
Redefining Microsoft® Exchange Management

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Redefining Microsoft® Exchange Management

June 2015

Purpose

The purpose of this paper is to provide a high-level overview of basic Actifio concepts and the procedures used to capture, manage, and access Microsoft® Exchange.

Actifio Data Virtualization

Actifio Enterprise™ is the highly scalable copy data management platform that virtualizes application data to improve the resiliency, agility, and cloud mobility of your business.

It works by virtualizing data in much the same way other technologies have virtualized servers and networks.

Actifio Enterprise enables users to capture data from production systems, manage it in the most efficient way possible, and use virtual or physical copies of the data whenever and wherever they are needed.

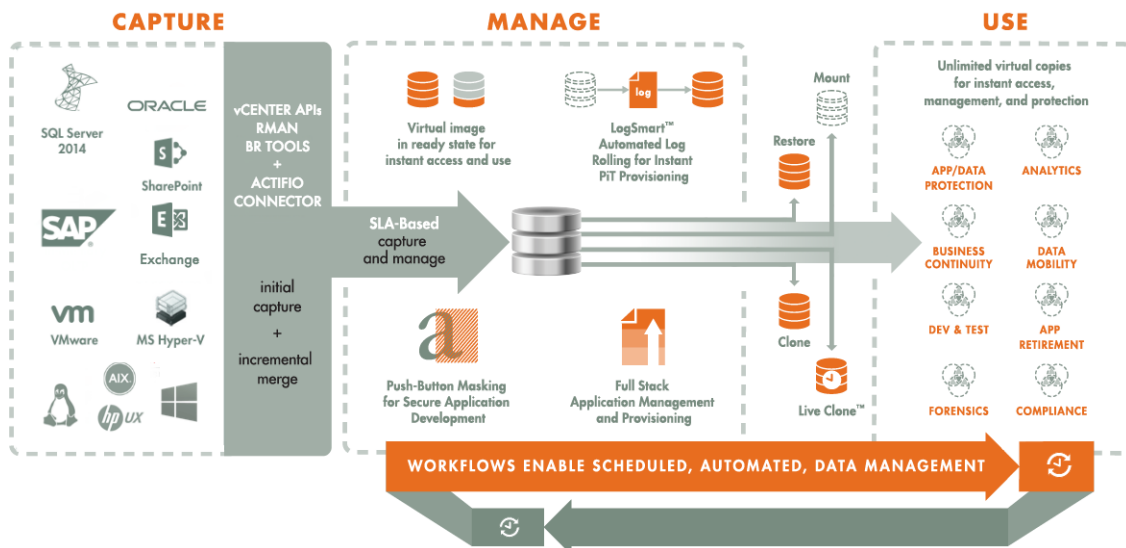


Figure 1 Capture, Manage and Use Application Data

Application data is captured at the block level, in native format, according to a specified SLA. A Golden copy of that data is created, moved, and stored once and is then updated incrementally with only the changed blocks of data in an "incremental forever" model. Unlimited virtual copies of the data can then be accessed instantly for use, without proliferating physical copies and taking up additional storage infrastructure.

Capturing Data

Actifio appliances manage Microsoft® Exchange by snapshotting individual databases.

For Exchange Database Availability Groups (DAG) an Actifio appliance will, by default, capture data from one of the passive nodes. Capturing the passive node minimizes impact on your production environment. If the passive node should fail, the Actifio appliance can select another node based on an user defined prioritized list of nodes.

When capturing and moving Microsoft® Exchange Databases, production data is typically controlled by a non-Actifio storage controller on your existing storage arrays. The Actifio appliance moves and manages the Microsoft® Exchange data separately from where Microsoft® Exchange writes its primary storage. This approach is known as Out-of-Band.

As shown in Figure 2, an Actifio appliance manages copy data by presenting a staging disk. That staging disk maintains a golden copy of the application's historical data that is managed using Actifio snapshots.

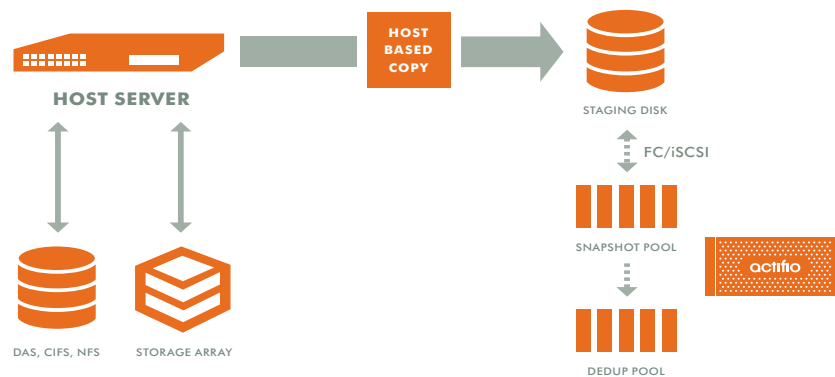


Figure 2 Actifio Data Capture

When capturing data:

- A staging disk is automatically created and mounted on a server via Fibre Channel or iSCSI.
- An initial full copy is made to the staging disk. Subsequent copies consist only of incremental change blocks.
- The staging disk is unmounted from the server.
- A snapshot of the staging disk is made on the Actifio appliance.

Actifio offers an alternate data capture configuration where production data storage is controlled by an Actifio appliance. With this approach snapshots and changed-block tracking are native to the Actifio appliance and the Actifio appliance is placed in the data path between the SAN and the application host. This approach to data control is known as "In-Band."

The Actifio Connector

An Actifio appliance captures data by making an initial full copy of the data, then making copies of incremental changes. This capability requires the ability to track and capture the changes that occur between capture operations. To track those changes the Actifio appliance uses the Actifio Connector.

The Actifio Connector is a small-footprint, lightweight service that can be installed on either virtual or physical servers. The Actifio Connector takes advantage of Microsoft® Exchange VSS Writer for discovery, capture, and access operations. Microsoft® Exchange VSS Writer is installed by default on most Microsoft® Exchange Databases.

The Actifio Connector allows you to discover and capture a individual Microsoft® Exchange Databases as well as the members of a Microsoft® Exchange Database Availability Group (DAG).

Specifically, for both physical and virtual servers, the Actifio Connector:

- Discovers applications
- Quiesces applications
- Identifies changes to application data for Actifio's incremental forever capture strategy
- Can manage members of a Microsoft® Exchange DAG with a single SLA
- Can manage Actifio Consistency groups of Microsoft® Exchange databases.

As the name implies, consistency groups ensure consistent point-in-time capture and recovery across multiple applications on the same host. To achieve application consistency, members of a consistency group are quiesced and captured together via a single policy. To conserve VDisk consumption, consider placing stand alone Microsoft Exchange Databases into a consistency group.

Because Microsoft® Exchange DAG members can be spread across multiple hosts, they are not eligible for consistency group membership.

- Captures and manages transaction logs:
 - o Manages Microsoft® Exchange Database logs with one SLA
 - o Truncates Microsoft® Exchange Database transaction logs

Microsoft® does not support snapshots of VMs that host Microsoft® Exchange Databases or the restoration of an Exchange VM over an existing Exchange VM. To manage a Microsoft® Exchange Database on a VM, install the Actifio Connector on the VM and manage the Microsoft® Exchange Database as an application.

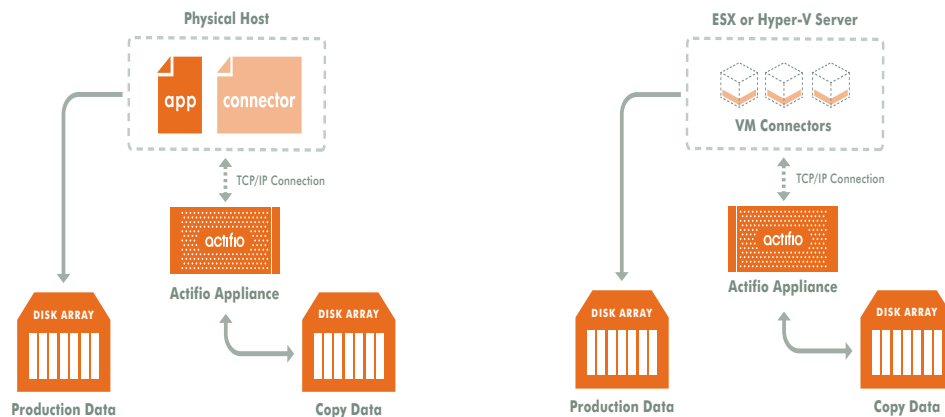


Figure 3 Managing Microsoft® Exchange Databases on Physical and Virtual Servers

Note: An Actifio Sky appliance is a VMware VM and can be on the same ESX server as the VMs it manages.

Managing Microsoft® Exchange Database Data

An Actifio appliance can manage:

- Individual or consistency groups of Microsoft® Exchange Databases on physical or virtual servers
- The passive or active nodes in Microsoft® Exchange Database Availability Groups (DAG)
- Public folders

Managing Microsoft® Exchange Database copy data consists of five steps:

1. Discover all physical servers that host Microsoft® Exchange Databases via the Domain Manager Service.

When discovering the physical and virtual servers that host the Microsoft Exchange Databases in a DAG, discover all of the hosts first, then discover all of the Microsoft Exchange Databases. Doing so will ensure that all members of the DAG will be present and accounted for when you apply the policies and resource profiles.

Note: *Although all databases in a Microsoft® Exchange Database Availability Group (DAG) can be discovered from a single DAG node, it is best to discover all hosts individually.*

2. Discover all VMs that host Microsoft® Exchange Databases via the Application Manager Service.
3. Discover all Microsoft® Exchange Databases via the Application Manager Service.
4. Define Actifio Policy Templates and Resource Profiles according to your RPOs and RTOs via the SLA Architect.
5. Assign Actifio Policy Templates and Resource Profiles to Microsoft® Exchange Databases via the Application Manager.

From the Application Manager's Advanced Settings you can also specify the IP address of DAG members. The list determines DAG members and the order in which a member will be selected should the active node fail.

Replicating Data

Data replication has traditionally been an inhibitor to efficient data management in a geographically distributed environment. Actifio replication for Microsoft Exchange addresses these issues with a global deduplication and compression approach that provides two types of replication:

Dedup Async Replication

Dedup Backup to Dedup DR Replication

Dedup Async Replication

Dedup Async replication is policy driven and moves globally deduplicated and compressed production data over the network to a second Actifio appliance. Initially a full copy of production data is captured and replicated to a second Actifio appliance. Going forward, only changes to the production data are captured and replicated to the second Actifio appliance. Changes are merged with the copy on the second Actifio appliance to create an up-to-date, ready to use mirror copy of your data.

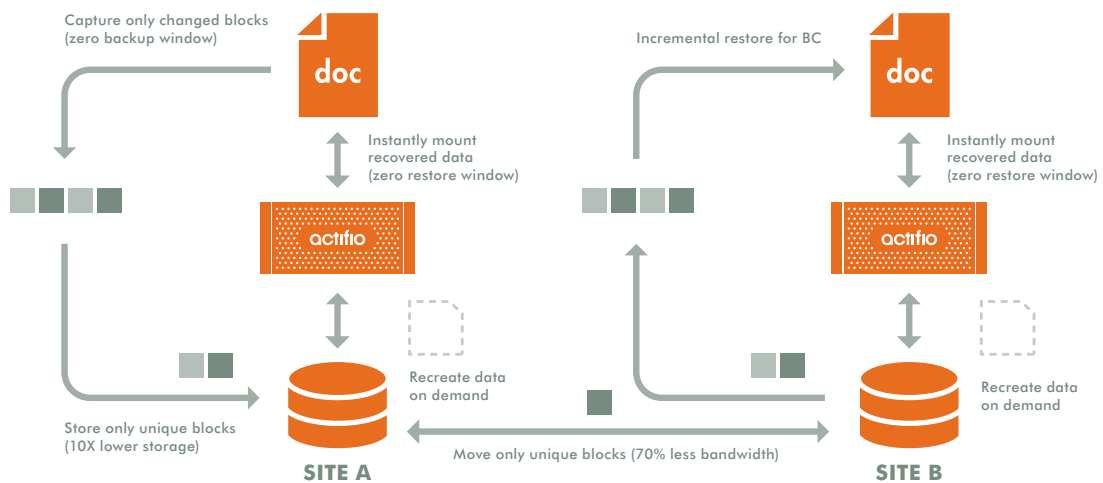


Figure 4 Dedup Async Flow

Because only change blocks are replicated, Dedup Async uses a fraction of the bandwidth required with traditional replication technologies. It also provides an application consistent copy of ready to use data on a second Actifio appliance.

Dedup Backup to Dedup DR Replication

Dedup Backup to Dedup DR replication is policy driven and provides a means for secure and efficient long-term storage of deduplicated backup data. Actifio's proprietary deduplication-aware replication protocol transmits only deduplicated, unique blocks to another Actifio appliance. This approach minimizes the bandwidth required to move data between Actifio appliances.

Dedup Backup to Dedup DR replication also provides the added benefit of allowing data to be replicated to a second Actifio appliance, then from the second Actifio appliance, the same data can be replicated to a third Actifio appliance.

Accessing Data

Actifio managed data can be accessed from an Actifio appliance via a Fibre Channel or iSCSI interface, just like accessing a traditional storage system.

Managed data can be accessed in the following ways:

Mounts

The Actifio mount function provides instant access to data without moving data. For consistency groups, all applications in the group are mounted and instantly accessible.

To recover a Microsoft® Exchange Database, individual mailboxes or individual messages, you can mount a copy of the Microsoft® Exchange Database to a host. From there you can use Kroll OnTrack® Data Recovery to recover (drag and drop) Microsoft® Exchange Database items where needed. In addition, you can use a Microsoft® Exchange recovery database to restore items, or copy the database files to where you need them.

Clones

As the name implies, a clone is an independent copy of a data set. Once created, a clone is not updated with changes made to its source.

LiveClones

A LiveClone is a clone that can be updated with changes from its source. For example, a LiveClone made from a mailbox database or a consistency group of mailbox databases could be updated with changes.

LiveClone updates consist of only the blocks that changed at the source. Updating with only the changed blocks minimizes the amount of time required to perform an update.

Restores

The restore function reverts production data to a specified point in time. Restores and clones are the only data access operations that actually move data. Typically restore operations are performed to restore a data to a valid state after a massive data corruption or storage array failure. The amount of time required to complete a restore operation depends on the amount of data involved.

When restoring a Microsoft® Exchange Database keep in mind:

- For Database Availability Groups, the Actifio appliance backs up the passive node, but restores to the active node by first dismounting the existing database and mounting the restored database in its place.
- Microsoft® does not support restoring an entire VM that hosts Microsoft® Exchange Database(s) or restoring a Microsoft® Exchange Database over an existing one, or over a non-functional database or VM. If a Microsoft® Exchange node goes down, rebuild it using Microsoft® standard practices and then mount a database snapshot and copy the needed files into the new Microsoft® Exchange Database.
- If a user account is deleted along with its mailbox, the restore operation will bring back the mailbox but not the user account.
- All members of a consistency group are restored to their original location.

Object Level Recovery

In addition to restoring information at the mailbox level, Actifio appliances allow users to recover individual Microsoft Exchange objects. Actifio appliances provide the capability to open a Microsoft® Exchange database and copy objects from a backup image to PST files or back to the production Exchange instance. This capability is further enhanced by Actifio's ability to provide instant access to the entire Exchange database in just seconds.

To recover an individual mailbox or email, you simply have to select a capture point, mount it to a server, and drag and drop the objects to the recovery destination.

The following figure is an example of an object level recovery session:

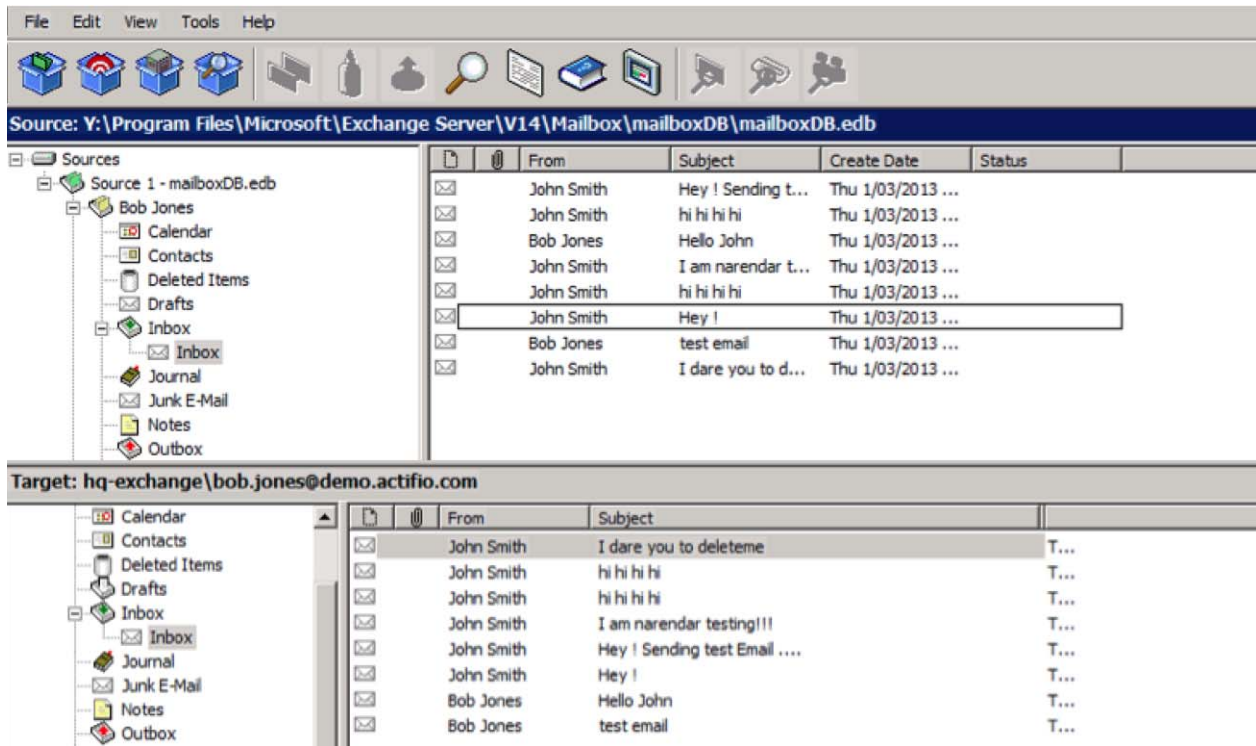


Figure 6 Microsoft Exchange Object Level Recovery

About Actifio

Actifio is radically simple copy data management. Our copy data management lets businesses manage and recover anything instantly, for up to 90 percent less. Actifio eliminates siloed data protection applications, virtualizing data management to deliver an application-centric, SLA-driven solution that decouples the management of data from storage, network, and server infrastructure. Actifio has helped liberate IT organizations and service providers of all sizes from vendor lock-in and the management challenges associated with exploding data growth. Actifio is headquartered in Waltham, Massachusetts, with offices around the world. For more information, please visit www.actifio.com or email info@actifio.com.