

EMC AutoStart Modules for Applications and Data Sources

Integrated application and data source modules for ease of use

The Big Picture

- Reduces the cost and impact on your business caused by unplanned or planned downtime
- Improves the effectiveness of your business continuity plans by managing and automating the activities required to restart and relocate application and data services
- Replaces error-prone manual activities required for IP management during a wide area failover
- Provides full failback service to quickly restart the business after the primary site recovers
- Notifies designated personnel of any failure or indication of impending failure
- Integrates with EMC replication technologies for full application and data continuity management
- Includes a single management console for heterogeneous domains
- Supports Windows, Solaris, HP-UX, AIX, Red Hat Linux, SUSE Linux, and VMware ESX Server Windows guest operating systems

In the event of an application resource failure, site disaster, or planned service disruption, EMC® AutoStart™ automates the restart process of your application and data sources on an alternate local or remote server. AutoStart also automates the failback of your services, applications, and data—managing failover in both directions ensuring consistent and error-free business continuity. As a critical component of EMC’s replication and business continuity strategy, AutoStart takes advantage of EMC’s best-of-breed replication technology, enabling customers to eliminate lengthy or unexpected outages and downtime.

AutoStart provides add-on application modules for Microsoft SQL Server 2005 and Exchange 2003, 2007 as well as Oracle 10g and 11g on Windows, Linux, Solaris, AIX, and HP-UX. AutoStart includes a data source module for EMC RepliStor® for Windows as part of the base product and offers additional add-on data source modules for EMC SRDF®/Asynchronous, SRDF/Synchronous, MirrorView™/Synchronous, and MirrorView/Asynchronous. The add-on AutoStart application modules and data source modules require the base AutoStart product.

The AutoStart programming interface can be used to create custom solutions to manage and monitor your custom applications in addition to the out-of-the-box solutions for Exchange, SQL, and Oracle.

EMC AutoStart application modules

Microsoft Exchange application module

This add-on module makes it easy to configure high availability for a Microsoft Exchange environment. The AutoStart module for Exchange provides a virtual node solution for clustering Microsoft Exchange 2003, 2007. The currently active Exchange mail server appears on the network as a virtual host name used in mailbox administration. This allows Exchange services to failover Exchange without readdressing the mailboxes. This feature creates much faster failover times and eliminates error-prone Active Directory searches and updates. The AutoStart module for Exchange provides start, stop, and monitoring capabilities for disaster restart as well as maintenance operations.

The AutoStart module for Exchange allows multiple node configurations. The qualified data sources for this solution are:

- Composite data source (combined RepliStor and AutoStart Mirroring)
- RepliStor data source
- AutoStart mirroring
- SRDF/Synchronous and SRDF/Asynchronous
- MirrorView/Synchronous and MirrorView/Asynchronous
- Shared-disk device without replication

SQL Server application module

The AutoStart SQL Server application module provides start, stop, SQL Server 2005 and 2008 monitoring, and availability tracking. The module continually monitors both SQL Server and the node it runs on, and either restarts or moves SQL Server in the event of failure to another node. Two types of failover can be configured: active/passive and active/active.

Addressing planned downtime today (48 hours of downtime)



1. **Friday:** Employees notified that e-mail will be down Saturday and Sunday.



2. **Saturday:** Administrator manually shuts down e-mail.



3. **Saturday:** System maintenance, application upgrades.



4. **Sunday:** Administrator brings systems online manually, hopes everything goes smoothly.

The AutoStart application module for SQL Server allows multiple node configurations and is qualified with the following data sources:

- Composite data source
- RepliStor data source
- MirrorView/Synchronous and MirrorView/Asynchronous
- AutoStart mirroring
- SRDF/Synchronous and SRDF/Asynchronous
- Shared-disk device without replication

Application modules for Oracle on Windows, Linux, Solaris, HP-UX, AIX

The AutoStart application module for Oracle starts, stops, and monitors Oracle 10g and 11g databases for Windows (including VMware® guest OS), Linux, Solaris, HP-UX, and AIX, and provides availability tracking for the database. The module continually monitors both the database and the node on which it runs, and either restarts or moves the database in the event of failure. Either a shared disk or a mirrored disk provides access to the database in a two-node domain. This module only supports active/passive configurations, which means that the database can run on only one node at a time.

The AutoStart application module for Oracle allows multiple node configurations and is qualified with the following data sources:

- Composite data source for Windows only
- AutoStart mirroring for Windows only
- Shared-disk device for Windows only
- RepliStor data source for Windows only
- MirrorView/Synchronous and MirrorView/Asynchronous for Windows, Linux, AIX, and Solaris
- SRDF/Synchronous and SRDF/Asynchronous for Windows, Linux, HP-UX, AIX, and Solaris

EMC AutoStart data sources

In many distributed configurations, data storage is on a device separate from the node. Without a means of controlling access to the data in the event of failure, a node could be cut off from the data. Data sources allow any AutoStart node to access data from a common storage device.

The data source defines a disk object, which can then be managed. The name of the data source definition allows AutoStart to reference the data source using a common name throughout the AutoStart domain. Using the data source definition name, AutoStart can attach and detach the disk resource, as well as monitor its state. AutoStart manages the attach and detach operations, but once the data source is attached to a node, AutoStart does not control disk operations nor provide any access restrictions. Permissions and restrictions are controlled by the operating system. Attach and detach operations are done through standard operating system commands (UNIX) and APIs (Windows). AutoStart does not in any way insert itself into the data path of the managed application. Once the data source is attached to a node in the AutoStart domain, that node can then read and write data to the storage device.

There are several data sources available for AutoStart as part of the base product, each one tested with all the applicable application modules:

- **AutoStart mirroring**—Provides built-in, block-level mirroring between two Windows servers.
- **Shared-disk device for Windows**—AutoStart manages attaching to a shared disk from two or more nodes in the AutoStart domain on Windows systems.
- **Oracle ASM for Linux**—AutoStart manages attaching to a shared disk from two or more nodes in the AutoStart domain on Linux systems using Oracle Automatic Storage Management (ASM).
- **Composite data source**—AutoStart manages attaching of a grouping of two or more individual data sources into a single data source for Windows.
- **Windows network share**—AutoStart manages attaching from nodes within the AutoStart domain to a Windows share. The Windows share may be on a machine outside the AutoStart domain.
- **VERITAS Volume Manager (VxVM) for Windows**—AutoStart manages attaches using VERITAS Volume Manager for Windows in physical and VMware ESX Server™ Windows guest operating system environments.
- **AIX Volume Group**—Managed using AIX Logical Volume Manager.
- **HP-UX LVM (Logical Volume Manager)**—Managed using HP Logical Volume Manager for HP-UX.
- **VERITAS Volume Manager for Solaris**—AutoStart manages attaches using VERITAS Volume Manager for Solaris.
- **Linux Volume Manager**—AutoStart manages access to volumes controlled by the native Linux Volume Manager.

Addressing planned downtime with EMC AutoStart (only minutes of downtime)



1. **Friday:** Failover of data to secondary server, transparent to users.



2. **Saturday:** System maintenance, application upgrades. Systems are back to normal.



3. **Sunday:** Data migrated back to primary server.



4. **Monday:** Systems back online with no interruption to users.

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AutoStart manages files system data sources on several platforms, including:

- Solaris File Systems (UFS, VxFS)
- HP-UX File Systems (HFS, VxFS)
- AIX File Systems (JFS, JFS2)
- Linux File Systems (ext2, ext3, reiserfs) file system
- VMware File System (VMFS)
- Windows File Systems (NTFS FAT, FAT-32)

EMC RepliStor data source

The data source for RepliStor provides improved integration with AutoStart by allowing the user to create, enable, disable, and delete RepliStor specifications from within the AutoStart console. Additionally, a user can include a data source for RepliStor in a composite data source. The RepliStor data source is for Windows only environments and is included in the base AutoStart product for Windows. Replistor needs to be purchased separately.

MirrorView/S/A data source

The EMC MirrorView data source (a collection of disk resources that the application resides on) is an add-on option to the base AutoStart product. It provides application availability to critical data, even in the event of node, network, or resource failure. A typical configuration is an AutoStart domain of two or more nodes connected to a pair of EMC CLARiiON[®] arrays.

The MirrorView data source supports AutoStart application modules, such as Exchange, Oracle, and SQL Server. These critical applications depend on underlying resources for running and for online availability. Included resources are databases, resource groups (a collection of objects, such as services, processes, IP addresses, data sources, and others that comprise a failover group), volumes, and data sources. AutoStart brings these resources online in a controlled order when failover occurs.

SRDF data source

The EMC SRDF data source (a collection of disk resources that the application resides on) is an add-on option to the base AutoStart product. It provides application availability to critical data, even in the event of node, network, or resource failure. A typical configuration is an AutoStart domain of two or more nodes connected to a pair of EMC Symmetrix[®] data arrays.

The SRDF data source supports AutoStart application modules, such as Exchange, Oracle, and SQL Server. These critical applications depend on underlying resources for running and for online availability. Included resources are databases, resource groups (a collection of objects, such as services, processes, IP addresses, data sources, and others, that comprise a failover group), volumes, and data sources. Resources such as SRDF data source, volumes, services, processes, IP addresses, and others constitute these applications and AutoStart groups them into a failover group to manage and move them together. AutoStart brings these resources online in a controlled order when failover occurs.

AutoStart resource groups startup and shutdown sequences allow dependency to be built between SRDF devices, volume manager volumes, and file systems so they can be brought online and offline in the correct sequence. The SRDF data source also monitors SRDF links and device states to ensure remote replication availability. SRDF provides a vital link that lets you manage failover and failback control operations at the host level. SRDF manages one or more devices as a device group or composite group. The device groups are configured into two sides—the R1 (primary) side and the R2 (secondary) side.

When a host is connected to the primary site Symmetrix, it writes to R1 devices. The R1 has a remote mirror, designated R2, which is located at the secondary site. In the event that the primary Symmetrix becomes inaccessible, AutoStart initiates a failover and restarts the application off of R2, the secondary connection.

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