



**DIVA**

# **Architecture, Concepts, and Glossary**

**Release: 9.0**

**Revision: 1.0**

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# Telestream Contact Information

To obtain product information, technical support, or provide comments on this guide, contact us using our web site, email, or phone number as listed below.

Resource	Contact Information
DIVA Technical Support	Web Site: <a href="https://www.telestream.net/telestream-support/diva/support.htm">https://www.telestream.net/telestream-support/diva/support.htm</a> Depending on the problem severity, we will respond to your request within 24 business hours. For P1, we will respond within 1 hour. Please see the Maintenance & Support Guide for these definitions. <ul style="list-style-type: none"> <li>• Support hours for customers are Monday - Friday, 7am - 6pm local time.</li> <li>• P1 issues for customers are 24/7.</li> </ul>
Telestream, LLC	Web Site: <a href="http://www.telestream.net">www.telestream.net</a> Sales and Marketing Email: <a href="mailto:info@telestream.net">info@telestream.net</a> Telestream, LLC 848 Gold Flat Road, Suite 1 Nevada City, CA USA 95959
International Distributor Support	Web Site: <a href="http://www.telestream.net">www.telestream.net</a> See the Telestream Web site for your regional authorized Telestream distributor.
Telestream Technical Writers	Email: <a href="mailto:techwriter@telestream.net">techwriter@telestream.net</a> Share comments about this or other Telestream documents.

# Preface

This book describes the overall architecture and operational concepts of DIVA. It defines terminology used throughout the DIVA Suite and related documentation. The manual assumes a working knowledge of the Windows operating system.

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**Note:** The initial DIVA release is for Windows only.

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## Audience

This document is intended for the Installation Team, System Administrators, and Users.

## Documentation Accessibility

For information about our commitment to accessibility, visit the Support Portal located at <https://www.telestream.net/telestream-support/>.

## Related Documents

For more information, see the DIVA documentation set for this release located at <https://www.telestream.net/telestream-support/diva/support.htm>.

# Document Updates

The following table identifies updates made to this document.

Date	Update
November 2022	Created new standalone book for 9.0 release.
April 2023	Updated book from DIVA Core to Content Manager. Reverted certain terminology to original terms.
June 2023	Updated Web App term. Added terminology change listing in Architecture section. Updated book for version 9.0. Removed references to Cluster Manager. Removed DIVA View. Updated book with comments received from formal review.
September 2023	Changed name from DIVA to DIVA. Publish PDF.
January 2024	Changed name from DIVA to DIVA. Publish PDF.

# Overview

The purpose of this document is to help with a general understanding of the main components of the DIVA system. The integrated, centralized Glossary can be referred to as you read through other DIVA documentation as necessary. The main, general description of the architecture is within this book; refer to the specific DIVA books for detailed configuration and operations of the system.

The DIVA architecture allows the integration of many different types of servers and technologies. For example, Broadcast Video Servers, Storage Area Networks, and Enterprise Tape Group Managed Storage. DIVA can support interoperability among systems, helping to ensure long term accessibility to valued content, and keeping up with evolving storage technologies.

DIVA supports system installations in Windows 2016, 2019, and 2022 (64-bit) environments. All Windows installations must be in English only.

The installation of DIVA varies from site to site. The exact configuration of your specific DIVA platform is not covered in this guide. For details on your specific DIVA System installation and configuration, consult with your System Administrator, the Telestream Installation and Delivery Team, or Telestream Technical Support.

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**Note:** Telestream recommends keeping the operating system up to date with the latest security patches.

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# Architecture

A DIVA system uses a combination of software modules which can run on a single computer, or can be distributed across different systems. It is an integrated archive solution composed of several hardware and software components described in the following sections.

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**Note:** The initial DIVA release is a Windows-only release; there is no Linux support at this time.

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## Topics:

- [Terminology Updates](#)
- [Hardware Components](#)
- [Software Components](#)
- [Main DIVA Components](#)
- [System Component Interconnectivity](#)
- [General Storage Requirements](#)
- [Software Component Relationships](#)
- [DIVA Modules](#)

## Terminology Updates

The following terminology has been updated to reflect standardization efforts across all DIVA and Kumulate applications. The API code, configuration parameters, and so on, will remain the same as previous releases. However, most user-facing portions of the system use the new terms, which also applied to the Web App.

There will be some variations in the documentation compared to the interface until everything is switched over to the new terminology; the documentation uses the new terms wherever possible.

- DIVA Core is now called DIVA
- Running Requests are now called Jobs
- Request History is now called Job History
- Datahub is now called Actor
- Proxyhub is now called Proxy Actor
- Category is now called Collection
- Source/Destination is now called Unmanaged Storage Repository
- Storage Repository is now called Managed Storage Repository
- Group is now called Tape Group
- Link is now called Storage Link
- Storage Plan Manager is now called Storage Policy Manager
- Drop Folder Monitor (DFM) is now called Watch Folder Monitor (WFM)
- DIVA Command, Control Panel, and the Configuration Utility are deprecated, and have been replaced with the DIVA web app
- DIVA Analytics and DIVAProtect are now included in the Analytics option.

# Hardware Components

Multiple hardware components are required to install the software components and together comprise a complete archiving system. The following sections describe the main system components.

## Storage Devices

DIVA performs operations among different types and formats of storage devices. Examples of usable devices include the following:

- RAID sets store data on hard disk drives
- Tape Managed Storage automate storage on magnetic tapes. The tape library includes robotics, tape drives, and a set of tapes stored in the tape library.
- Tape drives can either be SCSI attached to the Actors, or through a Fiber Channel interface. When connected to a Fiber Channel Switch, they can be shared by multiple Actors. Sharing of resources among the Actors is controlled and coordinated by DIVA. The Fiber Channel Switch provides the connectivity between the Actors and any tape drives that are connected to it.
- DIVA enables archiving operations to an Oracle Storage Cloud account, Oracle Cloud Infrastructure Storage, Amazon S3 AWS Storage account, and Sony Optical Managed Storage.

## Management Stations

At least one management station is required to run the DIVA software component, and the library control software supplied with the library to control the robotics. This is called the Main Management Station. The Main Management Station features a mirrored (RAID1) configuration for the data disk where the databases and all essential data are stored.

Because the Management Station is essential to the operations of the archive system, it is strongly recommended to also configure a backup Management Station. In case of failure, the main station is stopped and the backup station is started.

## Actors and Proxy Actors

Dedicated Windows or Linux servers can host the Actor component. The Actor software can also typically be installed directly on a production server.

Core Proxy Actors enable remote resources not visible to regular Actors to become visible and usable to regular Actors through a Proxy. A Proxy Actor is simply an Actor that acts on behalf of another Actor. In the most common case, a Proxy Actor will read or write from a remote resource at the request of a regular Actor. DIVA tells a regular Actor where it can find a proxy that will give it access to a needed remote resource through a new link between an Actor and its Proxy Actor. Linux-based Actors only support Telestream Vantage transcoding operations.

## DIVA

DIVA is the main component in a DIVA system and can be installed on Windows or Linux platforms. As a purchasable option, DIVA also supports Main and Backup systems. A Backup DIVA must be configured to use the DIVA Backup Service.

## Network Devices

The connections between the DIVA system components are achieved through a 10/100BaseT or Gigabit Ethernet hub or switch.

## Other Components

Other systems and components interacting with the DIVA system include the following:

- The applications controlling the archive operations either to move objects to the archive or to retrieve objects from the archive, and to obtain information about the archive systems or objects stored within the archive. These applications are referred to as Archive Initiators. Examples of an Archive Initiator are Broadcast Automation Systems, or MAM (Media Asset Management) applications.
- The production servers are where objects (for example, video files) are produced or from where they are broadcast. For example, a video server is a production server. Production servers can be the source of the objects to archive or the destination of the objects to retrieve from the archive.
- The production network is typically a high-speed LAN connecting the production servers together to allow object transfer between the servers. It also allows the connection of the Actors that are either attached directly to the high-speed network or through a gateway device provided by the production server manufacturer.

# Software Components

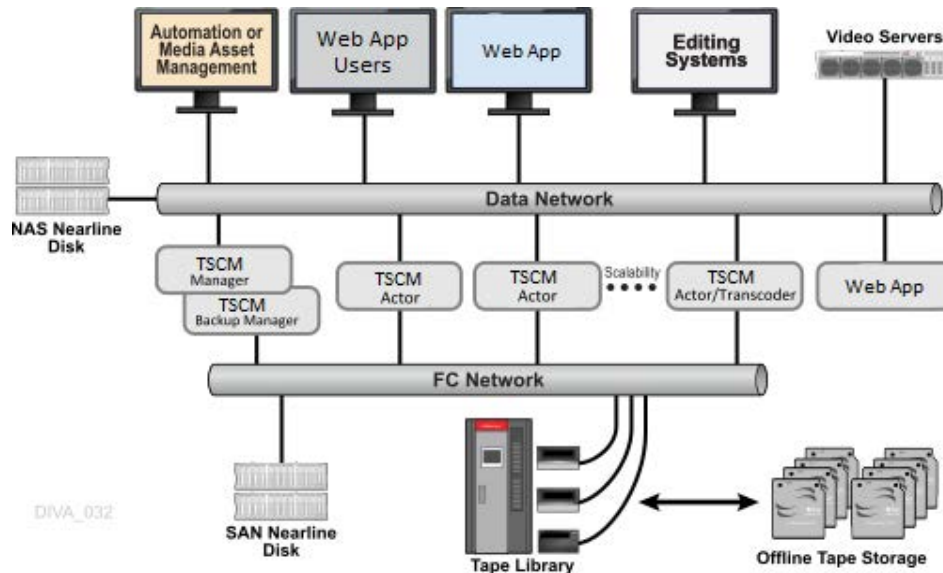
DIVA software includes the following components:

- DIVA
- Web App
- Various APIs
  - REST API (recommended and used by the Web App)
  - C++ API)
  - Java PI
  - WS API
- Backup Service (BKS)
- Auto-Discovery Agent
- Checksum Support and Content Verification
- Analytics App (See the Analytics App User Guide for information)
- WFM (Watch Folder Monitor - optional)
- SNMP Agent (optional)
- Customer Information Collection Tool
- VACP Converter (optional)
- Manager
- Actor
- Proxy Actor
- Robot Core
- DIVA Connect (See the DIVA Connect documentation for information—optional)
- Avid Connectivity (See the Avid Connectivity and Tools book - optional)
- Client APIs
- SPM (See the Storage Policy Manager documentation - optional)

Third party control software may also be provided by the library manufacturer to control the library robotics. The name of the software depends on the type and brand of the library used in the DIVA solution.

## Main DIVA Components

The following figure represents a DIVA configuration with the main DIVA software components installed on different servers. DIVA Connect (used to access multiple DIVA systems) is not represented and is generally installed on a dedicated server.



The main DIVA components are as follows:

### Manager

The DIVA component of the archive also hosting the archive system database.

### Manager Cluster

Microsoft Cluster Manager and clustering is not currently supported in DIVA release 9.0.

### Actor

Responsible for all data transfers (Archive, Restore, Copy, Repack, and so on).

### Actor and Manager (Single Computer)

Systems running both Actor and Manager functions on a single computer. This configuration should try to be avoided for performance reasons, and is only usable for entry level configurations.

## Robot Manager

Although you can use DIVA to only manage disk storage or cloud storage, storage capacity can be further expanded by adding one or more tape Managed Storage. In these cases, the Robot Manager module provides an intermediate software layer for DIVA to interact with many different types of tape Managed Storage. It is connected to DIVA through TCP/IP.

## System Component Interconnectivity

On the data path, a DIVA solution is connected on the storage side to the Tape Group library, or shared disks, or both. On the source and target side, it is connected to the video servers, NLE, or file servers.

## Storage Connection

SAN, NAS, or Direct Attached technologies can be used. Different types of interfaces are required on the servers to support the different types of storage devices as follows:

- Fiber Channel HBA (Host Based Adapter) for SAN
- SCSI Bus or HBA for Direct Attach
- 10 Gigabit Ethernet for NAS

## DIVA Connect 4.0

DIVA Connect provides a unified view of archived digital assets across multiple, distributed DIVA systems and the cloud. It facilitates the moving of content back and forth among DIVA sites, and from customer Server and disks. DIVA Connect assists with disaster recovery, content distribution, access control, performance, and content availability.

DIVA Connect 4.0 is used for DIVA 9.0 and later, and is backward compatible with earlier releases.

## DIVA Web App

Used for configuring, monitoring and managing the DIVA system. The Web App is a software utility that connects DIVA. Multiple Web App instances can be operated simultaneously from any computer that has TCP/IP connectivity. The Web App is browser-based and is platform independent.

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**Note:** The Web App replaces both the legacy DIVA Control GUI and the legacy Configuration Utility Java-based applications.

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## Analytics

The DIVA Analytics option is a utility that collects operational statistics from the DIVA system to monitor and maintain the archive's subcomponents (servers, media, drives, tapes, and so on). Analysis of these statistics allows both proactive and reactive maintenance of the DIVA system. See the DIVA Analytics App User Guide for more information.

## General Storage Requirements

The following table describes the main storage characteristics of the various components:

Server	CPU	System Disks	Cache and Disk	Data Disks
Manager Cluster <sup>1</sup>	1	RAID1	No	No
Manager	1	RAID1	No	No
Actor	1	RAID1	RAID5	Nearline (optional)
Actor and Manager	1	RAID1	RAID5	Nearline (optional)
Actor and Transcoder	2	RAID1	RAID5	Transcoding area plus optional Nearline disk.
DIVA Connect	1	RAID1	No	No

1. Manager Cluster is only valid in a Windows based environment, not in Linux.

## Software Component Relationships

The following figure displays the relationships and dependencies among the software components of a DIVA system. It specifically points out the client/server links between them.

A client/server link between two components does not necessarily mean that the server software must be started before the client. For example, the Manager to Actor connection. Each Actor acts as a server and the Manager initiates a client connection to the Actor. However, an Actor can be launched after the Manager is running since the Manager will attempt to reconnect to the Actor at periodic intervals.

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**Note:** DIVA can run independently of the Web App. It can be launched at any time after the Manager is running.

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# DIVA Modules

The following modules are integrated into the DIVA system:

## Backup Service (BKS)

The DIVA Backup Service (BKS) is responsible for backing up the DIVA Postgres database, the MongoDB Metadata database, and ElasticSearch.

## DBAgent

The DBAgent Service performs database specific tasks (that is, backups and restores), monitors their progress, and reports disk usage. Database maintenance functionality can easily be added if necessary, but only the specific backup tasks are currently implemented.

See the Database and BKS documentation on the DIVA Support Portal for detailed information.

## Metadata Database Service (MDS)

To effectively operate with large volumes of files and folders and other metadata, DIVA stores the metadata separately from the Postgres database in the DIVA Metadata Database. The DIVA Metadata Database is also used to store the information for Complex Objects. As such, it replaces the FBM (Flat file Based Metadata Database or Mddb) that was used in DIVA Core releases up to 8.1.

A dedicated Windows Service called Metadata Database Service is used to control storing and retrieving information from the Metadata Database.

## Migrate Service

The Migrate Service is installed as part of the DIVA Suite's standard installation. It is located in the `%DIVA_HOME%\Program\MigrationService\` folder, and runs as a Windows Service.

## Notification Service

The notification service is based on a message broker that is used to communicate and exchange information between the components of DIVA.

## REST API

The REST API detailed documentation is included in DIVA as HTTP documentation; which is accessible directly from within the REST API. The Swagger documentation for the REST API services is accessible at <https://localhost:8765/api-docs>.

In 9.0 a new Gateway and Discovery service are used.

Only the API configuration settings of the Discovery and Gateway services may be changed. No other settings should be changed and are present for ease of development and testing.

Telestream recommends using the REST API rather than the previous existing APIs (that is, DIVA Enterprise Connect, DIVAS, Java and C++). Although all previous APIs remain available, the REST API offers new and enhanced features. It is integrated into the DIVA and is required by the Web App to function.

## Rosetta

Rosetta emulates both the XML & REST APIs of Flashnet so that a DIVA system will appear to an end-user as a Flashnet system, focusing on API usage by Avid MAM plugins for Flashnet.

This allows restoring content archived through Rosetta, as well as content archived to a Flashnet system that was migrated to DIVA.

The Web App allows this functionality to be enabled/disabled, and configuring some behavior of the system (Mapping of values, or entry of default values to use).

## Storage Policy Manager (SPM)

The SPM (Storage Policy Manager) software component provides object life cycle management (interacting with DIVA), and is typically installed on the same computer as DIVA. For example, an archived object can reside on a specific medium the first day, and migrate (over time) to a different medium according to your established policies and rules.

See the Storage Policy Manager documentation on the DIVA Support Portal for detailed information.

## Watch Folder Monitor (WFM)

Watch folder monitoring allows users and third party applications to deliver content to be archived by copying related files to a folder, an FTP server, or a CIFS share.

See the Watch Folder Monitor documentation on the DIVA Support Portal for detailed information.

## Video Archive Communications Protocol (VACP)

The Video Archive Communications Protocol is developed by Harris Automation Solutions and used by some automation systems for interfacing to an archive system. DIVA has its own API for communicating with the Manager, which is not compatible with VACP.

To provide interoperability without the need to redevelop the archive interface at the automation level, this module is provided to act as an interface to convert VACP commands from the attached automation system to DIVA API commands on computers that have TCP/IP connectivity to DIVA.

# Unmanaged and Cloud Storage Repositories

## Topics:

- [Unmanaged Storage Repositories](#)
- [Alto Disk Archive](#)
- [Cloud Storage Repositories](#)
- [Miscellaneous Utilities](#)

# Unmanaged Storage Repositories

A Source Unmanaged Storage Repository is defined as any connected system that has content intended to be transferred to DIVA. A Target Unmanaged Storage Repository is defined as any connected system that requires content to be transferred to it from DIVA. Examples of both are Broadcast Video Servers, FTP Servers, or Disk Storage. The Source and Target Unmanaged Storage Repositories that are used in DIVA jobs are predefined in the DIVA configuration.

Actors in the Linux operating system support UNC paths for CIFS sources and destinations. The Actors will automatically mount the SMB shares to access the Unmanaged Storage Repository Servers.

UNC paths are supported for SMB Servers and managed disks if the UNC path is directly mounted on the Windows Actors.

The Source and Destination Unmanaged Storage Repositories that are used in DIVA jobs are predefined in the DIVA configuration and are accessible in the Web App's Resources Management > Unmanaged Storage menu item. In DIVA's Server configuration, each server type or disk file system is given a unique name and are configured as follows:

## Source Only

DIVA will only archive files from the server or disk file system.

## Destination Only

DIVA will only restore files to the server or disk file system.

## Source and Destination

DIVA will archive and restore files to and from the server or disk file system.

Although a detailed explanation of the configuration of a Source or Destination Server is beyond the scope of this guide, a brief overview of the configuration is included because they can influence how jobs are issued to them, and influence how two or more simultaneous jobs to them are managed in the Current Jobs Queue.

Generally, each Source and Destination Unmanaged Storage Repository has the following parameters configured. These are common to all jobs that involve that Server:

- The Source Type is the protocol or access method used when interacting with the target device.
- The maximum number of read and write transfer sessions and the total maximum number of read/write sessions combined. This identifies the limits on the number of simultaneous jobs that DIVA will execute concurrently on the target device, or prioritizing write (Restore) operations over read (Archive) operations.

- Define the maximum bandwidth allowable to DIVA for transfers to or from the device. This may be used to throttle data transfers where the target device is shared with other Networks or third party applications.
- The Default Quality of Service (QOS). This is the QOS used when Default is specified in a job's Quality of Service field.
- Define Connect Options that must be provided (or that can also be optionally specified) for the specific protocol or access method of the target device. Examples of Connect Options are recursive subfolders, user names or passwords, or other options specific to the selected source type. DIVA ignores this parameter if no options are specified.
- The Root Path to the files to be archived on the source, or restored to on a destination. This is always specified as an absolute directory path on the target device. For example C:\Exported\MPEG2. The Root Path configuration also depends on the source type, and can be left blank in some cases (and will be ignored by DIVA).  
For Local or Disk source types, the Root Path specifies the mount point of the device in the local file system.

If the Connect Options and Root Path parameters have been defined for a Server configuration, they may not be appropriate for every job submitted. DIVA allows these parameters to be specified in a DIVA job to that source or destination (at the job level). Whether a job can override these Server attributes depends on the source type. See the DIVA Source and Destination Servers Table in the DIVA Installation and Configuration Guide for a comprehensive list of these options, paths, and how they interact with those specified at the job level.

The Files Path Root specified in a job can either be appended to the Root Path specified in the Server configuration, or override the Root Path entirely if it is specified as an absolute path.

## Alto Disk Archive

Alto Disk Archive is a type of library of disks. Instead of mounting/dismounting tape, this library is designed to mount/dismount the file system of unpluggable disks and map them to a SMB share.

## Cloud Storage Repositories

- EMC ECS (Elastic Cloud Storage) Integration  
Instances stored on EMC Elastic Cloud Storage are local instances whose priority is lower than other types of local disk instances, but a higher priority than tape storage instances.
- OCI (Oracle Cloud Infrastructure)  
DIVA includes support for storing data in Oracle Cloud Infrastructure. The Web App is enhanced to support OCI storage operations. OCI services combine cloud elasticity and utility with granular control, security, and predictability of on-premise infra-

structure. OCI delivers high performance, flexibility, availability, and is cost-effective.

- Amazon S3 Integration

DIVA includes support for Amazon S3 AWS integration. Storage accounts allow a user to configure programmatic access to a user's AWS account. The configuration data in a DIVA storage account is exclusively used by DIVA's Actors to query S3 storage and transfer content to and from S3 buckets.

- Scality Zenko

DIVA includes support for Scality Zenko integration as both Storage Accounts and Servers. Storage accounts allow users to configure programmatic access to a user's account.

- Cloudian

DIVA includes support for Cloudian integration as both Storage Accounts and Servers. Storage accounts allow users to configure programmatic access to a user's account.

- NetApp StorageGrid

DIVA includes support for NetApp StorageGrid integration as both Storage Accounts and Servers. Storage accounts allow users to configure programmatic access to a user's account.

- Alibaba OSS

DIVA includes support for Alibaba OSS integration as both Storage Accounts and Servers. Storage accounts allow users to configure programmatic access to a user's account.

- Data Expedition

DIVA can (optionally) interface with the server named Data Expedition Expedat Server. The Expedat Server (also known as servedat) is very similar to the FTP\_STANDARD server and CIFS, and offers AES encryption capabilities. The main difference among them is the protocol used for operations.

- Cloud Replicated Bucket Scanning

The purpose of this feature is to keep scanning a cloud bucket containing AXF instances (AXF and AXF\_RF). This bucket is populated by a third party software:

- Can be a bucket replication software
- Can be another DIVA system

In both cases, DIVA will scan the bucket for new objects and populate its database when new objects are detected.

## Miscellaneous Utilities

DIVA includes various miscellaneous utilities, some of which are associated with the modules previously listed. The utilities are as follows:

- *SNMP Agent (Optional)*

The SNMP (Simple Network Management Protocol) Agent and MIB (Management Information Base) supports status and activity monitoring of DIVA and its subsystems to a third party monitoring application through the SNMP protocol.
- *VACP Converter (Optional)*

VACP (Video Archive Command Protocol) is a protocol developed by Harris Automation for interfacing to an archive system. DIVA has its own API for communicating with DIVA, which is not compatible with VACP.
- *Customer Information Collection Tool*

The Customer Information Collection Tool is a utility feature used by Telestream Support and Development teams to collect information on the client's DIVA system to analyze and diagnose issues uncovered in the field. This utility is included in the DIVA delivery, but is only intended to be used by Telestream personnel.
- *Client API*

The Client API is a set of documented functions enabling external applications, acting as clients, to use the services offered by the DIVA system. A library of client functions is provided and must be linked to each client application. These functions encapsulate client commands into DIVA job messages sent over a TCP/IP connection to DIVA using the REST API.
- *ConfigurationPrinter*

Prints the current DIVA configuration. There are no command-line parameters.
- *DivaScript*

This utility enables using command line orders to execute jobs and operations.
- *GetVersion*

Returns the release number for a specific application. The `application_path` is the valid path to the application being checked.
- *RDTU*

The RDTU (Recover Damaged Tape Utility) recovers object instances that reside on a damaged tape. The utility can recover instances that have valid copies on other available media (that is, internal tape or a connected disk array) within a local or remote DIVA system. There are no command line parameters. The settings and configurations are defined in the `rdtu-conf.xml` configuration file.



# Glossary

## **Action**

A predetermined reaction of a metric surpassing a threshold value by one of the variables from its internal state. This term is used in the Storage Policy Manager associated with a slot and executed during the slot's open period.

## **Archive Related Operations Initiator**

An entity submitting jobs to DIVA (typically, an automation process).

## **Arrays, Disks, and Cache**

DIVA uses HDD (Hard Disk Drive) technologies for both the storage of objects and for transient storage during data transfers (disk cache).

Any disk that DIVA uses is assigned to an array. An array is a logical association of one or more disks for the storage of objects. Disks that are configured as cache disks are also assigned to an array, typically named CACHE.

A disk name is associated with a mounting point. Archive jobs can be submitted with an array as the target. DIVA is responsible for choosing the disk location to write the data when several disks belong to the same array.

## **AVID Connectivity**

Avid Connectivity with DIVA transfers archival data to and from DIVA in specific video formats and enables archiving and retrieval of single clips, or a sequence of clips. Avid Connectivity is no longer packaged with DIVA and is a separate installation process. Additional installation is required for certain plugins for both AMC and TMC. See the DIVA Avid Connectivity and Tools book for detailed information.

## **AXF (Archive eXchange Format)**

The Archive eXchange Format is based on a file and storage media encapsulation approach which abstracts the underlying file system, operating system, and storage technology making the format truly open and non-proprietary. AXF helps ensure long-term accessibility to valued assets, and keeps up with evolving storage technologies.

**AXF Disk and Tape Storage Formats**

AXF (Archive eXchange Format) is an open format that supports interoperability among disparate content storage systems and ensures the content's long-term availability regardless of how storage or file system technology evolves.

**CA (Certificate Authority)**

A CA (Certificate Authority) is an issuer who receives the CSR and returns the SSL certificate with its digital signature.

**CAP (Cartridge Access Port)**

The Cartridge Access Port is used for inserting and removing tape cartridges to and from a Robotic Tape Library without interrupting library operations.

**CAP ID**

The designation of a slot in the Tape Library.

**Checksum Support and Checksum Types**

The purpose of the Checksum Support and Content Verification program is to introduce additional levels of verification into the DIVA system. This feature introduces checksum generation and verification for each file managed by DIVA. Supported checksum algorithms in DIVA include MD2, MDC2, MD5, SHA, SHA-1, and RIPEMD160.

A mathematical value computed from a group of data being transmitted, and transferred with the data. The receiving device compares the checksum with its own computation, and if it differs from the received checksum, it requests the transmitting device to resend the data or generates an error. Each checksum has a specific algorithm, each of which has its own level of verification.

Additional checksum verification is done at the Oracle Storage Cloud level. See the Storage Cloud documentation for information.

**CIFS**

The CIFS (Common Internet File System) is a Microsoft sharing protocol. Linux based Actors do not support UNC paths for CIFS Source and Target Servers.

**Collection**

Part of the access key to an object. Collections (Categories) are an approach to grouping an object with other similar objects having particular shared characteristics. It must not be confused with tape groups, mediums, or arrays, which are storage concepts.

**Complex Object**

When the Metadata Database feature is enabled, the Complex Object feature is available. DIVA can track significantly more than the 10,000 file per object limit set for non-complex objects using Complex Objects. The actual amount scales with system processing power and storage capacity. A Complex Object stores more information about the files and folders in an archive, such as subtotals for each directory.

**Complex versus Non-Complex Objects**

A Complex Object differs from a non-complex object in some key ways. For example, the file and folder metadata information of a Complex Object is stored in the Metadata

Database (MDS) not in the Postgres database. The file contains the file names, folder names, checksums, and files sizes. The directory that contains these files is the Metadata Database Root Directory. A Complex Object must be stored in AXF format either on tape or on disk.

**Component**

A file that is part of an object.

**Critical Section**

A piece of code that accesses a shared resource (data structure or device) that must not be concurrently accessed by more than one execution thread.

**CSR (Certificate Signing Request)**

A CSR is an encoded file that is given to a CA when requesting an SSL certificate. It contains information that will be included in the certificate including the holder's name, serial number, expiration date and the public key. The CA returns the signed SSL certificate with its signature.

**DET (Dynamically Extensible Transfers)**

Dynamically Extensible Transfers are an Avid protocol.

**DIVA Connect Complex Object WAN Transfers**

DIVA has (optional) WAN acceleration functionality built in that allows it to take full advantage of long distance, high latency, network paths (such as private site to site links or the public Internet), and can perform transfers of complex objects efficiently using the Data Expedition MTP/IP protocol.

**DNS (Domain Name Service)**

A system for naming computers and network services that is organized into a hierarchy of domains. DNS services resolve IP addresses to host names for proper network routing.

**DPX (Digital Moving-Picture Exchange)**

The DPX format is a high quality video format that consists of one or more files for each frame of video. This format is likely to be used with complex objects.

**DSM (Disk Space Monitor)**

A module in Storage Policy Manager that assists in array cleanup when the object level reaches the High Watermark.

**Externalization**

An object instance is ejected (externalized) when one of the tapes containing the object's instance elements is ejected. An object is externalized when all of its instances are ejected. An object is considered inserted when at least one instance of the object is inserted.

**Event**

One operation (such as a job) usually requires multiple events to complete an operation. An event provides all applicable information relating to the single task (for example, names, IDs, parameters, numbers, and so on).

**Filter**

Determines what objects are affected by what Storage Plan.

**FOIB (File Object Information Base)**

FOIB is persistent storage used by Watch Folder Monitor to track its processing state.

**FQDN (Fully Qualified Domain Name)**

The complete domain name for a specific computer, or host, on the Internet. The FQDN consists of two parts: the host name and the domain name. For example, telestream.net.

**Initiator**

See [Archive Related Operations Initiator](#) previously described.

**Java Keystore**

The JAVA Keystore is a password protected encrypted file repository containing the Key pairs, SSL certificates, and CA certificates.

**Jobs**

A job is an operation running in DIVA which progresses through steps (migration, transfer, and so on) and ends as either Completed, Aborted, or Canceled.

Jobs can be issued through the Web App or an Archive Initiator. The most common job types are for transferring content to the archive (referred to as an Archive job), or transferring content out of the archive (referred to as a Restore or Partial File Restore job).

The different jobs available under the Web App's Action menus are as follows. Refer to the DIVA Operations Guide for details on the various job types available in DIVA.

- Archive
- Delete
- Delete Instance
- Require NOT ENABLED IN 9.0 RELEASE
- Release NOT ENABLED IN 9.0 RELEASE
- Cancel
- Change Priority
- Assign Storage Plan
- Restore
- Partial Restore
- Multiple Restore (or N-Restore)
- Copy
- Copy As
- Associative Copy
- Repack Tape

- Verify Tape
- Insert Tape
- Eject Tape
- Export Tape
- Import Tape
- Migrate Content
- Automatic Repack
- Stage

**Journal**

A self-maintained, automated, and configurable storage for events.

**Key Pair**

A Key Pair consists of two uniquely related cryptographic keys; a Public Key and a Private Key (basically long random numbers).

The Public Key is what its name suggests - Public. It is made available to everyone through a publicly accessible repository or directory.

The Private Key must remain confidential to its respective owner. Because the key pair is mathematically related, whatever is encrypted with a Public Key can only be decrypted with its corresponding Private Key, and vice versa.

**Legacy Format**

Proprietary storage format used in DIVA Core releases 1.0 through 6.5.1.

**MDF (Metadata File and .mdf)**

The term MDF is an acronym for the Watch Folder Monitor Metadata File. The MDF is a file containing information about the files included in a File Set, and has the file extension .mdf.

**Measurement**

A reading of specific information from an event or a resource. For example, the duration of a disk write operation, or the occurrence of a read error on a tape drive.

**Media Format**

Tapes and disks can be formatted as either AXF or Legacy (the format used before release 7.0) format. The format is set for Tape Groups and disk arrays during configuration. Complex Objects must be stored on AXF-formatted media.

**Medium (Media)**

Set of storage resources. Currently DIVA provides two types of media: groups of tapes and arrays of disks. `DIVA_archiveObject()` and `DIVA_copyToGroup()` jobs transfer to a Medium (media). Also, storage media accessible to SPM (Disk Arrays and Tape Groups).

**Metadata Database**

The metadata database is the location where the metadata for components of Complex Objects are stored in the DIVA system.

**Metadata File**

The file listing the Object Name and Object Collection contained on a tape and its location.

**Metasources**

The Metasource source type allows several currently defined DIVA Servers sharing the same online storage (or monitoring the same folder or FTP server for Watch Folder Monitors) to be combined and considered a single DIVA Server configuration. This unique (and optional) feature enables DIVA to provide automatic load balancing and fail-over capabilities in case of one or more of the individual servers going offline.

**Metric**

An instance of one Metric Definition for a specific resource can be either enabled or disabled. Each Metric is associated with a specific resource and can receive a flow of measurements from that attached resource.

A metric has an internal state that consists of several numeric values are updated when given new measurements while providing read access to this logically consistent state. Each metric can be used as a measurement value for the state of another metric. The internal state can be reset at any time.

**Metric Definition**

Defines how a metric is calculated by specifying which events are examined, which measurements are extracted, how they are aggregated (collection type), and which resource the aggregation is based on.

See the Analytics App User Guide for more information.

**Metric Type**

The metric types are as follows:

- Hourly metric types are calculated every hour for the associated resource.
- Daily metric types are calculated every day for the associated resource.
- Monthly metric types are calculated every month for the associated resource.
- Yearly metric types are calculated every year for the associated resource.

Lifetime metric types are calculated throughout the lifetime of the associated resource.

**Migration**

Copying of data from a DIVA media to a tape (Archive job) or from a tape to a DIVA media (Restore job).

**MPIO (Multipath I/O)**

MPIO (Multipath I/O) is a Microsoft-provided framework that allows storage providers to develop multi-path solutions that contain the hardware-specific information needed to optimize connectivity with their storage arrays.

**Mutex (Mutual Exclusion)**

Mutual Exclusion avoids the simultaneous use of a common resource (that is, mutual exclusion among threads).

**Name**

Part of the access key to an object. Names (file names) typically identify the object based on the content within the object.

**NIC Teaming**

The process of combining multiple network adapter cards together for performance and redundancy reasons. Microsoft refers to this as NIC Teaming, however other vendors may refer to this as bonding, balancing, or aggregation. The process is the same regardless of which solution is used or what it is called.

**Non-complex Objects**

Objects with less than 1,000 files are considered non-complex objects. The maximum number of files an object can hold is configurable.

**Object**

An object is a DIVA logical container for all files consisting of an asset from the original source. Assets from some sources may have separate video, audio and metadata files. When archived in DIVA all of these files are referenced as a single object. When the object is restored to a target, all files that were originally associated with that asset are automatically restored by DIVA.

**Object Instances**

Mapping of an object's components onto a set of storage resources belonging to the same storage space. Deleting instances cannot result in deleting the related object. The deletion of a unique instance is not permitted.

The storage managed by DIVA falls into three distinct categories:

- Online Storage (tapes within a library)
- Nearline Storage (disks and cloud storage)
- Offline Storage (externalized tapes)

The Name and Collection of an object in DIVA must be unique. However, multiple copies of that object can be created in one or all three of the above classes. Each copy of an object (including the original archived object itself) is known as an object instance.

**OU (Organizational Unit)**

An Organizational Unit is a subdivision within an Active Directory into which you can place users, Tape Groups, computers, and other organizational units. You can create organizational units to mirror your organization's functional or business structure. Each domain can implement its own organizational unit hierarchy. If your organization contains several domains, you can create organizational unit structures in each domain that are independent of the structures in the other domains.

**Quality of Service**

The QOS (Quality of Service) parameter defines how a file is transferred to and from a tape, from a source, or to a target.

**Repack**

Elimination of blank blocks between two objects on a tape (these blocks are caused by the deletion of objects), by moving the objects to a different, empty tape.

**Resource**

Used to denote the necessary elements involved for processing jobs (for example, Actors, disk, drive, and tape). A resource is a uniquely identified element of the DIVA system. Analytics App references them by events and metrics. The following are examples of resources in DIVA:

- Tape with Barcode ABE6785
- Actor Actor01
- Tape Drive Serial Number 134001021

**Resource Type**

These are generic types of resources. For example, tapes, tape drives, jobs, or objects.

**Robot Core**

The mechanical tape system used with DIVA to insert and eject tapes to and from the tape library.

**SAS (Serial Attached SCSI)**

A point-to-point serial protocol that moves data to and from computer storage devices such as hard drives and tape drives.

**Set (of tapes)**

Every tape in a DIVA system belongs to one and only one Set. If the tape is not available to DIVA, it belongs to Set #0, otherwise it belongs to a set with a strictly positive ID (for example, Set #1). Each Tape Group is associated with a Set. When the Tape Group needs an additional tape, it takes it from its associated Set.

**Slot**

Contains the action to be applied when the associated Storage Plan is executed.

**Source**

A system that produces data to be archived in the DIVA system (for example, video servers, browsing servers, remote computers, and so on). Source Servers can also be used as a [Target \(Destination\)](#) for certain operations.

**Spanning**

Splitting an object's component onto several tapes (usually two). This can occur when the component size is larger than the remaining size left on the initial tape.

**SSL (Secure Sockets Layer)**

A Secure Sockets Layer is a standard security protocol for establishing an encrypted connection between a server and a client. Specifically, it encrypts the connection and



the data transmitted along the connection. To achieve a secure connection, a service needs a Key Pair (Public Key and Private Key) and SSL Certificate.

### **SSL Certificate Authentication**

An SSL certificate is a digital certificate that authenticates a service in network connections. To generate an SSL certificate, you must create a CSR (Certificate Signing Request) for your service Key Pairs and have it signed by your CA (Certificate Authority). An SSL certificate contains the following information:

- Certificate holder's name
- Certificate serial number and expiration date
- A copy of the certificate holder's public key
- Digital signature of the certificate issuing authority

### **SSL Certificate Chain**

There are two types of CAs (Certificate Authorities): Root CAs and Intermediate CAs.

A certificate chain is an ordered list of certificates, containing an SSL Certificate and Certificate Authority Certificates that enable the receiver to verify that the sender and all CAs are trustworthy using its trust store. The chain (or path) begins with the SSL certificate, and each certificate in the chain is signed by the entity identified by the next certificate in the chain. Any certificate that sits between the SSL Certificate and the Root CA Certificate (last certificate in the chain) is called an Intermediate CA Certificate. The Root CA is at the end of the chain and it signs the intermediate CA certificate, and the Intermediate CA signs the SSL certificate for the services.

For example, when a service receives its peer's SSL certificate chain that is trying to connect during the SSL handshake process, it verifies its peers SSL certificate in the chain using the Intermediate CA certificate next in the chain. It then verifies the Intermediate CA certificate by looking for the Root CA certificate that signed the intermediate CA certificate in its trust store. This verification completes the Certificate Chain. Connection is not established if the full chain verification fails.

### **Step**

The current state of progression of an action or process.

### **Storage Media Format**

In DIVA, a Tape Group or Disk Array has a Media Format parameter that indicates which storage media format to use when creating new archived objects. The Media Format can be set to either DIVA Legacy format or one of the AXF formats. This setting can be changed at any time and it does not influence content already stored.

- Tape Storage Media Format

Although a Tape Group can contain more than one storage format, an individual tape has (at most) one storage media format. DIVA assigns the tape media format to an empty tape when it writes the first object to that tape.

- Disk Storage Media Format

Unlike tapes, disks do not have a format. DIVA allows storing objects in different media formats on the same disk.

- **Object Instances Media Format**

Every tape and disk object instance is assigned a format of Legacy or AXF. The format of a tape or disk instance is assigned when the instance is created and is the format of the tape on which the instance resides. All instances on a tape must have the same format.

**Storage Plan**

Actions to execute when new content arrives.

**Storage Policy Management (SPM)**

Storage Policy Manager software component enables object life-cycle (interacting with the Manager) management, and is typically installed on the same system as the Manager. For example, an archived object can reside on a specific medium the first day, and migrate (over time) to a different medium according to the policies and rules established by the user. Manager executes the object life-cycle migration as a background activity by following the rules and policies defined in the corresponding Storage Plan.

**Tape Groups and Sets**

A Tape Group is a logical notion for characterizing a set of object instances. This concept has a direct influence on the instance's storage policy for tapes. Instances of the same Tape Group will be stored on the same tapes. However, objects cannot have multiple instances stored on the same tape.

Disks are logically assigned to arrays for the storage of objects, but tapes are logically associated together in Tape Groups. Tape Groups include the following functionality:

- Sony ODA drives are supported
- Tape Compression
- Tape Group Encryption
- Tape Spanning
- Protected Mode
- Tape Label Management

Tape Groups are based on the DIVA Tape Set. Each tape inserted in the system is assigned to a Set. Tape Groups are then associated with a single Set. Multiple Tape Groups may be associated with the same set. No Tape Group can use the set number 0.

Several kinds of tape can be used in a DIVA system. Tape Groups can be defined either by using a Set, in which you assign only tapes of the same type, or by defining the Set in which you can mix tape types. Therefore, the first case specifies the tape type that stores the object instance. See [Set \(of tapes\)](#) in this section for more information.

**Target (Destination)**

A system that receives restored data in the DIVA system (for example, video servers, remote computers, FTP servers, and so on). Target servers can also be used as a source for certain operations.

**Transcoder Support**

The DIVA Actor can integrate with a transcoder engine to provide real time transcoding of material as it is archived or restored, or to create objects from already existing content within the archive. Currently, integration to BitScream products, Telestream Flip Factory, and Telestream Vantage are supported. However, multiple transcoders are only supported for Vantage.

**Transfer**

Copying data from a source to a DIVA media (Archive job) or from a DIVA media to a target (Restore job). See [Jobs](#) for more information.

**TRU (Tape Reading Utility)**

Used in DIVA Core releases 6.5 and earlier to read tapes.

**Trust Store**

A Trust Store contains the certificates of CAs (Certification Authorities) you trust. For example, when a service receives its peer's SSL certificate that is trying to connect during SSL handshake process, it verifies that its peer's SSL certificate's digital signature is signed by one of the trusted certificates in its trust store. If the certificate is not in the Trust Store, the SSL handshake fails and the connection is not established.

**UUID (Universally Unique Identifier)**

A Universally Unique Identifier uniquely identifies each object created in DIVA across all Telestream customer sites except for objects created through Copy As jobs. An object created using a Copy As job will contain the same UUID as that of the source object.

**Watch Folder (Drop Folder)**

A folder on a local disk, FTP server, or a CIFS shared folder designated for Single File mode, File Set mode, or both, storage that will be monitored by Watch Folder Monitor and from which files will have operations performed on them.

**Watch Folder Monitor (WFM/DFM)**

The Watch Folder Monitor monitors pre-configured Watch Folders on the system. When new files are detected, one or more operations are performed on the files depending on the folder configuration. Refer to the Watch Folder Monitor User Guide for more details.

Watch Folder Monitor provides automatic monitoring of newly created files in up to 20 local or FTP folders (or combinations of the two). One (or multiple) files in FTP folders per object are supported. When a new file (or FTP folder) is identified, WFM issues an archive job automatically to DIVA to archive the new file or folders. After the files are successfully archived, they are automatically deleted from the Source Server.

**Watch Folder Monitor Incomplete File**

Watch Folder Monitor Incomplete files are files that were put into the Watch Folder without the metadata file (for File Set folders), and files that cannot be archived after a specific number of attempts.