional backup software plus device de-duplication products (e.g. Data Domain). YottaVault's data de-duplication technology enables companies to retain backup data on disk (in a YottaVault repository) for extended periods of time for the fastest recovery possible, when needed. YottaVault backups are essentially the same as a full backup; there is no need for administrators to restore the last good full backup and then restore each incremental to reach the desired recovery point objective. YottaVault backup data—whole backups, files, directories or individual emails—can be instantly recovered.

Traditional File Recovery Process:

1. Restore last full backup
2. Layer incremental backups
3. Find file
4. Restore file

How much time and work effort would this take in your environment?

Steps to recover an individual file


Traditional Way	The YottaVault Way
1. Find backup tapes and retrieve (may be offsite, which can take days or weeks to deliver)	1. Select file by point-n-click on the Onsite or Offsite YottaVault (stored to disk)
2. Restore file system from backup tape (Restore last full and layer all incrementals)	2. Restore file
3. Find file on file system	
4. Restore file	

Backup VMware

Fast Virtual Machine and VCB backups with minimal impact on hardware resources

Yotta280 provides an innovative way of backing up virtual servers without the need for agent software on each server. Entire sets of virtual machines (VMs) - individual ones, or files - can be restored quickly.





YottaVault software now supports VMware virtual servers. Its Client product runs in a commodity server at the target site and transfers backup data across a network, using compression and WAN acceleration techniques, to Yotta280's YottaVault repository in a Tier 4 Data Center. Only changes are sent, block level changes of the VMDK files rather than the entire virtual machine, after the initial full backup.

Yotta280's solution offers encryption, de-duplication and real-time continuous data protection with bare metal restore, virtual bare metal for virtual servers of course. Virtual machine restore can be to different hardware if the original or duplicate physical server is not available. The live VM backup allows administrators to back up VMs in the midst of production operations without disruption to production windows.

As of the creation of this whitepaper, disk-based backup products or services such as Symantec's PureDisk, Signiant's Mobilize for Remote Data Protection, Evault's InfoStage and EMC's Avamar Axion Replicator do not support VMware virtual server backup. Iron Mountain has a service, which supports VMware but it requires agent software in the target servers and doesn't have a bare metal restore capability.

In a physical server, backup software runs in the machine and backs up individual files, folders, or the entire disk to a locally connected tape system or disk-to-disk backup box. Typical backup service providers' backup data over a network to a remote vaulting site by using software agents in each target server.

Virtual servers can cause backup problems. Typically, backup software or agent software that runs in the server will backup the entire set of virtual machines but drains CPU resources to do so. Alternatively, software runs in each virtual machine (VM) to achieve backups; again using local server CPU resources as well as increasing software license costs.

According to IDC, by 2010, 1.7 million physical servers will be shipped to run virtual machines, a 300% increase over 2005. This substantial increase will increase demand for backup products to backup physical servers that may have up to 128 virtual machines running inside them; all with data protection needs.

The YottaVault software supports 64-bit technology and offers enormous performance boost over 32-bit software. A single Client machine can backup many virtual servers in parallel. Exchange 2007 backup and restore is also supported, which is a 64-bit product.

Yotta280 provides the most comprehensive backup offering for VMware.

Virtual server environments bring an added layer of complexity when it comes to backup. Yotta280's agentless backup solution is definitely well equipped for this space, bringing a feature set that is positioning Yotta280 as a standout in VM backup.



Implementing VMware virtual machines brings big benefits in terms of resource sharing and server consolidation, dramatically lower hardware costs and better hardware utilization. However, heavy server consolidation can also create challenges for traditional backup software due to the following:

- Each virtual server represents an individual backup job often with concurrent or overlapping backup windows
- VMs include redundant operating system, application and file data
- All redundant data gets backed up
- Heavy load on hardware resources (Disk, memory, NIC, CPU) hinders consolidation

YottaVault efficiently de-duplicates backup data within the virtual machines at the source. The amount of data backed up is greatly reduced, which lowers the impact on the underlying hardware resources, and in turn dramatically increases backup performance for virtual machine environments.

YottaVault can either be used to backup at the guest level—an individual virtual machine as described above—or at the VMware consolidated backup (VCB) server.

VMware Guest Backup

Traditional Backup	YottaVault Backup	Benefits of Yotta Vault Backup
<p><i>Virtual Machine Guest Backup</i></p> <ul style="list-style-type: none"> • Individual backup jobs for each VM guest • Weekly full and daily incremental backups • Move ~ 200% of primary data weekly • Very difficult to meet short backup windows 	<p><i>Virtual Machine Guest Backup</i></p> <ul style="list-style-type: none"> • YottaVault software de-duplicates data within each VM and across VMs • Daily full backups move 2-7% of primary data weekly 	<ul style="list-style-type: none"> • Up to 95 percent reduction in data moved • Up to 90 percent reduction in backup times • Less data, faster backups

YottaVault also supports VMware Consolidated Backup (VCB), an offering from VMware that allows SAN-attached VM servers to mount snapshots to an external server, offloading backups from the actual VM servers. YottaVault delivers great de-duplication benefits for VCB as well and minimizes CPU impact on that machine.

As shown below, YottaVault software handles each virtual machine guest to efficiently de-duplicate backup data at the source—before it is transferred across the underlying physical hardware resources.

Backup and Restore at the Mailbox & Message level

Fast restores of individual email and entire mailbox without having to restore the entire Information Store (MS Exchange, MS Outlook, MS SharePoint and SharePoint Server, GroupWise, Lotus Notes/Domino)

These functions are possible due to YottaVault's Message Level Restore and Recovery Tools services. The MLR service is for Message/Mailbox Level Restores and the Recovery Tools service is for MS SharePoint restores.



Real-Time Continuous Data Protection

Now you can have a current backup to within seconds; great for meeting the most sensitive Recovery Point Objective

Yotta280's YottaVault system is so advanced it can literally backup changes immediately as they happen. You can also backup at any interval you choose. Most other backup solutions rely on snapshots of file systems or databases whereas YottaVault gets down to the Delta block level backing up only the changes to the files; and when needed, only restoring the files and their changes that are requested.

Agentless

One software, one machine, no need to load and maintain software on every machine you want to backup, maintenance is done automatically, in the background.

No need to install and later upgrade software on every server, pc, or laptop that needs to be backed up. With YottaVault only one machine needs the software installed and from then on, the upgrades are done automatically in the background. You won't even realize its happening.

Autonomic Healing

Autonomic Healing serves as a network immune system, constantly scanning all backup data for corrupted or otherwise problematic files.

This includes files with data corruption or logical inconsistencies caused by third-party technologies (such as faulty RAID controllers, file systems, operating systems, disk subsystems, network packet loss, etc.). As Autonomic Healing checks backup files, it automatically corrects file and directory ID duplications, without the need of human intervention. When Autonomic Healing finds a problematic file that it can't fix at the offsite location, it automatically triggers the system's software at the primary site to re-synchronize and resend any corrupted files during the next scheduled backup. Autonomic Healing runs in the background, analyzing, repairing and replacing files as required - if there are any additional needs that it can't handle, the software quickly notifies the IT backup administrators to take manual action.





Archive Capabilities

	YottaVault	IBM	Hitachi	Symantec	CommVault
Email and File System Archiving	Yes	Yes	No	Yes , bundled at one price	Yes
Database Archiving	Yes	Yes	No	No	No
Hardware - CAS	Yes	No	Partner	No	No
Assessment Services	Yes	Yes	No	Yes	No

Backup Capabilities

	YottaVault	IBM	Hitachi	Symantec	CommVault
Data De-duplication	Yes	No	OEM	Yes	Yes
Bare Metal Recovery	Yes	Yes	OEM	Yes	Yes
NDMP to Disk	Yes	No	No	No	No
Assessment Services	Yes	Yes	No	Yes	No
Advanced Backup Analytics	Yes	No	No	No	No

Backup Infrastructure

	YottaVault	IBM	Hitachi	Symantec	CommVault
High-end Storage	Yes	Yes	Yes	No Storage Offerings	No Storage Offerings
Mid-range Storage	Yes	OEM	Yes		
SMB Storage	Yes	Yes	Yes		
NAS	Yes	OEM	Yes		
Virtual Tape (Open Systems)	No	Yes	Partner		
Virtual Tape (Mainframe)	No	Yes	Partner		

Did you know that Yotta280 can perform a Complete Data Audit that provides quantity, age, type, owner, last modification intelligence and much more; to help you manage your data and storage assets?

Fast Facts

- 60 % of all enterprise data resides at remote offices according to Gartner
- 20 % of respondents to a Storage Magazine survey have had tapes lost or stolen
- 69 % of respondents to a Gartner survey are unhappy with current remote office backup solutions
- 59% of all businesses do NOT transfer critical data to an off-site location
- Only 37% of all businesses test internal backups regularly
- Recovered data is typically days or weeks old
- When needed - 90% of TAPE backups FAIL according to IDC
- 60% of all businesses that lose data for 10 days or more GO OUT of Business within 6 mos.
- 43% NEVER reopen
- 29% that reopen, CLOSE within 2 years
- 93% that lose data for 10 plus days are BANKRUPT in 12 months; 50% file immediately

