EMC AVAMAR

Deduplication backup software and system

ESSENTIALS

- Data is deduplicated at the client, compressed and encrypted before transfer across the network
- Reduces network bandwidth for backup by up to 99 percent
- Global deduplication reduces total backup storage up to 95 percent
- Reduces backup times up to 90 percent
- Always a daily full backup in a fraction of the time
- Single-step recovery
- Optimized protection for virtual environments, NAS systems, desktops/laptops, remote offices, and business-critical applications
- Secure backup and replication for disaster recovery via existing LAN/WAN links
- Redundant Array of Independent Nodes (RAIN) for high availability and reliability
- Daily server and data recoverability checks
- Export backup data to tape or VTL for long-term retention
- Flexible server deployment options: Avamar Data Store, Avamar Virtual Edition, Avamar Business Edition
- Complete integration with Data Domain Systems for optimal protection storage

Companies are redefining their backup and recovery as a result of exponential data growth, regulatory compliance, increased service-level agreements, and shrinking backup windows. The IT team faces additional challenges brought on by accelerated virtualization, converged infrastructure and the need to improve data protection across the enterprise, including remote offices.

Developed to solve the challenges associated with traditional backup, EMC® Avamar® deduplication backup software and system provides fast, daily full backups for virtualized environments, NAS systems, desktops/laptops, remote offices, and business-critical applications.

Unlike traditional backup solutions, Avamar eliminates redundant sub-file data segments at the client before backup data is transferred across the network and stored to the EMC Avamar Data Store or EMC Data Domain Systems. As a result, the network bandwidth required for backup is reduced by up to 99 percent—delivering fast daily full backups across existing IP WAN/LAN links and virtual infrastructure. Avamar also deduplicates backup data globally, across sites and servers, reducing the required total backup disk storage by up to 95 percent. Avamar also provides efficient, daily asynchronous replication to meet disaster recovery objectives. Backup data can be encrypted in-flight and at rest, enabling secure, cost-effective, retention on disk.

DRAWBACKS OF CONVENTIONAL BACKUP AND RECOVERY

One of the key drivers impacting backup performance is the amount of data that must be protected within the available backup window. Traditional solutions are inefficient because they repeatedly backup everything—duplicate files and sub-file data segments that exist across servers, desktops, laptops, and offices. When combined with traditional daily incremental and weekly full backups, the quantity of duplicate data is staggering. The sheer amount of data that must cross already congested networks, backup servers, and infrastructure often makes meeting backup windows a challenge.

The impact is especially severe when dealing with virtual environments, remote offices, and NAS systems. In virtual environments, each virtual machine (VM) represents an individual backup job, often with overlapping backup windows, and includes redundant operating system, application, and file data. Consequently, backups for VMs often overrun backup windows and tax shared resources, leaving data unprotected and creating issues for backup administrators.

In remote offices, limited network bandwidth makes centralized, automated WAN-based backup nearly impossible. As a result, remote non-IT staff must handle backup tasks. Failure-prone, tape-based hardware and ad-hoc manual processes do not provide reliable remote office data protection.

EMC²

"With Avamar, we get daily full backups in less than an hour across our existing network links with 99.7% data reduction. We restored an entire database in one and a half hours versus the many hours it would have taken with tape in the old environment."

BILL MEEK

SENIOR VICE PRESIDENT AND INFORMATION SYSTEMS MANAGER
BROADWAY BANK

EMC AVAMAR DATA STORE RAIN GRID

Protecting scale-out NAS systems poses a significant challenge, especially when full backups fail to complete within the allotted time frame, which can impact employee productivity and leave data unprotected. In many cases, NAS usage and consolidation is limited by the required backup window, not system capacity or performance.

Traditional solutions also increase costs because extra storage is needed to retain duplicate backup data. This is often exacerbated by extended data retention requirements for regulatory compliance. In addition, traditional backup often involves the shipment of tapes offsite, which can result in exposure of confidential information, theft, or data loss.

NEVER BACK UP THE SAME DATA TWICE

Avamar provides fast, efficient backup and recovery by reducing the size of backup data at the client—before it is transferred across the network and stored. Avamar also deduplicates backup data globally across your servers, desktops, laptops, and offices worldwide to reduce the total required backup storage by up to 95 percent. As a result, Avamar provides benefits of efficient long-term retention of backup data on disk while dramatically lowering capital and operating expenses including floor space, power and cooling.

Avamar backups can be quickly recovered in just one step—eliminating the hassle of restoring full and subsequent incremental backups to reach the desired recovery point. The backup data is FIPS140-2 encrypted while in transit and at rest for added security.

In addition, Avamar has integrated RSA Data Protection Manager for generation of encryption keys for encryption-at-rest. In turn this provides a secure key vault, high availability and simplified audits for security compliance.

HIGHLY EFFICIENT DATA DEDUPLICATION

The method for determining segment size is a key factor in eliminating redundant data at a sub-file level. Some solutions on the market use fixed-length segments when performing deduplication. With this approach, even small changes to a dataset (for example, inserting data into the beginning of a file) can change all subsequent fixed-length segments in a dataset. Despite the fact that very little of the data has actually changed, the entire file will appear as new data that must be backed-up again.

Avamar solves this problem by examining the data to determine logical boundary points using variable-length data segments. Avamar delivers the most-efficient global, client-side data deduplication on the market—dramatically reducing the amount of data sent and stored, while eliminating backup bottlenecks and reducing backup times.

SCALABILITY, HIGH AVAILABILITY, AND RELIABILITY

Unlike many server deployments, the Avamar Data Store uses a grid architecture that facilitates linear performance increases by simply adding storage nodes. Each incremental node increases CPU, memory, I/O, and disk capacity for the entire grid. When a storage node is added, data is automatically load-balanced without compromising system performance.

When traditional backup solutions fail, a company is exposed to potential data loss. Avamar eliminates single points of failure by employing patented redundant array of independent nodes (RAIN) technology to provide high availability across nodes in the Data Store. In addition, system and data integrity is verified daily to ensure recoverability.

"Avamar is important to our IT transformation at Virtua, It's enabling us to manage our growth, reduce our downtime, and dedicate resources to new, innovative projects. We can bring new and strategic initiatives to market efficiently, and these projects are providing more value to our customers."

CHAS THAWLEY ASSISTANT VICE PRESIDENT VIRTUA

OPTIMIZED PROTECTION FOR VIRTUAL INFRASTRUCTURE

Avamar deduplicates your backup data globally, across your physical and virtual servers. For virtualized environments, flexible backup options include guest- and image-level backups that leverage the latest VMware® vSphere and Microsoft® Hyper-V APIs. In all cases, only new, unique sub-file, variable-length data segments are transferred across the virtual/physical infrastructure. Avamar leverages VMware's Changed Block Tracking (CBT) for both faster backups and restores. For image backup, only Avamar maximizes throughput by using intelligent load balancing across multiple proxy VMs. Avamar provides fast, single-step recovery of individual files or complete VM images to the original VM, an existing VM or a new VM. For VM images stored on a Data Domain Systems, a VM can be instantly accessed, and while running be vMotioned back to the production environment. Avamar is integrated into the VCE Vblock® Systems, and certified for VSPEX® Proven Infrastructure data protection. Avamar is integrated into VMware's vSphere Web Client so VM adminstrators can run backups and recoveries without ever leaving vSphere. For Service Provciders and large enterprises using ~~vCloud Director,~~ Avamar has embedded its comprehensive backup and recovery capabilities right into ~~vCloud Director,~~ along with extensible APIs that enable a true multi-tenant environment that spans protection storage.

HIGHLY EFFICIENT NAS NDMP BACKUP

Avamar provides fast, reliable NAS system backup and recovery via the Avamar NDMP Accelerator node. With this approach, a level-0 backup is performed only once, during the initial full backup. Subsequent daily full backups are achieved by requesting only level-1 incremental dumps, and building them into a daily full backup view. This dramatically reduces backup times and the impact on NAS resources, and allows an easier and faster recovery. Avamar eliminates backup bottlenecks and provides the freedom to consolidate storage and optimize NAS systems—without limiting the number and size of files or volumes—to meet the backup window. Now with automated multi-streaming, Avamar can handle large scale-out NAS systems by delivering increased throughput to protection storage.

"We would not be able to reach our virtualization goals at Sub-Zero Wolf, without the state-of-the-art backup and recovery that Avamar provides."

CRAIG WUERZBERGER
SYSTEMS ENGINEER
SUB-ZERO WOLF, INC.

FAST DESKTOP/LAPTOP BACKUP

Avamar also delivers efficient desktop/laptop backup and recovery. It provides data deduplication, open-file backup, and CPU throttling. Avamar leverages existing network links, and since it operates in the background, it is not disruptive to end-users. Data is automatically backed up when a user logs in during normal backup windows. End-users can also initiate their own backups on demand. Avamar enables self-service recovery to end-users, so they can quickly recover their own data anywhere, anytime, via an intuitive interface and integrated search engine. And recovery is always just one step. As a result, end-users can easily recover their own data without lengthy calls to the IT help desk. This also frees the IT team to work on other projects.

EXTENDED RETENTION

Avamar helps companies meet compliance regulations that require extended retention of data by sending backup data to a media access node, which then places the data on a VTL or tape. Data is stored in the original format maintaining all permissions and attributes, which supports offsite restores for eDiscovery.

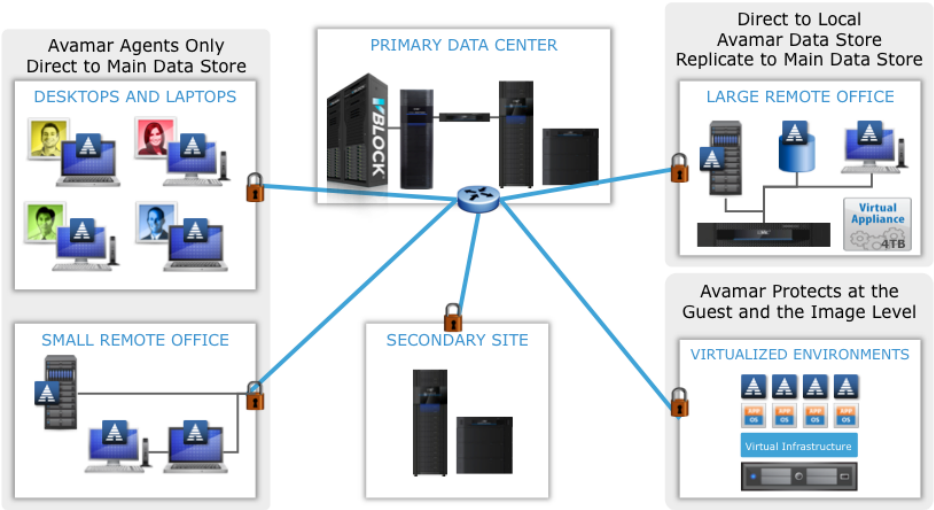
BACKUP RECOVERY MANAGER

The Backup Recovery Manager provides control and monitoring for Avamar, NetWorker and Data Domain systems from your tablet. It requires no license and can be installed by any customer leveraging the Data Protection Suite. Android and iOS operating systems are supported.

FLEXIBLE DEPLOYMENT OPTIONS

Avamar provides flexibility in solution deployments depending upon your specific use case and recovery requirements. Avamar Data Store is a turnkey backup and recovery solution that integrates Avamar software with EMC-certified hardware for streamlined deployment and service. A replicated Avamar Data Store single-node is ideal for smaller businesses or remote offices with strict SLAs.

The EMC Avamar Virtual Edition—the industry's first deduplication virtual appliance for backup and recovery—consists of EMC Avamar software deployed as a virtual appliance. It enables the deployment of a complete Avamar server on an existing VMware ESX server or Microsoft Hyper-V server, leveraging the attached disk storage (up to 4TB) and infrastructure. Since all aspects of the backup and recovery process are encapsulated and virtualized, control and management are also streamlined, reducing demands on your IT staff. Avamar Virtual Edition has the added benefit of cost-effective Avamar virtual-to-virtual, or Avamar virtual-to-physical server replication to meet your disaster recovery objectives.



For remote offices, lightweight, efficient Avamar software agents can be deployed on servers with no additional remote hardware required. This enables data to be backed up directly via existing WAN links to a central Avamar Data Store at the data center, eliminating the need for local tape backups and offsite tape shipments risks.

For mid-market environments, the EMC Avamar Business Edition provides a competitively priced, conveniently sized, turnkey deduplicated backup solution. This fully featured single-node solution eliminates the need to replicate data to another Avamar single-node.

For application-specific backup, Avamar uses a multi-streaming approach with EMC Data Domain® Boost software to send business-critical application data directly to Data Domain Systems. File systems and NDMP acceleration for NAS backup can also be directed to Data Domain Systems for backup storage. Now customers can unify their data protection process with the leading deduplication software and purpose-built backup appliances in the industry; achieving the highest performance and most scalable backup and recovery solution.

In addition, Avamar's centralized web-based management and at-a-glance dashboard view make it easy for you to protect hundreds of offices worldwide from a single location over existing network bandwidth.

"By integrating Avamar with Data Domain, we're able to take advantage of the systems' scale and high throughput for backing up our very large databases. And the more we work with both products, the more functionality we uncover. We finally have a true enterprise strategy for backup and recovery, grounded by leading-edge techology."

RYAN FERNANDES
CHIEF INFORMATION OFFICER
FULTON COUNTY, GA, USA

"The [EMC] Avamar remote office solution enabled us to reduce administrative support requirements by 80 percent, reduce backup windows by 90 percent, and recover lost files and servers in minutes rather than hours."

MIKE DEPHILLIP
BACKUP ADMINISTRATOR
VIRGINIA DMV

Avamar Feature	Avamar Benefit
Global, client-side variable length deduplication	Backup data reduced at the client and globally; reduces network bandwidth for backup by up to 99%; reduces cumulative backup storage by up to 95%; reduces daily full backup times by up to 90%.
Secure, efficient use of existing LAN/WAN links	Data is compressed and encrypted in-flight. Encryption at-rest is optional. Eliminates reliance and risk for off-site tape for DR.
High availability and data recoverability	Redundant Array of Independent Nodes (RAIN) grid architecture for high availability across nodes.
Server health and data recoverability	Avamar server integrity and backup data recoverability verified daily.
Centralized management	Simplifies remote office backup by leveraging data center expertise; Single pane of glass to manage the enterprise.
Fast, single-step recovery	Recovers data (full or file-level) immediately; No need to stage full backup and daily incrementals.
Export backup data to tape or VTL for extended retention	Meet regulatory compliance.
VMware vSphere and Microsoft Hyper-V backup and recovery	Fast, efficient daily full backups for virtual machines; supports comprehensive Guest- and Image-level backup and recovery.
Simplify VMware backup and recovery operations	Automated Proxy Management with recommendations, and zero-touch VMDK snapshot management & cleanup
Comprehensive integration to VMware vCloud Suite and vRealize	Enables cloud-ready, multi-tenant Data Protection as a Service with extensible API for Service Providers
Physical and virtual Avamar system deployment options	Best-in-class solutions to meet specific needs; easy to use interface for all environments.
Multi-streaming integration with Data Domain Systems	High-performance application-specific backup and recovery for industry leading business critical applications, file systems and NDMP data streams.
Integrated into VCE Vblock Systems and certified with VSPEX Proven Infrastructure	Optimized data protection for converged infrastructure platforms.
Included in the EMC Data Protection Suite	Harness the power of the industry's leading backup and recovery software products in a flexible licensing suite.
Backup Recovery Manager on mobile devices (iOS, Android)	Easier than ever to manage Avamar environments from a single pane of glass in the palm of your hand.

HARDWARE OPTIONS

- Avamar Data Store purpose-built backup appliance
- Avamar NDMP Accelerator Node for NAS system backup
- Media Access Node for extended retention
- EMC Data Domain Deduplication Storage Systems

EMC Avamar Deduplication Software only stores data to Avamar Data Stores, Avamar Virtual Edition or Data Domain Systems.

CLIENT ENVIRONMENTS SUPPORTED

OPERATING SYSTEMS

- Apple Macintosh OS X
- CentOS
- Debian
- Free BSD
- HP-UX
- IBM AIX
- Iomega
- Linux
- Microsoft Windows
- Red Hat Linux (RHEL)
- Novell NetWare
- Oracle Linux
- SCO UNIX
- Sun Solaris
- SUSE Linux
- Ubuntu

APPLICATIONS

- IBM DB2
- IBM Lotus Domino
- Microsoft Exchange
- Microsoft SharePoint
- Microsoft SQL Server
- Microsoft Hyper-V
- NDMP for NAS Filers
- Oracle, Oracle RAC
- SAP
- Sybase
- VMware vSphere

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