Getting Started with Actifio Copy Data Management
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Preface

The information presented in this guide is intended for users who are new to managing and accessing data with an Actifio CDS or Sky appliance. This document assumes that the Actifio appliance(s) have been installed and are ready to begin managing your data.

Your Actifio appliance’s Documentation Library contains detailed, step-by-step, application-specific instructions on how to protect and access your data. Each guide is in PDF format and may be viewed online, downloaded, or printed on demand. The following guides will be of particular interest:

- Setting Up Users and Roles With the Domain Manager
- Configuring Resources and Settings With the Domain Manager
- Connecting Hosts to Actifio Appliances
- Planning and Developing Service Level Agreements
- Virtualizing and Protecting Copy Data with the Application Manager
- Accessing and Recovering Copy Data with the Application Manager
- Replicating Data Using Actifio Appliances

The Actifio Now Customer Portal

During the configuration and initialization of your Actifio appliance your Actifio representative provided you with a user name and password for the Actifio Now customer portal.

From the customer portal you can obtain detailed reports about your Actifio appliance as well as search the portal’s knowledge base for answers to specific questions.

To log into the ActifioNOW customer portal:

1. Go to: https://now.actifio.com
2. When prompted, enter the user name and password provided by your Actifio representative.

Actifio Support Centers

To contact an Actifio support representative, you can:

- Send email to: support@actifio.com
- Call:
  - From anywhere: +1.315.261.7501
  - US Toll-Free: +1.855.392.6810
  - Australia: 0011 800-16165656
  - Germany: 00 800-16165656
  - New Zealand: 00 800-16165656
  - UK: 0 800-0155019
Actifio CDS and Sky appliances are highly scalable copy data management platforms that virtualize application data to improve the resiliency, agility, and cloud mobility of your business. They virtualize data in much the same way other technologies have virtualized servers and networks. Actifio appliances enable 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.

**Actifio Copy Data Management**

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 be accessed instantly for use, without proliferating physical copies and taking up additional storage infrastructure.
This chapter provides an overview of the basic concepts used by an Actifio appliance to capture, manage, and access data. Understanding these concepts will allow you to effectively capture, manage, and access data with an Actifio appliance.

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### Actifio Appliances

An Actifio appliance can be a physical or virtual server. The Actifio physical appliance is referred to as Actifio CDS. The Actifio virtual appliance is referred to as Actifio Sky.

### Local and Remote Appliances

Multiple Actifio appliances can be joined in any combination of primary and secondary relationships. An exchange of certificates is required to join appliances. Once joined, application data can be replicated between appliances. Local and remote are relative to where you are logged in. The Actifio appliance you are logged into is the local Actifio appliance and the other Actifio appliances are considered remote.

### Actifio CDS

An Actifio CDS appliance is a hardware and software solution. An Actifio CDS appliance captures and manages data locally and can replicate protected data to other Actifio CDS and Sky appliances. Actifio CDS appliances are installed and configured by your Actifio representative.

### Actifio Sky

An Actifio Sky appliance is a virtual machine. Actifio Sky appliances are licensed by capacity. An Actifio Sky appliance captures and manages data locally and can replicate protected data to Actifio CDS appliances.
**Actifio Sky for AWS**

An Actifio Sky for AWS appliance is a virtual machine that is licensed by capacity and resides in the AWS cloud space. An Actifio Sky appliance captures and manages application data in the AWS cloud and can replicate captured data to another location. The underlying engine for Actifio Sky for AWS is Actifio Sky.

**VDisks**

Actifio appliances use VDisks (virtual disks or volumes) to virtualize copy data from hosts. VDisks are logical disks taken from a pool of managed disks (MDisks) presented to an Actifio appliance from one or more internal and external arrays.

From the VDisks, the data can be deduplicated, cloned, mounted and recovered, presented for test and development work, and manipulated in other tasks.

VDisks are created as needed on physical disk arrays.

There is a fixed limit of VDisks per Actifio appliance. As you create protection policies, your Actifio appliance will warn you when a configuration may exceed VDisk limits.

For detailed information on VDisks see the *Configuring Resources and Settings with the Domain Manager* guide in the Actifio Documentation Library or the Actifio Now customer portal.

**Staging and Snapshot VDisks**

A staging disk is a VDisk created when an application is first protected. It is a copy of the latest captured image of production data. Each staging disk is associated with a number of snapshots. The number of snapshots for each application or VM is determined by how often snapshots are made and how long they are retained.

A staging disk is a complete copy of the production application data or VM. Snapshots made from the staging disk reference the data in the staging disk, so they are much smaller, but they can grow over time.
Resizing a Database Log’s Staging VDisk

The physical space required to accommodate a database’s logs is automatically managed by the Actifio appliance. At a minimum, the Actifio appliance will evaluate typical log sizes and their retention period and add space as needed.

To more efficiently and effectively manage the storage requirements for a database’s logs, Snapshot policies provide the following advanced settings:

- **Log Backup Retention Period** - Log retention is defined separately from the retention of the Snapshot policy. Having a separate retention period allows you to use logs in conjunction with copies of the database stored in both the Snapshot and Dedup pools. The log retention period is a mandatory setting.

- **Log Staging Disk Size Growth** - Defines the percent at which to automatically grow the staging VDisk on which the logs reside. This setting is from 5 to 100 percent.

- **Estimated Change Rate** - Defines the daily change (in percent), which allows the Actifio appliance to better calculate the size of the staging disk needed to hold logs. This setting is from 0 to 100.

- **Compress Database Log Backup** - Instructs the source database to compress its logs before capture by the Actifio appliance. The database server performs log compression during log backup.

If required, you can replicate Oracle or Microsoft® SQL Server database logs to a remote Actifio appliance. You can use the logs at the remote site for any database image within the retention range of the replicated logs. For a log replication job to run, there must be a replication policy (StreamSnap, Dedup-Async, or Remote Dedup) included in the template, and at least one successful replication of the database must first be completed.

For details on database log advanced settings, see the *Planning and Developing Service Level Agreements* guide in the Actifio Documentation Library or the Actifio Now customer portal.

Pools

An Actifio appliance uses pools of allocated storage to store data.

During initial installation, your Actifio representative will configure pools and when needed, allocate storage space in your environment. The amount of space to be allocated is based on how data is managed (see Data Capture Methods on page 7), how much data is involved, the type of data, its change rate, how long it will be retained, and whether or not the data is replicated to another Actifio appliance.

**Snapshot Pool**

The Snapshot Pool holds the most recent copies of your captured application data. Snapshot Pools retain protected data for short-term retention. Data is instantly accessible and not deduplicated. Policies determine how long data is kept in this pool and when or if data is deduplicated and moved to another pool.

Snapshot Pool space is consumed by three types of VDisks:

- **Staging VDisks**: Staging VDisks are the Actifio golden copy of the application. Staging VDisks are retained for as long as an application is protected.

- **Snapshot VDisks**: Snapshots are used to preserve the state of staging disks at specific points in time. Snapshots are retained according to a predefined policy.

- **Clone VDisks**: Clone VDisks are full copies of an application’s production data. Clone disks are not automatically expired.

Snapshot space is also consumed when rehydrating images from the Local Deduplication Backup Pool.

Data that is replicated from a local Actifio appliance to a remote Actifio appliance via a Production to Mirror policy will land in the in the remote Actifio appliance’s Snapshot Pool.

**Dedup Pool**

The Dedup Pool is used to retain deduplicated copies of snapshot data and to facilitate low-bandwidth replication. You can create a policy that writes VMware VM data directly to this pool, where it bypasses the Snapshot Pool and is deduplicated directly in this pool.
Note: Keep space for Dedup Pools on spindles separate from space for Snapshot Pools. Dedup operations are I/O intensive. Keeping Dedup Pools on separate spindles ensures that dedup operations will not impede the performance of the Snapshot Pools.

Data that is replicated from a local Actifio appliance to a remote Actifio appliance via a Dedup Backup DR policy will land in the in the remote Actifio appliance’s Dedup Pool.

OnVault Pool

An OnVault Pool defines the storage that can be used by an Actifio Snapshot to OnVault Policy. Data is not deduplicated when it is sent to an Actifio OnVault Pool. Actifio OnVault Pools are used for long-term storage and should not be used for primary data storage. See also: Sending Snapshots to an OnVault Pool’s Defined Storage on page 14.

Policy Templates and Policies

A Policy Template is a collection of policies. A policy defines:

- The source of the data managed by the policy
- Type of the protection operation
- Frequency of the protection operation
- How long to retain the data
- Whether data is replicated

Multiple policies within a template allow you to create a singe template that defines the short term and long term retention of data as well as whether data will be replicated and how long replicated data will be retained.

Depending on the Actifio appliance type, a Policy Template can be made up of one or more of the following policies:

**Production to Snapshot** defines when and how often production data will be captured and how many snapshots are retained. Data recovery from the Snapshot Pool is fast because images are not deduplicated and are stored in the local Actifio appliance’s Snapshot Pool. Snapshots are meant for short term retention. See Production to Snapshot Policies on page 69 for details.

**Snapshot to Dedup Backup** defines when to deduplicate snapshot data and how long to retain the deduplicated data. Data in the Dedup Backup Pool is meant for longer term retention. See Snapshot to Dedup Backup Policies on page 69 for details.

**Production to Mirror** defines how data will be replicated to a Mirror Pool (a Snapshot Pool on a remote Actifio appliance). Data in the Mirror Pool is meant for instant recovery in a disaster recovery scenario. See Snapshot to Dedup Backup Policies on page 69 for details.

When creating a Production to Mirror Policy you have the choice of replicating data via:

- StreamSnap - Used in environments that have high bandwidth networks
- Dedup-Async Replication (DAR) - Used in environments where network bandwidth is constrained
- Synchronously (Sync) - Used by Actifio CDS appliances to capture generic applications
- Asynchronously (Async) - Used by Actifio CDS appliances to capture generic applications

For details on replicating data, see Replicating Data on page 13.

**Dedup Backup to Dedup DR** defines when to replicate deduplicated data to a remote Actifio appliance’s Local Dedup Pool and how long to retain the data in that pool. Data in the Dedup DR Pool is meant for retention of data in case of a disaster at the local appliance’s site. See Dedup Backup to Dedup DR Policies on page 70 for details.
**Production Direct-to-Dedup** defines when to deduplicate VMware VMs directly from production data and how long to retain the deduplicated data. Capturing VMware VMs directly to a Dedup Backup Pool is meant for long term retention when instant access from a Snapshot Pool is not required. See *Production Direct to Dedup Policies* on page 72 for details.

**Snapshot to OnVault** defines when to send Production to Snapshot data to the storage defined by an Actifio OnVault Pool and how long to retain the data. Snapshot to OnVault Policies are meant for long-term retention of data. See *Snapshot to OnVault Policies* on page 70 for details.

Policy Templates are:

- Created in the Actifio Service Level Architect (SLA) service, as described in *The SLA Architect* on page 38.
- Applied to applications in the Application Manager service, as described in *The Application Manager* on page 40.

For details and best practices for Policy Templates and Policies see *Planning and Developing Service Level Agreements*. This guide can be found in the Actifio Documentation Library or the Actifio Now customer portal.

**Resource Profiles**

Resource profiles define where application data is retained. They define which pool to use; Snapshot, Dedup, or OnVault. Pools specified in Resource profiles are used along with policy templates to form an SLA for an application. Resource Profiles are:

- Created in the Actifio Service Level Architect (SLA) service (see *The SLA Architect* on page 38).
- Applied to applications in the Application Manager service (see *The Application Manager* on page 40).

**Data Capture Methods**

An Actifio appliance provides three basic methods for managing production data: Out-of-Band, In-Band, and LAN-Free. A single Actifio appliance can capture some applications Out-of-Band, some In-Band, and other applications LAN-Free.

*Note: Your Actifio representative will work with you to determine which approach best meets your data capture and access needs.*

**Out-of-Band**

This is the most common method used when managing data. Production data is controlled by a non-Actifio storage controller on your existing storage arrays. The Actifio appliance operates outside of the application’s data path and leverages the IP network. The Actifio appliance moves and captures the application data separately from where the application writes its primary storage.

Snapshots of application data are captured and stored on a staging disk presented to the application host via Fibre Channel or iSCSI.

The Out-of-Band method will meet the needs of most users who want to capture and access:

- **Hypervisors:** VMware and Hyper-V
- **Applications:** Oracle, SQL, Exchange, SharePoint, SAP on Oracle
- **File Systems:** Windows, Unix, Linux file systems
An Actifio appliance captures copy data by presenting a staging disk that maintains a golden copy of the application’s historical data. Data is captured using Actifio snapshots.

**Typical Out-of-Band Capture Method**

When capturing data Out-of-Band:

- A staging disk is mounted on a server via Fibre Channel or iSCSI.
- An initial capture of the entire image is made to the staging disk.
- Subsequent captures consist only of incremental changes. This is made possible by taking advantage of change block tracking via the Actifio Connector or by VMware APIs. See *Capture Mechanisms* on page 9 for details.
- The staging disk is unmounted on the server.
- A snapshot of the staging disk is made on the Actifio appliance.

**In-Band**

*Note: In-Band is not applicable to Actifio Sky appliances.*

With the In-Band method, production data storage is controlled by the Actifio appliance. Snapshots and changed-block tracking are native to the Actifio appliance. The appliance resides in the data path between the SAN and the application host.

You can use the In-Band method on production data that is on a Fibre Channel LUN(s) on an Actifio appliance-supported storage array AND if one or more of the following conditions apply:

- The application is not a supported Out-of-Band application; for example, DB2 or a custom application.
- The local RPO requirements are shorter than what is practical for Out-of-Band. For example, when snapshots are required every 15 minutes.
- The remote RPO requirements are shorter than what Actifio Dedup Async Replication (DAR) allows. For example, requirement states instant sync/async.
- There is a large amount of data; for example, a 10TB database
- The applications and the files on them need to be captured. It is more efficient to capture blocks of data than the applications and their files. For example, a Linux file system with 21 million files.
LAN-Free
To capture VMware VMs, an Actifio appliance can employ LAN-Free data capture.

*Note: Capturing VMs does not apply to Actifio Sky for AWS.*

To use the LAN-Free data capture method the SAN administrator simply has to:
1. Use Fibre Channel SAN zoning to provide the Actifio appliance access to the storage controller that manages the ESXi datastores.
2. Ensure that the storage controller is supported by the Actifio appliance.
3. Define the Actifio appliance as a host
4. LUN mask all datastore LUNs to the Actifio appliance host.

The Actifio appliance will detect whether the ESXi datastore LUNs are accessible via Fibre Channel. If they are available, data will be moved across the Fibre Channel SAN.

In all other aspects LAN-Free is the same as Out-of-Band.

*Note: If the SAN administrator fails to map the required datastores, or maps a required datastore away from the Actifio appliance, then the appliance will switch to LAN-based data capture.*

LAN-Free vs Out-of-Band
LAN-Free and Out-of-Band Fibre Channel are both LAN-Free, although Command and Control is still done over the LAN. The difference is the source HBA.

- In LAN-Free, Actifio reads the data direct from the storage HBA (Actifio is Initiator)
- In Out-of-Band over Fibre Channel, Actifio is sent the data by the host HBA (Actifio is target).

Capture Mechanisms
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 either the Actifio Connector or VMware API calls.

*Note: Capturing VMs does not apply to Actifio Sky for AWS.*

The Actifio Connector
The Actifio Connector is used to capture selected applications and for capturing entire Hyper-V VMs. The Actifio Connector is a small-footprint, operating system specific, lightweight service that can be installed on either virtual or physical servers.

The Actifio Connector provides a more granular data capture capability than what is provided by VMware API calls. It allows you to: Capture selected applications, capture applications that cannot be snapped by VMware, capture Microsoft SQL Server clusters, and Microsoft Exchange Database Availability Groups (DAGs).

Specifically, Actifio Connectors:
- Discover applications
- Quiesce applications, for application consistency during capture
- Enables change block tracking for Actifio’s incremental forever capture strategy
- Capture and manage transaction logs:
- Capture database(s) and logs with one policy template
- Truncate database transaction logs
- Roll database transaction logs forward for point-in-time recovery when accessing virtual copies

- If multiple applications are resident on a server, a single policy template can be applied to multiple applications.
- Avoids VMware VMs “stun” issues

For Hyper-V Servers, the Actifio Connector also enables the capture of entire Hyper-V VMs.

The Actifio Connector also enables scripting on the hosts on which it is installed. The Actifio Connector (host side) scripts can be invoked for:

- On-demand jobs triggered from the Actifio CLI with the `-scripts` argument.
- Pre- and post-phases of an Actifio appliance Workflow job.

For detailed step-by-step instructions on how use Actifio appliance scripting, see *Connecting Hosts to Actifio Appliances* in the Actifio Documentation Library or the Actifio Now customer portal.

**VMware API Calls**

An Actifio appliance can take advantage of VMware APIs for data protection (VADP) calls to capture an entire virtual server. Specifically, the API calls:

- Enable change block tracking -for Actifio’s incremental forever capture strategy.
- Quiesce applications for application consistency during capture.

When an entire virtual server is captured, a fully functional virtual server (operating system, applications, and their data) is captured. Having a copy of the entire virtual server guarantees that the data can be accessed fast and without issues. Because the image presented is a fully functional virtual server, if needed, it can be started and run from an Actifio appliance directly and then optionally migrated to a new, permanent location.

Virtual machines and their applications can be grouped and captured with a single Policy Template.
Capture Options

An Actifio appliance allows you to:

- Capture Individual and Groups of Applications on page 11
- Capture Application Data in Actifio Consistency Groups on page 11
- Capture a VM’s Applications and Boot Volume on page 12
- Capture Entire VMware and Hyper-V VMs on page 12
- Capture Generic Applications on page 12
- Capture Database Logs on page 13

Capture Individual and Groups of Applications

The Actifio Connector is used to capture individual and groups of applications on physical and virtual servers.

Managing Individual or Groups of Applications

Installing the Actifio Connector on a physical server or VM allows you to create a single Policy Template to capture all applications on the server or several Policy Templates to capture groups of applications.

Capture Application Data in Actifio Consistency Groups

A consistency group is enabled by the Actifio Connector. 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 Template.

If Actifio’s Database Log Backup option (Microsoft SQL Server and Oracle only) is enabled on a Snapshot policy, then all databases captured by the Policy Template in which the Snapshot policy resides can be recovered to the same point-in-time. Recovery and rolling forward of the logs (for databases) in a group is performed via the Actifio user interface with a single action.

In addition to making capture and recovery operations easy and fast, consistency groups consume fewer system resources (VDisks).
Capture a VM’s Applications and Boot Volume

Note: Capturing VM Boot Volumes does not apply to Actifio Sky for AWS.

When managing applications on VMs you have the option of also capturing the VM’s boot volume. When a VM’s boot volume is captured along with its applications, an image can be presented that is a fully functional VM. The image can then be migrated to a new, permanent location if needed.

Capture Entire VMware and Hyper-V VMs

To capture entire VMware VMs, the Actifio appliance takes advantage of VMware APIs. To capture entire Hyper-V VMs, the Actifio appliance uses an Actifio Connector installed on the Hyper-V server.

Note: Capturing VMs does not apply to Actifio Sky for AWS.

Managing Entire VMs

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

When an entire virtual server is captured, a fully functional virtual server (operating system, applications and their data) is captured. Having a copy of the entire virtual server guarantees that the data can be accessed fast and without issues. Because the image presented is a fully functional virtual server, it can be migrated to a new, permanent location if needed.

Capturing whole virtual servers allows groups of virtual servers and their applications to be protected with a single Policy Template.

Capture Generic Applications

The Generic Application type is used to capture data for applications that do not have dedicated, application specific, Actifio data capture processes. In addition, there are some instances where applications that do have dedicated processes will use the generic application type for data capture.
Capture Database Logs

Database log capture is enabled in a Snapshot policy’s Advanced Options. It enables a single Snapshot policy to capture logs for Microsoft® SQL Server databases, Oracle databases, and consistency groups that contain Microsoft® SQL Server databases or Oracle databases.

The frequency at which database logs are captured is defined separately from that of the database. For example, a database can be captured every day and its logs captured every hour.

The frequency of database log backup is set in minutes, and the frequency at which logs are captured must not exceed the frequency at which its associated database is captured. For example, if a database capture frequency is every 24 hours, the log file capture frequency must be less than every 24 hours.

Log retention is defined separately from the retention of the Snapshot policy. Having a separate retention period allows you to use logs in conjunction with copies of the database stored in both the Snapshot and Dedup pools. For example:

If a database’s Snapshot data is kept for three days and its Dedup data kept for seven days, you can define log retention to span all seven days.

In this example, a single captured database image can be selected and its logs can be rolled forwards over the seven day period.

Database logs are not deduplicated, and regardless of how many logs are captured during a specified log retention period, a database’s captured logs are staged to a single VDisk in the Actifio Snapshot pool. To conserve space in the Snapshot pool, you can use an advanced setting to instruct the database to compress its logs.

If required, you can specify to replicate Oracle or Microsoft® SQL Server database transaction logs to a remote Actifio appliance. You can use the logs at the remote site for any database image within the retention range of the replicated logs. Log replication uses StreamSnap technology to perform the replication between the local and remote Actifio appliances; the replication goes directly from the snapshot pool of the local Actifio appliance to the remote snapshot pool. For log replication jobs to run, there must be a replication policy (StreamSnap, Dedup-Async, or Remote Dedup) included in the template and a resource profile that includes a remote Actifio appliance, and at least one successful replication of the database must first be completed.

Replicating Data

Replication of copy data to remote storage protects the data in the event of disaster at the primary site and reduces the amount of storage required at the primary site. The goal of replication is to get your data back in situations of data loss and impact to your production systems due to issues such as a hardware failure, software issues, or a site event. Data replication also supports the creation of remote copies of Test/Dev, QA, and Analytics data. Data can be replicated from one Actifio appliance to a second (remote) appliance or to the cloud for recovery, disaster recovery, or test/development purposes.

Note: Details about the different types of replication methods supported by the Actifio CDS and Sky appliances along with step-by-step instructions on their use can be found in Replicating Data Using Actifio Appliances in your Actifio Documentation Library and on the Actifio Now customer portal.

Your SLA templates determine the method, schedule, and frequency of how data replication to a remote site is to be performed. The SLA template defines how to move and store data efficiently to the remote Actifio appliance. Data replication is controlled by the individual template policies:

- Dedup Backup policies use an Actifio proprietary replication engine to replicate data to a second Actifio appliance. Dedup Backup is efficient for the long-term storage (weeks to months) of captured and deduplicated data to a remote Actifio appliance. Dedup Backup is intended to retain data for a medium to long-term retention period (for example, 3 months to a year). In addition, Second Hop Replication policies allow you to replicate dedup backup data to a second location operating as the second-leg in a multi-hop configuration of joined Actifio appliances. For details see Dedup Backup to Dedup DR Replication on page 14.
• Production to Mirror policies protect your application or VM data against a site failure by having a full copy of that data mirrored to a remote production site. Applications are kept up-to-date and can be re-started at a moment’s notice at the remote site by accessing data from the remote DR copy. Data mirroring can be considered as access optimized replication to a remote site. For details see Production to Mirror Policy Replication on page 14.

• Snapshot to OnVault policies use an HTTPS connection to send data to storage defined by an Actifio OnVault Pool. Data sent to storage defined by an Actifio OnVault Pool is not deduplicated. The compress option is on by default in Actifio OnVault Pools. For details see Sending Snapshots to an OnVault Pool’s Defined Storage on page 14.

**Dedup Backup to Dedup DR Replication**

Dedup Backup replication is efficient for long-term storage of captured and deduplicated data to a remote Actifio appliance. Data replicated using a Dedup Backup policy is transmitted from the local Actifio appliance dedup pool to the dedup pool managed by another Actifio appliance. The need for and number of Dedup DR copies to retain on a second Actifio appliance for long-term data recovery (LTDR) is driven by offsite retention requirements for the data.

Dedup Backup uses a Dedup Backup to Dedup DR policy. Dedup Backup replication is incremental, globally deduplicated, and compressed and encrypted in flight. The Dedup Backup replication process begins after the deduplication process completes. A proprietary deduplication-aware replication protocol enables the transmission of only the globally unique blocks, which minimizes the bandwidth required to move data between Actifio appliances.

Blocks are compressed and encrypted in flight for the most efficient bandwidth utilization. Deduplication and compression optimize the data set for transport between sites, eliminating the cost of WAN optimization.

Dedup Backup replication also provides an added benefit of allowing data to be replicated to a remote site, and then from that remote site to a second remote site. This feature is referred to as multi-hop. You can use this process if need to perform on-demand replication of a backup dedup image to a remote Actifio appliance that is part of a multi-hop configuration of joined Actifio appliances.

**Sending Snapshots to an OnVault Pool’s Defined Storage**

The Snapshot to OnVault policy allows you to send snapshot data to a location defined by an Actifio OnVault Pool. A schedule within the policy is used to send the most recent snapshot taken by the Policy Template’s Production to Snapshot policy to the location defined by the Actifio OnVault Pool. Actifio OnVault Pool storage is typically used for long-term retention. For details on the OnVault Pool, see OnVault Pool on page 6.

When sending data to a storage defined by an Actifio OnVault Pool, an HTTPS connection is used to ensure data security over the network. The OnVault Pool’s compression option is on by default to minimize network traffic.

Data sent to the Actifio OnVault Pool storage is not deduplicated. However, after the initial ingest of the full snapshot, only the changes to data are sent to the OnVault Pool. This is the same incremental forever model used by other Actifio policies.

When accessing data in an Actifio OnVault Pool’s storage:

- Actifio CDS and Sky appliances can create clones.
- Actifio CDS and Sky appliances can mount data, but because data will first be copied to the snapshot pool then mounted, it is not recommended.
- LiveClones cannot be created.

**Production to Mirror Policy Replication**

Production to Mirror policies provide a means to replicate a copy of the application or VM data to a target Actifio appliance and to have data access without a restore window, providing for very low RTO. As needed, you have the ability to perform a failback to the production site with an identical set of data that is mirrored between the local and remote Actifio appliances.
**StreamSnap**

StreamSnap facilitates high-availability by allowing you to keep a remote copy of an application’s storage and configuration up-to-date and ready for a failover scenario. When a StreamSnap-managed application fails, you mount a failover image of the application from the remote site. When the problem has been resolved, then you can restore the syncback image to the local site with the latest changes and then failback the application to the production site.

StreamSnap replicates data snapshots that are not deduplicated to a remote Actifio appliance over a high quality bandwidth IP network, which can provide RPOs as low as one hour.

- For VMware VMs, snapshot replication is streamed to the second Actifio appliance in parallel. Streaming of a VMware VM is performed to avoid waiting until the local snapshot job completes before initiating replication.
- For non-VMware VM applications, snapshot replication occurs after the local snapshot job is completed.

**Note:** StreamSnap replication and local snapshots are integrated to avoid the creation of double snapshots. The Actifio appliance allows you to maintain multiple local snapshots and store local images in the Dedup pool for long-term retention.

Production to Mirror policies that use StreamSnap replication are tied to a specific Production to Snapshot policy. They use the schedule and frequency settings of their associated Production to Snapshot policy.

You have the option to retain snapshot images from multiple available points in time at the remote site by applying retention in a StreamSnap policy. When retaining snapshot images at the remote Actifio appliance, a new snapshot image will be created at the remote appliance with an expiration date determined by the policy settings. Each remote snapshot image supports all operations available with a local snapshot image when accessed from the Application Manager.

StreamSnap replication requires a reliable network connection to replicate data snapshots to the remote Actifio appliance. The bandwidth required on the network connection is directly related to the application size (initial copy) and amount of change (for incremental updates).

**Dedup Async (DAR)**

Dedup-Async Replication (DAR) allows you to keep a remote copy of an application's data up-to-date and ready to be used in a failover scenario, facilitating high-availability and redundancy. When a DAR-managed application fails for any reason, you can mount a failover image of the application at the remote site. When the problem has been resolved, then you can incrementally reverse replicate the changes made at the DR site to the primary site and then failback the application to the production site.

DAR is an Actifio-proprietary form of replication where initially a full copy of the application data is replicated to a target Snapshot pool on the second Actifio appliance or when a VM is replicated to the datastores of an ESX server. Dedup-Async replication sends deduplicated and compressed data over the network at a fraction of the bandwidth required for traditional replication technologies.

Once the Dedup-Async job takes a snapshot, it deduplicates the data, replicates the deduplicated data to another Actifio appliance, rehydrates that data on the second Actifio appliance, and updates the full copy of data on the second Actifio appliance to provide the flexibility of instant access at the remote location. This ensures that a full, up-to-date copy of data is ready and available on the second Actifio site.

Because the data is deduplicated before it is replicated, DAR requires less network bandwidth than StreamSnap replication but it does require additional Actifio system resources.

**Note:** Production to Mirror policies that use DAR make snapshots of their own. They do not use a snapshot created by another Production to Snapshot policy.
Sync and Async Replication Options

Sync and Async replication are forms of data mirroring that enable instantaneous failover/failback of production data for high availability. Both Sync and Async Replication are used only by Actifio CDS appliances to protect in-band generic applications; they are not intended for use by Actifio Sky appliances.

- **Sync (Synchronous) Replication** - Sync Replication is used for real-time data mirroring. It uses a fibre channel connection between locations, and supports connectivity to Actifio appliances located distances of 300KM apart. Sync replication can have a production data performance impact as every write operation must be replicated to the remote site before it is acknowledged to the host performing the write.

- **Async (Asynchronous) Replication** - Async Replication is also used for real-time data mirroring to a remote site, but it has no distance limitation. Async Replication will send data over the WAN as fast as network bandwidth allows. Async replication does not impact production data performance as it allows replication to fall behind and catch up using caching techniques.

Data that is replicated using either Sync and Async is not deduplicated. Both Sync and Async replication captures in-band data in real time; blocks are sent as they change. As an example, if you protect 100TB of production data with Sync and Async replication, then you must mirror 100TB of data at the remote Actifio appliance.

Actifio Big Data Director (BDD)

The Actifio Big Data Director (BDD) is a 2U rack-mountable hardware addition for your Actifio CDS appliance that turns the appliance into an efficient platform for reliably capturing, archiving, replicating, and recovering a variety of unstructured data from large file systems. Petabyte-sized unstructured datasets have become common in the enterprise. A BDD node enables you to capture the file system production data that resides on the large-scale NAS servers in your environment. Each BDD node provides the necessary CPU, memory, and network bandwidth for the Actifio CDS appliance to capture and export NAS file-level data, and to dedup this data. The Actifio CDS appliance supports network connectivity with up to eight BDD nodes.

Partial or full NAS shares protected by the Actifio CDS appliance using a BDD Node are called NAS datasets. NAS datasets are the data from the Isilon NAS servers that are virtualized by the Actifio appliance and stored on an Actifio BDD node. You protect a NAS dataset by binding a resource profile and a template to it to make an SLA. You can then mount a backed-up NAS dataset and export it to an NFS or CIFS share.

**Note:** NAS datasets, NAS servers, and the Actifio BDD node are not applicable to Actifio Sky or Actifio Sky for AWS appliances.

Garbage Collection (GC)

The amount of storage consumed by the Dedup Pool grows over time, depending on the amount of unique data added with each new image that is ingested. As each image is expired, the space occupied by the unique data that was represented by that image is not immediately reclaimed. The garbage collection process identifies (and later reclaims) space occupied by this no-longer-needed data.

Full GC is very effective, but it can impact system performance and time-consuming. The first Full GC you run can take days to complete. Check the **Est. Runtime** in the Predictive Statistics block in the lower left. The estimate values are derived from the results of the last run.

The more often you run GC, the less time subsequent GC operations require.
**Managed Data License**

Managed Data License (MDL) is a measure of Actifio-protected copy data. The measure of protected data varies by application. For example:

- File Systems: MDL equals the total size of protected files.
- Oracle databases: the total size of protected database files.
- SQL Server, Exchange, and SharePoint: the total size of protected database files, including any log files OR the size of the disks (if it is inband).

Volumes protected in-band with Sync or Async replication and Generic applications: the total size of all protected volumes.

**Local vs Mapped File Systems**

The Actifio Desktop refers to:

- Local File Systems as FILESYSTEM
- Mapped File Systems as NFS and CIFS
3 Installing and Configuring the Actifio Desktop

This chapter walks through the installation of an Actifio Desktop. The initial installation and set up of local and remote Actifio appliances is performed by an Actifio representative. Once the Actifio appliances are up and running, you can download and install the Actifio Client on your local desktop.

**Note:** Before you begin, you will need the user name and password pair to log in to the Actifio appliance.

Downloading and Logging into the Actifio Desktop

**Note:** The Actifio Desktop runs on Adobe AIR. System requirements for Adobe AIR are on the Adobe Website.

To download the Actifio Desktop to your desktop:

1. In a browser window, enter the IP address of your Actifio appliance and the Actifio Resource Center is displayed:

   ![Actifio Resource Center](image)

   To manually install the Actifio Desktop, click on the links below:
   - Download the Adobe Air Player
   - Download the Actifio Desktop Air File

   **CONNECTORS**
   - Windows Connector
   - AIX Connector
   - HP-UX Connector
   - Solaris Connector
   - Linux Connector

   **REPORT MANAGER**
   - Deployment guide

   **SNMP RESOURCES**
   - MIB

   **LICENSES**
   - Additional Software Licenses

   **DOCUMENTATION**
   - Release Notes and Product Documentation via the Actifio NOW Website (Login Required)
   - Download zipped Actifio Enterprise Documentation Library

2. Click **Install Now** and both the Actifio Desktop and Adobe Air Player will be downloaded and installed on your desktop. This page also provides links to download and install these items separately.
3. When the Actifio Desktop is installed, the Actifio Desktop login page is displayed. In the spaces provided, enter:
   - Login credentials (user name and password)
   - IP address or name of the Actifio appliance

4. Click Sign in and the Actifio Dashboard is displayed:

   For details on the Actifio Dashboard, see Using The Actifio Dashboard in the Actifio Documentation Library or the Actifio Now customer portal.
Setting Up Your Actifio Desktop

The Desktop settings are configured in three tabs:

- Desktop Settings Tab on page 21
- User Settings Tab on page 22
- System Settings Tab on page 23

To configure Actifio Desktop settings, click the gear icon at the bottom of the Actifio Desktop:

**Desktop Settings Tab**

The Desktop Settings tab is the default tab. Use the Desktop Settings tab to configure the Debug and Auto Update modes.

To configure Desktop Settings:

1. Click the Software & Settings icon at the bottom of the screen. The Desktop Settings window opens to the Desktop Settings tab.
2. Select the service that you want to see when you open the Actifio Desktop.

**Enable or disable debug mode:** In the unlikely event that an issue arises with your Actifio appliance, detailed information about your Actifio appliance can be captured using Debug Mode. In Debug Mode, all API calls are logged in a file named `actifio-logger.log`. This log file is stored under user’s home directory, for example: `C:\Users\<User Machine Name>\actifio-logger.log`. By default, this is set to `OFF`. Your Actifio representative may ask you to enable this mode to help in troubleshooting. Otherwise leave it disabled.

**Enable or disable automatic updates:** When enabled, this setting allows your Actifio Desktop client to periodically check for a newer version or updates installed on your CDS cluster. The Desktop prompts you with a message whenever there is an update. By default, this is set to `ON`.

---

**Note:** Updates are made only to the Actifio Desktop client. It does not update the Actifio appliance.
User Settings Tab

Use the User Settings tab to configure the startup service displayed when you open the Actifio Desktop. The Actifio Dashboard service is selected by default.

To configure user settings:

1. Click the Software & Settings icon at the bottom of the screen. The Desktop Settings window opens.
2. Click the User Settings tab.
3. Select the service that you want to see when you open the Actifio Desktop.
System Settings Tab

Use the System Settings tab to enable Actifio SecureConnect remote service access mode. By default, this is set to OFF.

When you enable Actifio SecureConnect, Actifio Customer Support engineers can access your system remotely on an as-needed basis. As a situation requires, they can manage major upgrades and service pack updates and hotfixes, phase out failing hardware, collect log data on history of failures, restart data and I/O modules, change the configuration of ports, and more. All actions are documented in the Actifio appliance audit log and in the Actifio installation/problem reporting databases for further review.

After you enable the connection through the Actifio Desktop, your Actifio appliance establishes a secure point-to-point connection to a secure server at the Actifio Global Support Center, enabling remote access from the Actifio Global Support Center to your Actifio appliance.

For details on the use of Actifio SecureConnect and remote support, see Actifio Remote Support Options included in the Actifio Documentation Library and the Actifio Now customer portal.

To enable SecureConnect mode:

1. Click the Software & Settings icon at the bottom of the screen. The Desktop Settings window opens.
2. Click the System Settings tab.
3. Set SecureConnect to ON.
This chapter describes the components of the Actifio Desktop user interface:

- **The Top Strip** on page 26
- **The Service Menus** on page 27
- **The Bottom Strip** on page 27
- **Desktop Shortcuts** on page 30

**Note:** The bottom strip indicates which type of Actifio appliance you are logged into. A gray bottom strip indicates you are logged into an Actifio CDS appliance. An orange bottom strip indicates you are logged into an Actifio Sky or Actifio Sky for AWS appliance.
The Top Strip
As the name implies, the top strip is located at the top of the Actifio Desktop user interface:

![The Actifio Desktop Top Strip](image)

The following sections detail the buttons and controls on the top strip.

Desktop Menu
At the upper left of the Top Strip is a Desktop Menu that you can use to open a new Actifio Desktop or to quit all open Actifio Desktops:

![Desktop Menu](image)

Service Tabs
Each Actifio Desktop service provides a set of context-sensitive tabs across the top of its page.

![Service Tabs](image)

Hide, Close Actifio Desktop Services
As the names imply, these buttons hide or close the Actifio Desktop.

![Hide or Close Actifio Desktop](image)
The Navigation Panes

The Navigation Pane is a context sensitive menu that provides access to different workspaces within the selected Actifio service.

The Service Menus

The Service menu is a context-sensitive menu that allows you to perform system configurations, data management and data access operations.

The Bottom Strip

As the name implies, the bottom strip is located at the bottom of the Actifio Desktop user interface:

Note: The bottom strip indicates which type of Actifio appliance you are logged into. A gray bottom strip indicates you are logged into an Actifio CDS appliance. An orange bottom strip indicates you are logged into an Actifio Sky appliance.
The following sections detail the buttons and controls on the bottom strip.

**Service Menu and Refresh Display**
At the upper left of the Bottom Strip is the context-sensitive Service Menu button and a Refresh Display button:

Service Menu and Refresh Display Buttons

**Service Menu**: This context-sensitive button produces a menu above it of options relating to the service you are using. The Domain Manager Service Menu options are different from the options on the Application Manager Service Menu.

**Refresh Display**: Refreshes the active display pane.

**Lock Desktop, Software & Settings, and Shortcuts**
Immediately below the Service Menu and Refresh Display buttons are the Lock Desktop and System Settings buttons:

Lock Desktop, Software & Settings and Shortcuts Buttons

**Lock Desktop**: Use this button to lock the desktop. Re-authentication is required to continue working.

**Software & Settings**: Use this button to change your Desktop, User, and System settings as detailed in System Settings Tab on page 23. You can also verify the software version of the CDS cluster to which the Desktop is connected.

**Shortcuts**: Use this button to display the Shortcuts page. The Shortcuts page is made up of links to the more commonly used functions of the Actifio appliance.

**Services Buttons**
In the center of the Bottom Strip is the set of six buttons to the Actifio Desktop services, described in Actifio Desktop Services on page 31:

Services Buttons - Shown with Optional Report Manager
**Product Documentation**

At the far right of the Bottom Strip is an open-book icon that links to the comprehensive Actifio Documentation Library.

![Documentation Library Button](image)

Click the icon and the Actifio Documentation Library is displayed. Documents in the library provide detailed, step-by-step, application specific instructions on how to manage and access application data with your Actifio appliance.

---

**Welcome to the Actifio Documentation Library!**

This page provides links to your Actifio CDS and Sky appliance product documentation.

<table>
<thead>
<tr>
<th>Basics</th>
<th>Configuring Actifio Appliances</th>
<th>Managing Copy Data</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>What’s New in Actifio Desktop 7.07</td>
<td>Connecting Your Hosts to the Actifio Appliance</td>
<td>Using the Actifio Dashboard</td>
<td>The Most Common Error Codes</td>
</tr>
<tr>
<td>Getting Started with Actifio Copy Data Management</td>
<td>Setting Up Users and Roles in the Domain Manager</td>
<td>Visually Building and Protecting Copy Data with the Application Manager</td>
<td>Actifio Network Ports and Protocols</td>
</tr>
<tr>
<td>Administration Best Practices</td>
<td>Configuring Resources and Settings in the Domain Manager</td>
<td>Accessing and Recovering Copy Data with the Application Manager</td>
<td>Actifio Authentication to VMware vCenter Server</td>
</tr>
<tr>
<td>Continuity of Actifio Terms</td>
<td>Configuring Alerts and Notifications</td>
<td>Replicating Data Using Actifio Appliances</td>
<td>The Actifio Command-Line Reference</td>
</tr>
<tr>
<td>Additional Resources</td>
<td>Planning and Developing Service Level Agreements</td>
<td>Restoring Applications with the Application Manager</td>
<td>Using Workflows to Automate SQL Server Processes</td>
</tr>
<tr>
<td>Be sure to check the Actifio News portal for the most recent updates, and more!</td>
<td>Deploying the Report Manager</td>
<td>Using the Actifio Report Manager</td>
<td>Using Workflows to Automate Oracle Database Processes</td>
</tr>
<tr>
<td>Read the latest Actifio Desktop Release Notes and additional useful documentation online at the Actifio News portal.</td>
<td>Configuring Actifio Big Data Director (BDD)</td>
<td>Using the System Monitor to Monitor Jobs and Events</td>
<td>SQL Server DBA’s Guide to Actifio Copy Data Management</td>
</tr>
<tr>
<td>Download Library as a PDF file</td>
<td>Actifio Remote Support Options</td>
<td></td>
<td>Oracle DBA’s Guide to Actifio Copy Data Management</td>
</tr>
</tbody>
</table>
Desktop Shortcuts

In the lower left corner of the Actifio Desktop there’s a link to a handy Shortcuts page.

![Actifio Desktop Shortcuts](image)

The shortcuts are direct links to some commonly used features.

![The Shortcuts Page](image)

You can set the shortcuts as the default first page you see on startup from the Software and Settings dialog. See Setting Up Your Actifio Desktop on page 21 for details.
This chapter describes the services provided by the Actifio Desktop:

- **Actifio Desktop Service Icons** on page 32
- **The Actifio Desktop Dashboard** on page 33
- **The Domain Manager** on page 36
- **The SLA Architect** on page 38
- **The Application Manager** on page 40
- **The Report Manager** on page 42
- **The System Monitor** on page 43

Detailed step-by-step application specific instructions can be found in the Actifio Documentation Library and the Actifio Now customer portal. Pay particular attention to the documents in the **Configuring Actifio Appliances** and **Managing Copy Data** sections.
## Actifio Desktop Service Icons

Icons, representing the available Actifio Desktop services are displayed along the bottom of the Actifio Desktop window. Click a service icon to display that service in the Actifio user interface:

![Actifio Desktop Service Icons](image)

*Note: The bottom strip indicates which type of Actifio appliance you are logged into. A gray bottom strip indicates you are logged into an Actifio CDS appliance. An orange bottom strip indicates you are logged into an Actifio Sky or Actifio Sky for AWS appliance.*

<table>
<thead>
<tr>
<th>Button</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Button" /></td>
<td>The Actifio Desktop provides an overview of protected and unprotected applications, job history, and system health (disk usage, hardware, software, and events). For details, see <a href="#">The Actifio Desktop Dashboard</a> on page 33.</td>
</tr>
<tr>
<td><img src="image" alt="Button" /></td>
<td>The Domain Manager allows you to configure users, roles, usage levels of resource profiles, and discover application hosts and display host details. For details, see <a href="#">The Domain Manager</a> on page 36.</td>
</tr>
<tr>
<td><img src="image" alt="Button" /></td>
<td>The SLA Architect allows you to define policies, resource profiles, and service level agreements used in managing data. For details, see <a href="#">The SLA Architect</a> on page 38.</td>
</tr>
<tr>
<td><img src="image" alt="Button" /></td>
<td>The Application Manager allows you to discover applications and VMs, apply policies and resources, apply consistency group protection, and to access data. For details, see <a href="#">The Application Manager</a> on page 40.</td>
</tr>
<tr>
<td><img src="image" alt="Button" /></td>
<td>The optional Report Manager allows you to generate custom reports about your Actifio appliance. For details, see <a href="#">The Report Manager</a> on page 42.</td>
</tr>
<tr>
<td><img src="image" alt="Button" /></td>
<td>The System Monitor allows you to monitor an Actifio appliance in real-time. For details, see <a href="#">The System Monitor</a> on page 43.</td>
</tr>
</tbody>
</table>
The Actifio Desktop Dashboard

This section provides an overview of the Actifio Desktop Dashboard. For details on the Actifio Desktop Dashboard, see Using The Actifio Dashboard in the Actifio Documentation Library or in the Actifio Now customer portal.

By default, the Actifio Desktop Dashboard is the first screen you see when you log on to Actifio Desktop. To change the default setting see Desktop Settings Tab on page 34. The Dashboard provides a high-level view of the Actifio appliance. Click on any segment of the Dashboard to display a detailed view of that segment.

Applications

The Application section reports the number of applications:

- **Protected**: An application with an active SLA.
- **Unprotected**: An application that does not have an SLA associated with it.
- **Protection Disabled**: An application for which protection has been paused.

Job History

Job History includes an overview of current and recent jobs, job breakdown by type, and a display of job status history. Job data can be filtered from the filter icon in the upper right corner of the Dashboard.

To configure the Job History view, click the job history filter.
Job History Filter

From the Job History filter you can configure the timespan used to display job history as well as the applications included in the history.

Job History Filter View
Events (Last 24 Hrs)
The Events section displays the number of error and warning messages. Click on the number of events to view a detailed report of events.

System Health
The System Health section provides an overview of resource usage and system health in the right panel of the Dashboard:

- **Disk Usage**: Usage of all defined storage pools (Snapshot, Primary, and Dedup pools).
- **Hardware**: Status of storage resources and VDisk utilization.
- **Software**: Status of local snapshot, local dedup, and remote protection.
- **Image Preservation**: Status of all preserved snapshot images and preserved dedup images.
- **Dedup Stats**: Status of the load on the dedup engine.

Capacity
The Capacity section displays how much data is currently managed by the Actifio appliance.

Dedup
The Dedup section displays an overview of deduplication results for the Actifio appliance.
The Domain Manager

The Domain Manager provides two services:

- The **Security** section is for managing Organizations and Users that have access to the Actifio appliance, and the roles that you create and assign them.
- The **System** section is where you configure resources on which copy data resides, and identify hosts for protection.

For step-by-step instructions on configuring an Actifio appliance’s security settings, see *Setting Up Users and Roles With the Domain Manager* and *Configuring Event Alerting and Remote Support* in the Actifio Documentation Library.

For step-by-step instructions on configuring an Actifio appliance’s system settings, see *Configuring Resources and Settings With the Domain Manager* guide in the Actifio Documentation Library.

See *Features of the Actifio Desktop Domain Manager* on page 45 for high-level descriptions of configuring security and system settings.
Domain Manager’s Service Menu

The Domain Manager’s service menu is displayed by clicking the gear icon on the lower left-hand side of the page. The following table defines the Domain Manager’s service menu items:

<table>
<thead>
<tr>
<th>Use</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Organization...</td>
<td>Create a new organization and assign resources.</td>
</tr>
<tr>
<td>New User...</td>
<td>Create a new user and assign roles to the user.</td>
</tr>
<tr>
<td>New Role...</td>
<td>Create a new role, and assign rights to it.</td>
</tr>
<tr>
<td>New Host...</td>
<td>Configure a host to be protected.</td>
</tr>
<tr>
<td>Add New NAS Server</td>
<td>Add a Network Attached Storage (NAS) server to an Actifio appliance and discovers the datasets running on it to protect them.</td>
</tr>
<tr>
<td>Join Appliance...</td>
<td>Join two Actifio appliances for copy data replication.</td>
</tr>
<tr>
<td>Certificate Exchange</td>
<td>Exchange security certificates between two Actifio appliances.</td>
</tr>
<tr>
<td>Upload Certificate...</td>
<td>Upload the security certificate of a remote Actifio appliance that the Desktop is connected to. Uploading and downloading of security certificates results in the exchange of the certificates between two appliances. Consequently, you can replicate data to and from the remote appliances.</td>
</tr>
<tr>
<td>Download Certificate...</td>
<td>Download the security certificate of the Actifio appliance that the Desktop is connected to a local folder. Uploading and downloading of security certificates results in the exchange of the certificates between two appliances. Consequently, you can replicate data to and from the remote appliance.</td>
</tr>
<tr>
<td>Archive Job History...</td>
<td>Archive the history jobs of executed via the Actifio Desktop.</td>
</tr>
<tr>
<td>Add CLI Access</td>
<td>Add the SSH public key to enable CLI access for a user.</td>
</tr>
<tr>
<td>Delete</td>
<td>Delete a user, role, or host.</td>
</tr>
</tbody>
</table>
The SLA Architect

The SLA Architect is used to create Policy Templates for protection of your application data. Policy templates define when to protect data, how to protect data, where to replicate data, and how long to retain data.

Each Actifio appliance has its own set of predefined policy templates and rules around modifying and creating templates and their policies. See Policy Templates and Policies on page 6 for details.

For application specific, step-by-step instructions on using an Actifio appliance’s SLA Architect see Planning and Developing Service Level Agreements in the Actifio Documentation Library or the Actifio Now customer portal.
**SLA Architect’s Service Menu**

The SLA Architect’s service menu is displayed by clicking the gear icon on the lower left-hand side of the page. The following table defines the SLA Architect’s service menu items:

<table>
<thead>
<tr>
<th>Use</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Template...</td>
<td>Create a template. A template defines a service-level agreement and includes one or more policies, a schedule to run each policy, and exceptions to the schedule.</td>
</tr>
<tr>
<td>New Profile</td>
<td>Configure a resource profile. A resource profile defines the storage for snapshot or deduplicated or replicated images of data from protected applications.</td>
</tr>
<tr>
<td>Import Templates</td>
<td>Import templates from an Actifio appliance.</td>
</tr>
<tr>
<td>Export Templates...</td>
<td>Save all the templates of an Actifio appliance as a file to import to another appliance.</td>
</tr>
<tr>
<td>Clone</td>
<td>Clone a template or resource profile.</td>
</tr>
<tr>
<td>Delete</td>
<td>Delete a template or resource profile.</td>
</tr>
</tbody>
</table>
The Application Manager

The Application Manager is used to discover applications and VMs and to apply protection templates and resource profiles to the discovered applications and VMs and to access application data.

For application specific, step-by-step instructions on using an Actifio appliance’s Application Manager see the following guides in the Actifio Documentation Library:

- Virtualizing and Protecting Copy Data with the Application Manager
- Accessing and Recovering Copy Data with the Application Manager
- Replicating Data Using Actifio Appliances
- Restoring Copy Data with the Application Manager
- Creating Automated Workflows for SQL Server Databases and Creating Automated Workflows for Oracle Databases
**Application Manager’s Service Menu**

The Application Manager’s service menu is displayed by clicking the gear icon on the lower left-hand side of the page.

The following table defines the Application Manager’s service menu items:

<table>
<thead>
<tr>
<th>Use</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show Jobs</td>
<td>Display all jobs in the System Monitor.</td>
</tr>
<tr>
<td>Discover App(s)...</td>
<td>Find an application on a host. The Actifio Connector enables Actifio appliances to find file systems, applications and VMs.</td>
</tr>
<tr>
<td>Discover VM(s)...</td>
<td>Find VMs managed by a selected hypervisor host.</td>
</tr>
<tr>
<td>New Application...</td>
<td>Create a generic application on a host where the Actifio Connector is not installed.</td>
</tr>
<tr>
<td>Set Application Type</td>
<td>Allow you to manually set the application type for a discovered application.</td>
</tr>
<tr>
<td>New NAS Dataset</td>
<td>Create a NAS dataset from an Isilon NAS server.</td>
</tr>
<tr>
<td>New Consistency Grp</td>
<td>Creates a group to protect the consistency of data across member applications. All member applications of a consistency group must reside on the same host. A consistency group cannot be a member of another consistency group.</td>
</tr>
<tr>
<td>New Group</td>
<td>Create a group of applications. Create this group when you want to protect several applications with a single SLA. Member applications residing on various hosts can be grouped together.</td>
</tr>
<tr>
<td>Manage VDisk(s)</td>
<td>Assign virtual disks to an existing generic application.</td>
</tr>
<tr>
<td>Modify Expiration</td>
<td>Change the expiration date for captured images within a date range for the selected application.</td>
</tr>
<tr>
<td>Expire All Backups...</td>
<td>Expire all the captured images for the selected application, file system, group, or consistency group.</td>
</tr>
<tr>
<td>Mark Ignored</td>
<td>Ignore an application when computing the dashboard statistics.</td>
</tr>
<tr>
<td>Unmark Ignored</td>
<td>Reverse the Mark Ignored option.</td>
</tr>
<tr>
<td>Delete</td>
<td>Delete an application, group, or a consistency group.</td>
</tr>
<tr>
<td>Mark Sensitive</td>
<td>Mark a selected application, VM or group as sensitive and available to only those users who have access to sensitive data. Access to sensitive data is defined for users in the Security section of the Domain Manager service.</td>
</tr>
<tr>
<td>Cleanup Dedup Async.</td>
<td>Clean up artifacts from Dedup-Async related operations. This only appears when there are images to be cleaned up. The Cleanup Dedup Async function is supported only by the Actifio CDS appliance.</td>
</tr>
</tbody>
</table>
The Report Manager

*Note: The Actifio Report Manager is not available in Actifio Sky for AWS.*

The optional Report Manager is used to report on your data protection and recovery operations. For application specific, step-by-step instructions on using an Actifio appliance’s Report Manager see [Deploying the Report Manager](#) and [Using the Report Manager](#) in the Actifio Documentation Library or the Actifio Now customer portal.
The System Monitor

The System Monitor is used to monitor jobs and events. The System Monitor has no service menus; all System Monitor functions are reached from the Jobs and Events tabs at the top of the page, as filtered from the Navigation Pane. For application specific, step-by-step instructions on using an Actifio appliance’s System Monitor see Using the System Monitor to Monitor Jobs and Events in the Actifio Documentation Library or the Actifio Now customer portal.

By default, the System Monitor displays all types of jobs running and errors raised during the last 24 hours. The navigation pane allows you to filter jobs by date, status, and type.

Click the Events tab to see events according to date, status and type. You can select multiple filter values by holding the Shift key.

Click the Jobs tab to see jobs.

- **Change Priority** allows you to change the priority of a job. You can change the priority of jobs based on how you want the Actifio appliance to allocate necessary resources.
- **View Details** shows you the details of the job.
- **Cancel Job** allows you to cancel a running job.
This chapter presents a high-level description of the Domain Manager service’s Security and System settings:

Security Settings on page 45
Domain Manager System Settings on page 49

For step-by-step instructions on configuring an Actifio appliance’s security settings, see Setting Up Users and Roles With the Domain Manager guide in the Actifio Documentation Library.

For step-by-step instructions on configuring an Actifio appliance’s system settings, see Configuring Resources and Settings with the Domain Manager guide in the Actifio Documentation Library.

Once an Actifio appliance is installed, your Actifio representative will work with you to configure the Domain Manager service’s security and system-level settings.

Security Settings

The Domain Manager Security Settings allows you to define users, the roles they fill, and the organizations to which they belong. To define security settings, from the Domain Manager service’s left-hand navigation pane, under Security, select either: Users, Roles, or Organizations.

For example, with the User, Role and Organization settings, you can create:

- **Protection Architects:** The Protection Architects design and implement all protection solutions. They have full access to all Actifio appliance functions and features.

- **General Protection Administrators:** The Protection Administrators can execute all protection and recovery operations and view all settings and reports but do not have access to; SLA Architect functionality that defines protection and Domain Manager functionality that defines users, roles and organizations.

- **Oracle Protection Administrators:** The Oracle Protection Administrators can execute protection and recovery operations for object that belong to the Oracle organization.

- **Protection Viewers:** Protection Viewers can view all Actifio appliance settings and reports but cannot create, modify or execute protection or recovery operations.
Organizations

The Organizations section allows you to group managed objects into Organizations. Organizations are used to limit user access to specific managed objects. To manage an object, users, regardless of their role, must belong to the same organization as the object.

- The Organization Details tab allows you to define the high-level settings for an organization.
- The Organization Ownership tab allows you to view all users and resources that are members of the organization.

Domain Manager Organization Details Tab
Roles

The Roles section allows you to define roles that define access rights. Access can be granted for an entire Actifio Desktop service or more granularly by selecting detailed access control levels. The Role Details tab provides high-level information about the role. The Role Rights tab allows you to assign access rights to an Actifio appliances services and operations.
Users

The Users section allows you to create the user names and passwords to control access an Actifio appliance. Once a user is created, use the Roles and Orgs tabs to assigned a role and an organization to the user.
Domain Manager System Settings

System settings are usually configured by an Actifio representative during the initial installation and configuration of an Actifio appliance. System settings consist of:

- Domain Manager Configuration Settings on page 49
- Domain Manager Actifio Big Data Director (BDD) on page 56
- Domain Manager NAS Servers on page 56
- Domain Manager Hosts on page 57
- Domain Manager Images on page 58
- Domain Manager Diagnostics on page 60
- Domain Manager Software Upgrade on page 62

Domain Manager Configuration Settings

Configuration settings, as the name implies, allow you to configure your Actifio appliance and consist of the following settings.

- Domain Manager Resources on page 49
- Domain Manager Storage Pools on page 50
- Domain Manager Dedup Settings on page 51
- Domain Manager Appliance Settings on page 52
- Domain Manager Connector Management on page 53
- Domain Manager Notifications on page 54
- Domain Manager Logs on page 55

Domain Manager Resources

The Resource settings allow you to view storage consumption, and to set their limits and warning thresholds.
**Domain Manager Storage Pools**

The Storage Pool settings are used to view storage pool consumption, to set their limits and warning thresholds and to create pools.

Your Actifio representative, based on your data management requirements will create the initial local and remote Snapshot Pools and Dedup Pools. In the future, if needed, you can use this feature to create additional Snapshot Pools.

OnVault storage pools define storage for Actifio Snapshot to OnVault Policies. They are meant for long-term storage of data.
Domain Manager Dedup Settings

The Dedup Setting’s Garbage Collection purges expired data. When an image is expired, the space occupied by expired data is not immediately reclaimed. The garbage collection tool identifies (and later reclaims) space occupied by the expired data.

The more often Garbage Collection is run, the less time subsequent Garbage Collection operations require. Garbage Collection is a CPU intensive operation and must be carefully planned. Garbage Collection is set by your Actifio representative during initial set up of the Actifio appliance. Because these settings can impact overall system performance, contact your Actifio representative before making changes to Garbage Collection settings.
Domain Manager Appliance Settings

The appliance settings option displays other Actifio appliances to which the current appliance is joined. When sites are joined, they can act as each other’s disaster recovery site.

Joining appliances involves the exchange of certificates. Certificates are uploaded, downloaded or exchanged via the Domain Manager’s service menu. Your Actifio representative will join local and remote sites during the initial set up.

From the Appliance Settings option you can also:

- View certificates
- Throttle replication bandwidth
- Define a datastore as the target for VMware VM replication
- Enter LDAP settings
- Shutdown the appliance
- Enable policy management
- Enable remote problem resolution
Domain Manager Connector Management

During the initial set up of the Actifio appliance, your Actifio representative will install the Actifio Connector on the physical servers and virtual servers as needed. Going forward, use the connector management tool to view the status of the connectors installed in your environment and to update the Actifio Connector software as needed.
Domain Manager Notifications

The Notifications tool is used to send email notifications of events to users.
**Domain Manager Logs**

The Logs tool is used to send Actifio appliance statistics and logs to users and the Actifio support team.
Domain Manager Actifio Big Data Director (BDD)

The optional Actifio Big Data Director (BDD) is a 2U rack-mountable hardware addition for your Actifio CDS appliance that turns the appliance into an efficient platform for reliably capturing, archiving, replicating, and recovering a variety of unstructured data from large file systems. Each BDD Node provides the necessary CPU, memory, and network bandwidth for the Actifio CDS appliance to capture and export NAS file-level data, and to dedup this data. The Actifio CDS appliance supports network connectivity with up to eight BDD Nodes.

**Note:** See Configuring Actifio Big Data Director (BDD) for instructions on how to configure and use Actifio’s Big Data Director (BDD).

Domain Manager NAS Servers

NAS datasets are sets of data from Isilon NAS servers that are virtualized by the Actifio appliance and stored on an Actifio BDD node.

**Note:** NAS datasets, NAS servers, and the Actifio BDD node are not applicable to Actifio Sky.

You protect a NAS dataset by binding a resource profile and a template to it to make an SLA.
Domain Manager Hosts

Before you can protect an application’s data, you must first add its host to an Actifio appliance. Once a host is added, use the tabs across the top of the Domain Manager service to specify the host’s ports and virtual disks.

Hypervisors are considered hosts and added here as well. Individual VMs on a hypervisor are discovered via the Application Manager service.

*Note: The Actifio appliance supports multiple hosts with the same Host Name.*
Domain Manager Images

Domain Manager Images provides two tools:

Mounted/Unmounted Tool on page 58
Preserved/Discarded Tool on page 59

Mounted/Unmounted Tool

The Mounted/Unmounted tool allows you to access mounted images. Active images are mounted copies of captured images. Mounting a captured image presents a copy of the image to a host. When you are finished with an Active Image, you can unmount or delete the image.
Preserved/Discarded Tool

The Preserved/Discarded tool lets you view a list of preserved and discarded images:

- From the Preserved Images window you can:
  - View a Preserved Images history to see how many snapshot and dedup images were preserved over a period of a week or a month.
  - Select a single snapshot or dedup image and access this image in the Restore window of the Application Manager.
  - Expire a single image or multiple preserved images.

![Preserved Images](image)

- From the Discarded Images window you can see a summary of images that have been expired without processing over the past day, week, or month.

![Discarded Images](image)
Domain Manager Diagnostics

The Diagnostics tools supports the following:

- The Actifio appliance includes a suite of diagnostic charts to help you keep your Actifio appliance running efficiently. Information from the diagnostic charts can help you to plan changes to your Actifio appliance and to identify problems and potential problems with your appliance.

- The System Load window displays statistics related to the system-related load on the dedup engine in your Actifio appliance.

Charts Example: Dedup - System Load Graph
System Load Window and Associated Dedup Engine Statistics
Domain Manager Software Upgrade

The Software Upgrade tool allows the upgrading of the Actifio CDS or Sky appliance software patch or service pack directly from the Desktop. You can use the Upload & Install page to upload a service pack to this Actifio appliance. You can enable automatic software uploads by enabling Actifio SecureConnect as described in System Settings Tab on page 23.

**Note:** Use the Upload & Install page to perform a software upgrade only under the direction of Actifio Support.
Capturing Applications Overview

This chapter presents high-level descriptions of the processes used to capture an application:

- Adding Hosts on page 64
- Discovering Applications and VMs on page 65
- Creating Policy Templates on page 66
- Creating Policies on page 68
- Resource Profiles on page 73
- Applying Policy Templates and Resource Profiles on page 74

Detailed, application-specific instructions on how to capture an application can be found in the Actifio Documentation Library:

1. Add hosts that host applications using the Domain Manager service. For detailed, application-specific instructions see the Connecting Hosts to Actifio Appliances guide in the Actifio Documentation Library or the Actifio Now customer portal.

2. Create Actifio appliance policy templates and resource profiles using the SLA Architect service. Policies and templates define when and where to capture data and how long to keep it. For detailed, application-specific instructions see the Planning and Developing Service Level Agreements guide in the Actifio Documentation Library or the Actifio Now customer portal.

3. Discover applications and VMs using the Application Manager service. For detailed, application-specific instructions see the Virtualizing and Protecting Copy Data with the Application Manager guide in the Actifio Documentation Library or the Actifio Now customer portal.

4. Assign an Actifio Policy Template and resource profile to an application using the Application Manager service. For detailed, application-specific instructions see the Virtualizing and Protecting Copy Data with the Application Manager guide in the Actifio Documentation Library or the Actifio Now customer portal.
Adding Hosts

The first step in capturing an application is to add the host on which the application(s) reside. To add a host, open the Domain Manager service and click the service menu icon:

![Domain Manager's Service Menu](image)

From the service menu, select **New Host**. A page is displayed that allows you to define the host to be captured.

![Add New Host](image)

From this page you can add servers that host applications and hypervisors that host VMs. Individual VMs are discovered via the Application Manager service.

**Note:** Adding VMs does not apply to Actifio Sky for AWS.
Discovering Applications and VMs

After a host is added, use the Application Manager service to discover applications on physical servers, VMs on hypervisors, and applications on VMs.

**Note:** Discovering VMs does not apply to Actifio Sky for AWS.

From the Application Manager’s Navigation Pane, select a discovered physical server, hypervisor, or VM. From the Application Manager’s service menu, select either Discover APP(s) or Discover VM(s):

**Application Manager’s Service Menu**

When you select Discover APP(S) or Discover VM(s), you are prompted to select which of the discovered hosts or hypervisors you want to discover applications or VMs.

**Select Discovered Applications**
Creating Policy Templates

Policy templates are made up of one or more policies. Policy templates provide a high-level wrapper for an end-to-end definition of capturing application data. For example, if you need to capture an image as a local snapshot and replicate that image off to another Actifio appliance, the policy template will contain both the local snapshot and remote off site policies.

**Note:** See *Planning and Developing Service Level Agreements* in the Actifio Documentation Library for detailed best practices for configuring policies in Policy Templates.

To create a new template:

1. From the SLA Architect service menu, click **New Template**...
The New Template page is displayed:

![New Template Page with Policy Settings Shown](image)

2. The default name of the template is New Template. Click the New Template name above the Created on Date and rename the template as needed.

3. The policy settings allow the application-specific Advanced Settings parameters that have been defined for the individual applications in the Application Manager to override the Advanced Settings defined in the SLA template’s policies.

Once the policy template is created, create the individual policies that comprise the SLA template.
Creating Policies

Policies define how often to capture an application, how long to retain the captured application and when applicable, where and how to replicate the captured application’s data.

The green arrows in the SLA Architect represent the policies within a template that control data flow to the various pools.

A Policy allows you define whether its schedule will run:

- **Within a Window** - A period of time in which jobs are allowed to start.
- **Continuous** - Defines when its first job can start but as the name implies, allows subsequent jobs to run at a frequency without regard to any time boundary.

Where applicable, SLA Template Policies allow you to define the rules for determining whether or not a data protected by a policy meets your requirements. The Actifio appliance automatically calculates and sets default SLA Compliance settings. Default settings are based on whether the policy is set to windowed or continuous, the policy type, and Actifio-recommended best practices. The default settings calculated will meet the needs of most users.

If data is being protected according to your needs, then it is considered to be in compliance.

The SLA Templates are made up of the following types of policies:

- **Production to Snapshot Policies** on page 69
- **Snapshot to Dedup Backup Policies** on page 69
- **Dedup Backup to Dedup DR Policies** on page 70
- **Snapshot to OnVault Policies** on page 70
- **Production to Mirror Policies** on page 71
- **Production Direct to Dedup Policies** on page 72

*Note: See Planning and Developing Service Level Agreements in the Actifio Documentation Library for detailed best practices for configuring policies an SLA template.*
Production to Snapshot Policies

Production to Snapshot policies define when and how often data will be written to the Snapshot Pool and how long that data will be retained.

In addition, application-specific advanced settings can be applied to the policy. If the template in which this policy resides allows overrides. When you apply a policy template to an application in the Application Manager service, you will be given the opportunity to override the advanced settings defined in this policy.

To create a Production to Snapshot policy:

1. Select a template from the left-hand Policy Template list.
2. Click the green arrow between Production and Snapshot. The policy window appears.
3. Click the + (Plus) icon and the policy settings are displayed.
4. Specify the schedule type for the policy: Windowed or Continuous. The default is Windowed.
5. Enter policy schedule and retention settings that meet your RTOs and RPOs.
6. Set Configure SLA compliance settings. In most cases, the default settings will meet your needs.
7. Set the advanced settings that apply to the application you are capturing.
8. Save the settings.

Snapshot to Dedup Backup Policies

Snapshot to Dedup Backup policies define when data from the Snapshot Pool will be deduplicated and how long the deduplicated data will be retained in the Local Dedup pool.

To create a Snapshot to Dedup Backup policy:

1. Select a template from the left-hand Policy Template list.
2. Click the green arrow between Snapshot and Dedup Backup. The policy window appears.
3. Click the + (Plus) icon and the policy settings are displayed.
4. Specify the schedule type for the policy: Windowed or Continuous. The default is Windowed.
5. Enter policy settings that meet your RPOs and RTOs.
6. Set **Configure SLA compliance settings**. In most cases, the default settings will meet your needs.
7. Save the settings.

**Dedup Backup to Dedup DR Policies**

The Dedup Backup to Dedup DR policy defines when deduplicated data from the Local Dedup pool will be replicated to a Local Dedup pool on a remote site. It also defines how long the replicated data will be kept on the remote site.

If no other policies are defined in the template, then this policy can be used as the second hop in a multi-hop replication scheme.

To create a Dedup Backup to Dedup DR policy:

1. Select a template from the left-hand Policy Template list.
2. Click the green arrow between **Dedup Backup** and **Dedup DR**. The policy window appears.
3. Click the **+(Plus)** icon and the policy settings are displayed.

4. Specify the schedule type for the policy: Windowed or Continuous. The default is Windowed.
5. Enter policy settings that meet the requirements of your RPOs and RTOs.
6. Set **Configure SLA compliance settings**. In most cases, the default settings will meet your needs.
7. Save the settings.

**Snapshot to OnVault Policies**

The Snapshot to OnVault policy defines when Production to Snapshot data will be replicated to an Actifio OnVault Pool. It also defines how long the replicated data will be kept in an Actifio OnVault Pool.

To create a Snapshot to OnVault Policy:

1. Select a template from the left-hand Policy Template list.

   **Note:** For new policy templates, you must first create a Production to Snapshot Policy. Once the Production to Snapshot Policy is created, the “green arrow” between the snapshot and Actifio OnVault will be activated.

2. Click the green arrow between **Snapshot** and **OnVault**. The policy window appears.
3. Click the **+(Plus)** icon and the policy settings are displayed.
4. Enter policy settings that meet the requirements of your RPOs and RTOs.
5. Save the settings.

Production to Mirror Policies

The Production to Mirror policy defines how data will be replicated to a Snapshot Pool on a remote site (Dedup-Async, StreamSnap, Sync, or Async) and how often replication should occur.

**Note:** Sync and Async replication does not apply to Actifio Sky or Actifio Sky for AWS appliances.

In addition, application specific advanced settings can be applied to the policy. If the template in which this policy resides allows overrides: When you apply a policy template to an application in the Application Manager, you will be given the opportunity to override the advanced settings defined in this policy.

To create a Production to Mirror policy:

1. Select a template from the left-hand Policy Template list.
2. Click the green arrow between Local Production and Remote Mirror. The policy window appears.
3. Click the **(Plus)** icon and the policy settings are displayed.

4. Select the replication type (for example, Dedup-Async or StreamSnap).
5. Enter policy settings that meet your off site RPOs and RTOs.
6. Save the settings.
Production Direct to Dedup Policies

Production Direct to Dedup policies are used to capture VMware VMs directly to a dedup pool. They define when to deduplicate VMware VMs and how long to retain the deduplicated data. VMware VMs can be deduplicated directly because the Actifio appliance can get changed-block information directly from VMware APIs.

In addition, VMware specific advanced settings can be applied to the policy. If the template in which this policy resides allows overrides, then when you apply a policy template to an application in the Application Manager, you will be given the opportunity to override the advanced settings defined in this policy.

To create a Production Direct to Dedup policy:

1. Create a new policy template.
2. Click the green arrow that points from Production to Dedup Backup. The policy window appears.
3. Click the + (Plus) icon and the policy settings are displayed.
4. Specify the schedule type for the policy: Windowed or Continuous. The default is Windowed.
5. Enter policy settings that meet the requirements of your RPOs and RTOs.
6. Set Configure SLA compliance settings. In most cases, the default settings will meet your needs.
7. Save the settings.
Resource Profiles

A resource profile specifies where data will be backed up and the Snapshot Pool to be used. If you will replicate data in the Snapshot Pool to a Mirror Pool (Snapshot Pool) on a remote site, you will need to select the remote site from the Remote drop down list. Only those remote sites that have exchanged certificates with and joined the local site will be listed in the Remote drop down list.

To create a resource profile:

1. From the SLA Architect user interface’s service menu, click **New Profile**...

![New Profile page](image)

The New Profile page is displayed:

2. Select the local Actifio appliance from **Local** drop-down list. This is the appliance on which the profile is created.
3. When applicable, select the remote Actifio appliance from the **Remote** drop-down list.
4. Select the Snapshot pool from the **Disk Pool** drop-down list.
5. When applicable, select an Actifio OnVault Pool to which data will be sent. You can select this option only if this Actifio appliance has defined an OnVault Storage Pool. See **Configuring Resources and Settings With the Domain Manager** for details.
6. Click **Save**.
Applying Policy Templates and Resource Profiles

After defining at least one policy template and one resource profile, use the Application Manager service to apply them to an application or VM.

To apply a policy template and a resource profile to an application or a VM:
1. Open the Application Manager.

2. Select APP or VM from the Navigation Pane.
3. Select Unprotected from the Filter Pane and all unprotected (not captured) applications or VMs are displayed in the Navigation Pane.
4. Select the application or VM to capture.
5. Select a policy template from the Template drop-down list.
6. Select a Resource Profile from Profile drop-down list.
7. After applying a policy template and a resource profile, click Advanced Settings and the Advanced Settings dialog box is displayed. Advanced settings are specific to each application. If Allow Override is set Yes on the template assigned to this application, then the settings in the application’s Advanced Settings dialog box will be applied.

Advanced Settings for specific applications are described in the Virtualizing and Protecting Copy Data with the Application Manager guide in the Actifio Documentation Library or the Actifio Now customer portal.
8  Accessing Data

This chapter describes the various ways in which you can access your captured data:

- **Mounts** on page 75
- **Clones** on page 76
- **LiveClones** on page 76
- **Workflows** on page 76
- **Restores** on page 76

For detailed, application-specific, step-by-step instructions on how to access data, refer to the following guides in the Actifio Documentation Library or the Actifio Now customer portal.

- **Accessing and Recovering Copy Data with the Application Manager**
- **Replicating Data Using Actifio Appliances**
- **Restoring Copy Data with the Application Manager**
- **Creating Automated Workflows for SQL Server Databases** and **Creating Automated Workflows for Oracle Databases**

### Mounts

The Actifio mount function provides instant access to data without moving data. There are two options for mounting data:

- **Application aware mounts** allow you to mount captured Microsoft® SQL and Oracle databases as virtual applications. This allows you to quickly bring a database on line without having to actually move the data and without having to manually configure a new instance of the database.

  Application aware mounts are particularly useful in test and development environments where multiple copies of a database must be quickly brought online.

  Data presented as an application aware mount can be captured like any other application. Once the application aware mounted application data is captured, it too can be mounted as an application aware mount.

  The capture, application mount, capture sequence can be repeated to any depth. By default, the sequence is restricted to five generations of the original database.

- **The standard mount** presents and makes application data available to a target server as a file system, not as an application. This is useful if an application is corrupt, lost, or if an application server is being replaced. In such cases you can mount an image and copy the application files from the mounted image to their original location on the application server.

> **Note:** Actifio Sky appliances can use a standard mount to access data that resides in an Actifio Vault. Actifio CDS appliances **cannot** use a standard mount to access data that resides in an Actifio Vault.
Clones

Use the clone function to create an independent copy of a data set. The most common uses are: application development and testing, data audit for compliance, data warehousing, e-discovery, and user acceptance testing. Physical server or VM application-consistent data sets can be copied to a separate storage location anywhere in your environment. Like any other VM, a VM clone can be migrated to a new storage location.

LiveClones

The LiveClone is similar to the Clone function, however, unlike a Clone, a LiveClone can be updated on demand or according to a schedule. When an updated copy of the data is available, a LiveClone allows an independent copy of a data to be mounted. This allows teams such as development and test to ensure they are working on the latest set of data without having to manually manage the data.

Workflows

Within the context of an Actifio appliance, a Workflow refers to the automation of access to copy data in a scheduled or prescribed fashion. While SLA Policy Templates govern the automated capture of production data and its management as copy data within the Virtual Data Pipeline, Workflows automate the access to this data.

Steps are defined within a Workflow to perform a series of tasks on a schedule or on demand. This includes creating and refreshing LiveClones, data masking, persistent mounts, and non-persistent processing mounts for tasks such as tape-out, database integrity checks, and ETL loads. Workflows are also used by administrators to provide simplified and secured self-service data access to end users such as database administrators and application developers.

For details on Workflows, see Creating Automated Workflows for SQL Server Databases and Creating Automated Workflows for Oracle Databases.

The following image provides a high-level description of a Workflow that creates a LiveClone from production data, then scrubs the LiveClone of sensitive information, before mounting the LiveClone to a work environment.

Restores

The Restore function reverts the 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 an application 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.
# Glossary of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>Actifio CDS™</td>
<td>Actifio Copy Data Storage is the technology on which the company’s unique copy data virtualization is built. See CDS node.</td>
</tr>
<tr>
<td>Actifio Connector</td>
<td>An Actifio Connector is a lightweight service that may be run on physical or virtual appliances. It discovers and captures individual applications virtual and physical machines and servers so they can be replicated.</td>
</tr>
<tr>
<td>Actifio Desktop</td>
<td>Actifio Desktop software controls the configuration and operation of physical and virtual Actifio appliances.</td>
</tr>
<tr>
<td>Actifio Global Manager</td>
<td>The Actifio Global Manager (AGM) provides a web-based interface to manage multiple Actifio CDS and Actifio Sky appliances, including day-to-day copy data operations.</td>
</tr>
<tr>
<td>Actifio Sky for AWS</td>
<td>Actifio Sky for AWS is a version of Actifio Sky software that creates and manages a virtual Actifio appliance in an Amazon AWS cloud space.</td>
</tr>
<tr>
<td>Actifio Sky™</td>
<td>Actifio Sky is a cloud technology that creates and manages virtual Actifio appliances.</td>
</tr>
<tr>
<td>AGM</td>
<td>Actifio Global Manager.</td>
</tr>
<tr>
<td>App or Application</td>
<td>An app or application is a data resource that can be discovered and protected by an Actifio appliance. Examples include Oracle or SQL databases, Exchange databases, network or local file systems or parts of file systems, virtual or physical machines, and so on.</td>
</tr>
<tr>
<td>Appliance</td>
<td>An “appliance” is the generic term for either an Actifio physical or virtual server. Physical Actifio appliances are made up of two Actifio CDS nodes, a primary and a secondary and optional storage and fibre channel switches. Virtual Actifio appliances are referred to as Actifio Sky appliances.</td>
</tr>
<tr>
<td>Application Manager</td>
<td>The Application Manager is software used to discover applications, application data, and virtual machines, and to apply protection templates and resource profiles them.</td>
</tr>
<tr>
<td>Async Replication</td>
<td>Asynchronous replication is one of the types of replication used by an Actifio appliance. Sync Replication is highly reliable and supports replication between Actifio appliances that are no more than 300KM apart. Also see Sync Replication, Dedup Async™ Replication (DAR), and Dedup Backup Replication.</td>
</tr>
<tr>
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<tr>
<td><strong>B</strong></td>
<td><strong>Baseboard System Identification</strong>&lt;br&gt;The base board system identifier (BBSID) is an arbitrary unique number that becomes part of a unique suffix for a node’s World Wide Node Number and World Wide Port Number. These both must be unique within a fabric.&lt;br&gt;&lt;br&gt;The BBSID is also used by Actifio to generate a unique ID for Actifio SecureConnect access and to generate secure shell keys to access a system for troubleshooting.</td>
</tr>
<tr>
<td><strong>BBSID</strong></td>
<td><strong>Baseboard System Identification</strong></td>
</tr>
<tr>
<td><strong>BDD</strong></td>
<td>See Big Data Director.</td>
</tr>
<tr>
<td><strong>Big Data Director</strong></td>
<td>Big Data Director (BDD) is a hardware and software product that creates an efficient platform to reliably capture, archive, replicate, and recover petabyte-sized unstructured datasets from large file systems.</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td><strong>CBT</strong>&lt;br&gt;Changed Block Tracking.</td>
</tr>
<tr>
<td><strong>CDS</strong></td>
<td>See Actifio CDS™.</td>
</tr>
<tr>
<td><strong>CDS node</strong></td>
<td>A Copy Data Storage (CDS) node is one of a pair of servers (a primary and a secondary) running CDS software that makes up a physical appliance.</td>
</tr>
<tr>
<td><strong>Changed Block Tracking</strong></td>
<td>Changed block tracking is the process of comparing the golden snapshot to incremental point in time snapshots in order to identify changed data that must be preserved.</td>
</tr>
<tr>
<td><strong>CLI</strong></td>
<td>Command line interface.</td>
</tr>
<tr>
<td><strong>Clone</strong></td>
<td>The clone function creates an independent copy of a data set. A virtual server or physical server data set can be copied from any application-consistent point in the system to a separate storage location anywhere in the environment.</td>
</tr>
<tr>
<td><strong>Clone VDisks</strong></td>
<td>Clone VDisks, are the part of a Snapshot pool that contains full copies of an application’s production data.</td>
</tr>
<tr>
<td><strong>Connector</strong></td>
<td>See Actifio Connector.</td>
</tr>
<tr>
<td><strong>Consistency Group</strong></td>
<td>A group of storage resources protected as a single entity by an Actifio appliance.</td>
</tr>
<tr>
<td><strong>Copy Data Virtualization</strong></td>
<td>Copy Data Virtualization is the Actifio data management model — capture data and process it in a virtual data pipeline to create a single golden master copy that is incrementally updated according to a service level agreement (SLA) and is used to generate a virtual copy of any application data from any point in time for any authorized use.</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td><strong>DAR</strong>&lt;br&gt;See Dedup Async™ Replication (DAR).</td>
</tr>
<tr>
<td><strong>Dedup</strong></td>
<td>Deduplication is a storage technology and a process that reduces the amount of storage space consumed by data by removing redundant data.</td>
</tr>
<tr>
<td><strong>Dedup Async™ Replication (DAR)</strong></td>
<td>Dedup Async Replication is a unique, proprietary Actifio technology that keeps a remote copy of production data always up-to-date and ready for data recovery. Also see Async Replication, Dedup Backup Replication, and Sync Replication.</td>
</tr>
<tr>
<td><strong>Dedup Backup Replication</strong></td>
<td>An Actifio proprietary deduplication-aware replication protocol used for replication of captured images from one Actifio appliance to a second and optionally to a third for long-term storage. Also see Async Replication, Sync Replication, and Dedup Async™ Replication (DAR).</td>
</tr>
<tr>
<td><strong>Domain Manager</strong></td>
<td>The Domain Manager software controls the organizations and users that have access to an Actifio appliance, identify hosts that Actifio can protect, and manages the resources on which copy data resides.</td>
</tr>
<tr>
<td>Term</td>
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</tr>
<tr>
<td>Enumeration</td>
<td>Enumeration is the first phase Garbage Collection. Enumeration analyzes the catalog of deduplicated data to determine what data must be kept and what can be deleted. It is the first phase of Garbage Collection and is followed by Sweep.</td>
</tr>
<tr>
<td>Failback</td>
<td>Failback is the recovery process used when a primary system or data is restored to operation after a Failover. Also see Syncback.</td>
</tr>
<tr>
<td>Failover</td>
<td>The process of using a secondary system, usually hardware, to replace a primary system that fails during operation. Also used to describe the data copied when a failover occurs. See Failback and Syncback.</td>
</tr>
<tr>
<td>Fibre Channel</td>
<td>Fibre channel is a high-speed network technology commonly running at 2, 4, 8 or 16-gigabit per second that is used primarily to connect data storage devices.</td>
</tr>
<tr>
<td>Filter Driver</td>
<td>The mechanism used by the Actifio Connector for Changed Block Tracking.</td>
</tr>
<tr>
<td>Garbage Collection</td>
<td>Garbage collection is the two-phase process of reclaiming space in the dedup pool. Enumeration, the first phase, is the selection of data that can be deleted. Sweep is the removal of the unneeded data.</td>
</tr>
<tr>
<td>GC</td>
<td>See Garbage Collection.</td>
</tr>
<tr>
<td>Host</td>
<td>A server with managed or manageable applications.</td>
</tr>
<tr>
<td>Hyper-V</td>
<td>Microsoft’s virtual machine platform is a native hypervisor that can create virtual machines on x86-64 systems.</td>
</tr>
<tr>
<td>IGC</td>
<td>Incremental Garbage Collection was deprecated in Actifio CDS/Sky 7.0</td>
</tr>
<tr>
<td>In-Band</td>
<td>In-band is a network architecture describing protected applications that are connected directly to Actifio storage. See also Out-of-Band and LAN-Free.</td>
</tr>
<tr>
<td>iSCSI</td>
<td>The Internet Small Computer System Interface works on top of the Transport Control Protocol (TCP) and allows the SCSI command to be sent end-to-end over local-area networks (LANs), wide-area networks (WANs) or the Internet.</td>
</tr>
<tr>
<td>LAN-Free</td>
<td>LAN-free is a network architecture in which application data is protected using a shared, central storage device without sending the data over the local area network (LAN). See also In-Band and Out-of-Band.</td>
</tr>
<tr>
<td>LiveClone</td>
<td>An independent clone of a captured image that consumes full storage resources and can be mounted to a host. It can be refreshed incrementally from another captured image, allowing very fast and efficient data refreshes for ETL and test &amp; development purposes. A LiveClone can also be mounted for direct modification to support operations such as data masking.</td>
</tr>
<tr>
<td>Managed Data License (MDL)</td>
<td>Actifio’s Copy Data Virtualization licensing. It is based on the amount of source data managed.</td>
</tr>
<tr>
<td>Managed Disk</td>
<td>A SCSI Disk presented by a RAID controller and managed by the Actifio appliance. The Managed Disk is not visible to host systems on the SAN.</td>
</tr>
<tr>
<td>Managed disk group (MDiskgrp or MDG)</td>
<td>A collection of Managed Disks that jointly contain all the data for a specified set of Virtual Disks.</td>
</tr>
<tr>
<td>MDisk</td>
<td>These are disks presented to and managed by the Actifio solution</td>
</tr>
<tr>
<td>Mount</td>
<td>The mount function is the most frequently used data access method, as it directly leverages the virtual copies of data stored on an Actifio appliance. By eliminating the data movement from the process, data sets of any size can be accessed instantly on any server.</td>
</tr>
<tr>
<td>Multi-Hop replication</td>
<td>Replication, usually Dedup Backup Replication, is the process that replicates data from a “source” Actifio appliance to a “remote” Actifio appliance, and then from the remote appliance to a third Actifio appliance.</td>
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<tr>
<td>Term</td>
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<tr>
<td>N-O</td>
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</tr>
<tr>
<td>OnVault</td>
<td>The Actifio appliance vaults data to selected cloud storage according to a defined OnVault policy. Supported cloud storage platforms include Amazon S3, Google Nearline Storage, IBM Cloud Object Storage, and Microsoft Azure. Users manage and pay for their own cloud storage directly with the provider.</td>
</tr>
<tr>
<td>Out-of-Band</td>
<td>Out-of-Band is a network architecture describing protected applications that are housed on storage systems that are not connected directly to Actifio storage. See also In-Band and LAN-Free.</td>
</tr>
<tr>
<td>P-Q</td>
<td></td>
</tr>
<tr>
<td>Performance pool</td>
<td>The Snapshot pool.</td>
</tr>
<tr>
<td>Policy</td>
<td>A policy defines when data will be captured, how long it will be retained, and where it will be replicated.</td>
</tr>
<tr>
<td>Policy template</td>
<td>A collection of policies that, together, define when to perform a snapshot, when to perform dedup activity that creates an image, and how long to retain the image.</td>
</tr>
<tr>
<td>PSRV</td>
<td>The platform service is a component of Actifio software that coordinates other CDS and Sky services and functions.</td>
</tr>
<tr>
<td>R</td>
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</tr>
<tr>
<td>RD</td>
<td>Resiliency Director is an optional product that works with CDS and Sky appliances to create and manage data that are part of disaster recovery services.</td>
</tr>
<tr>
<td>Report Manager</td>
<td>The report manager is an optional stand alone software package that reports on data protection and recovery operations.</td>
</tr>
<tr>
<td>Resource Profile</td>
<td>A resource profile specifies if, and which, Snapshot pool is used by Actifio and/or to which remote Actifio appliance data will be replicated. A resource profile is paired with policy templates to protect a specific application by the Application Manager.</td>
</tr>
<tr>
<td>Restore</td>
<td>The restore function reverts the production data to look exactly as it did at the time of the data collection point. Typical use cases for restore would be to recover an entire server or application to a valid state after a massive data corruption or storage array failure.</td>
</tr>
<tr>
<td>RM</td>
<td>Report Manager.</td>
</tr>
<tr>
<td>RPO</td>
<td>A recovery point objective is the maximum period in which data might be lost from an IT service due to a major incident. See RTO.</td>
</tr>
<tr>
<td>RTO</td>
<td>The recovery time objective is a period of time and a service level within which a business process must be restored after a disruption in order to avoid a break in business continuity. See RPO.</td>
</tr>
<tr>
<td>S</td>
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</tr>
<tr>
<td>Service Level Agreement</td>
<td>An Actifio service level agreement is the linkage of a single policy template that defines when to perform actions, and a resource template that defines what storage resources are used by the actions.</td>
</tr>
<tr>
<td>SideBand</td>
<td>See LAN-Free</td>
</tr>
<tr>
<td>Sky</td>
<td>Actifio Sky™</td>
</tr>
<tr>
<td>SLA</td>
<td>See Service Level Agreement.</td>
</tr>
<tr>
<td>Snapshot</td>
<td>A snapshot is the process that captures and stores the state of a Snapshot VDisk as a Snapshot VDisk.</td>
</tr>
<tr>
<td>Snapshot pool</td>
<td>The snapshot pool holds “golden copies” of application data for short-term retention. Data is instantly accessible and not deduplicated. Policies determine how long data is kept in the pool and when data is deduplicated and moved to another pool. The snapshot pool contains Staging VDisk, Snapshot VDisk, and Clone VDisks.</td>
</tr>
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<td>Term</td>
<td>Definition</td>
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</tr>
<tr>
<td>Snapshot VDisk</td>
<td>A Snapshot VDisk is part of a Snapshot pool that preserves the state of Staging VDisk at specific points in time. Snapshots are retained according to a predefined protection policy.</td>
</tr>
<tr>
<td>Staging VDisk</td>
<td>A Staging VDisk is part of a Snapshot pool that contains the Actifio golden copy of an application. It is retained for as long as an application is protected.</td>
</tr>
<tr>
<td>StreamSnap</td>
<td>Direct replication of incremental snapshots from a local snapshot pool to a remote pool, supporting a much lower RPO compared with Dedup-Async replication. StreamSnap is used in high-quality, high-bandwidth IP networks. StreamSnap keeps a full virtual copy of the application on the remote side, available for immediate failover, test failover, or mount operations.</td>
</tr>
<tr>
<td>Sweep</td>
<td>Sweep is the second phase Garbage Collection. It copies data that must be preserved from discrete areas of the dedup store into a new, contiguous area of the dedup store to both defragment storage media and to free areas for reuse. See Garbage Collection and Enumeration.</td>
</tr>
<tr>
<td>Sync Replication</td>
<td>One of the types of replication used by an Actifio appliance. Sync Replication is highly reliable and supports replication between Actifio appliances that are no more than 300KM apart.</td>
</tr>
<tr>
<td>Syncback</td>
<td>Syncback is the process that verifies data that has failed over to be valid before a Failback. Also see Failover.</td>
</tr>
<tr>
<td>System Monitor</td>
<td>One of the services within the Actifio Desktop the monitors the process of jobs.</td>
</tr>
<tr>
<td>Tape-Out</td>
<td>Actifio Tape-Out is a legacy product for long-term storage and archival.</td>
</tr>
<tr>
<td>UDS</td>
<td>Universal data system</td>
</tr>
<tr>
<td>Virtual Data Pipeline™</td>
<td>The underlying architecture and processes of the Actifio data virtualization environment.</td>
</tr>
<tr>
<td>Virtual disk</td>
<td>These are disks presented to applications by the Actifio solution that appear to host systems attached to the storage area network as a SCSI disk. Each VDisk is associated with one I/O group.</td>
</tr>
<tr>
<td>VM</td>
<td>Virtual machine. Actifio supports both VMware and Hyper-V instances.</td>
</tr>
<tr>
<td>Workflow</td>
<td>Actifio Workflows automate access to captured data. Workflows can run according to a schedule or on demand. Workflows present captured data as a LiveClone, a virtual application, or as just the application data.</td>
</tr>
</tbody>
</table>