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1 Introduction

1.1 Document Purpose and Scope

This guide outlines general operational guidelines for the Oracle DIVArchive Suite release 7.3. Included are start-up and shut-down procedures for various software and hardware components of a typical DIVArchive System, and the control and monitoring aspects of the DIVArchive platform using the DIVArchive Control GUI and Configuration Utility.

The architecture of DIVArchive allows the integration of many different types of servers and technologies, such as Broadcast Video Servers, Storage Area Networks, and Enterprise Tape Libraries. The installation of DIVArchive varies from site to site therefore the exact configuration of your specific DIVArchive platform is not covered in this guide. For details on your specific DIVArchive System installation and configuration, refer to your DIVArchive Delivery Plan.

The Delivery Plan is a document prepared by Oracle. (*or an affiliated system integrator*) after installation of DIVArchive at your site. It is a complete record of the configuration of the DIVArchive sub-systems and 3rd party interfaces, site details and contacts, usernames and passwords, and remote access codes.

The Delivery Plan (*for your site*) is referenced at various points in this guide, such as when usernames and passwords are required for access to the DIVArchive Software Utilities. Refer to your site's Delivery Plan where applicable.

1.2 Document Conventions

The following conventions are used with respect to text:

Normal	Standard Text.
Italic	Used to emphasize a term or variable.
Bold	Used to emphasize critical information.
6.1	Refers to a section or sub-section in the document.
`Courier New`	Used for system screen output and system commands.

The following conventions are used with respect to file paths or variables:

%DIVA_HOME%: The Root Path on the file system where DIVArchive is installed.

The following conventions are used with respect to figures and drawings:

Red outlined boxes pointing to specific areas in a figure indicate procedural steps, or point out specific parameters being discussed in the section text.

Red outlined boxes that surround specific areas in a figure indicate specific areas of the figure being discussed in the section text.

1.3 Definitions, Acronyms, and Special Terms

Table 1: Definitions, Acronyms, and Special Terms

Term	Definition
.Zip, .7z	Compression protocols that are used to compress a single file or multiple files for easy transfer as a single archived file.
Action	A pre-determined reaction of a *Metric* surpassing a *Threshold* value by one of the variables from its *internal state*. This term is used in the Oracle Storage Plan Manager (*SPM*).
AE	Archive Engine
AG	Access Gateway
AM	Archive Manager
AMC	AM Communicator
AP	Archive Provider
API	Application Programming Interface. **The DIVArchive API is compatible with DIVArchive versions 6.3 and later.**
Archive Related Operations Initiator	An entity submitting requests to DIVArchive (*typically, an automation process*).
Array	An Array designates a collection of disks designated by their name as they are declared in the DIVArchive Configuration. A Disk Name is associated with a mounting point. Archive Requests can be submitted with an array as the destination. DIVArchive is responsible for choosing the disk location to write the data when several disks belong to the same array.
Avalon	EMC Avalon Product which is being replaced by the Oracle DIVArchive / Oracle DIVAnet Solution.
AXF	The **Archive Exchange Format (*AXF*)** 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.
CAP	Cartridge Access Point: Used for inserting and removing tape cartridges to/from a Robotic Tape Library without interrupting library operations.

Term	Definition
Category	Categories are an approach to grouping an Object with other similar Objects having particular shared characteristics. It must not be confused with Medium or Array, which are storage concepts.
Checksum and Checksum Types	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.
Complex Object	An Object is defined as a Complex Object when it contains 1,000 (*configurable*) or more components. Complex Object handling may differ from non-Complex Objects as noted throughout this document.
Component	A file that is part of a DIVArchive Object.
Destination	A system on which archived objects are restored.
DET	Dynamically Extensible Transfers (*Avid protocol*).
DFM	**DIVArchive Drop Folder Manager:** monitors the Drop Folders on the system and when new files are detected, sends an archive request to the Manager. *Refer to the Oracle DIVArchive DFM User Guide in the DIVArchive Additional Features Documentation library for more details.*
DHM	Data Handling Module
DME	DIVArchive Migration Engine
DMG	DIVArchive Migration Gateway.
DPX	Digital Moving-Picture Exchange format. This 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.**
Drop Folder	Folder on a local disk, FTP Server, or a CIFS shared folder designated for Single File mode and/or File Set storage that will be monitored by DFM and from which files will be archived.

Term	Definition
Event	One operation (*such as a Request*) usually requires multiple Events to complete an operation. An Event provides all applicable information relating to the single task (*e.g. names, IDs, parameters, numbers, etc*.). Examples: • Tape Read Completed • Tape Eject Completed
Externalization	An Object Instance is ejected 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.
Facility ID	Unique 8 character alphanumeric key which is to be assigned to each DIVArchive installation starting with DIVArchive 7.0. This number cannot be changed and the DIVArchive System may not be started without a Facility ID.
FPR	File Path Root
Group	A Group is a logical notion for characterizing a set of Object Instances. This idea has a direct influence on the instance's storage policy on tapes. Instances of the same group will be stored on the same tapes. However, objects cannot have multiple instances stored on the same tape. The Group concept is based on the DIVArchive Set. Each tape inserted in the system is assigned to a Set. Groups are then associated with a single Set. Multiple groups may be associated with the same set. **Caution: No group can use the set number 0**. Several kinds of tapes can be used in a DIVArchive System. 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 mix tape types. The first case therefore specifies the tape type that is used to store the object instance.
GXF	General Exchange Format
Initiator	Refer to Archive Related Operations Initiator.
IPE	Interplay Engine
Journal	A self-maintained, automated, and configurable storage for *Events*.
MAM	Media Asset Management
MC	Media Composer

Term	Definition
MDF	Metadata File extension (***.mdf*** *– used by DFM*).
Measurement	A reading of specific information from an Event or a Resource. Examples: • Duration of a Disk Write. • Occurrence of a read error on a tape drive.
Media Format	Starting with DIVArchive version 7.0, Tapes and Disks may be formatted as either AXF or Legacy (*format used prior to 7.0*). The format is set for Tape Groups and Disk Arrays during configuration.
Medium	Set of storage resources. Currently DIVArchive provides two types of media: Groups of Tapes and Arrays of Disks. **`DIVA_archiveObject()`** and **`DIVA_copyToGroup()`** requests transfer to a Medium (*Media*).
Metadata File	A file containing information about the files included in a File Set (*used by DFM*).
Metric	An instance of one *Metric Definition* for a specific *Resource*. 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 a number of numeric values that it updates on its own 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. A metric may be *enabled* or *disabled*.
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. *Refer to the Oracle DIVArchive DIVAprotect User Guide in the DIVArchive Additional Features Documentation library for more information.*
Migration	Copying of data from a DIVArchive Media to a tape (*Archive Operation*) or from a tape to a DIVArchive Media (*Restore Operation*).
MXF	Material Exchange Format
Object	Objects are archive entries. An object is identified by a pair (*Name, Category*) and contains Components**.** A Component is the DIVArchive representation of a file. The Components are stored in DIVArchive as Object Instances.

Term	Definition
Object Instance	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 and therefore the deletion of an instance, when that instance is unique, is not permitted.
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.
Request	A Request is an operation running in DIVArchive which progresses though steps (*migration, transfer etc.*) and ends as *Completed*, *Aborted,* or *Cancelled*.
Resource	Used to denote the necessary elements involved for processing requests (*e.g. Actors, Disk, Drive, and Tape*). A resource is a uniquely identified element of the DIVArchive System made available to DIVAprotect that can be referenced by *Events* and *Metrics*. Examples: • Tape with Barcode ABE6785 • Actor Actor01 • Tape Drive Serial Number 134001021
S/D	Abbreviation for **Source/Destination**.
Oracle SAMMAsolo	A single-stream migration solution that supports a wide variety of video tape formats on input and then on-the-fly simultaneously delivers multiple digital files: frame accurate lossless preservation quality, broadcast quality mezzanine, and proxy. There are numerous formats available and Oracle SAMMA can produce different simultaneous digital output files in real-time.
Set (*of Tapes*)	Every tape in a DIVArchive System belongs to one and only one Set. If the tape is not available to DIVArchive, it belongs to Set #0, otherwise it belongs to a set with a strictly positive ID (*e.g.: Set #1*). Each group is associated with a Set. When the Group needs an additional tape, it takes it from its associated Set.
SNMP	**Simple Network Management Protocol:** Internet-standard protocol for managing devices on IP networks. Devices that typically support SNMP include routers, switches, servers, workstations, printers, modem racks, etc.
Source	A system that produces data to be archived in the DIVArchive System (*e.g.: video servers, browsing servers, remote computers, etc.*).

Term	Definition
Spanning	Splitting an Object's Component onto several tapes (*usually two*); this may occur when the component size is larger than the remaining size left on the initial tape.
SPM	Oracle Storage Plan Manager - Contact your Oracle Support Specialist for details**.**
TM	Transfer Manager
TMC	TM Communicator
Transfer	Copying data from a Source to a DIVArchive Media (*Archive Operation*) or from a DIVArchive Media to a Destination (*Restore or Oracle Partial File Restore Operation*).
UUID	Universally Unique Identifier is used to uniquely identify each object created in DIVArchive across all Oracle customer sites, except for objects created via **Copy As Requests**. An object created via a **Copy As Request** will contain the same UUID as that of the source object.
VACP	Video Archive Control Protocol
WORM	**Write-Once-Read-Many:** A WORM disc can be written to only one time but can be read from many times. The WORM Media used in the Sony Optical Drives are Blu-ray Discs.
XML	**Extensible Markup Language:** a text-based database used to allow for the easy interchange of documents and data on the World Wide Web or between software components. (***.xml***)

1.4 System Overview

DIVArchive 7.3 is capable of supporting interoperability among systems, helping to ensure long-term accessibility to valued content, and keeping up with evolving storage technologies.

Note: The File System Interface was not released with DIVArchive 7.x and is only supported by special request.

1.4.1 Oracle DIVArchive Suite 7.3 Enhancements

The following is a listing of new and updated functionality beginning with DIVArchive version 7.3:

System:

- The DIVArchive 7.3 system uses the following 64-bit Oracle Java versions:
  - Java SE Runtime Environment build 1.8.0_45-b14
  - Java HotSpot Server VM build 25.45-b02, mixed mode
- System and option licensing is no longer required and has been removed.

Oracle DIVArchive Actor:

- Beginning with DIVArchive 7.3, the Actor can read instances with a format of AXF 0.9 and AXF 1.0, but can only write to the AXF 1.0 format. DIVArchive displays the version of AXF in use by an instance.
- A transcoder does not need to be coupled to a single actor. The actor column was removed from the Transcoders panel of the Configuration Utility. This also affects Flip Factory and Vantage configurations. The transcoder server and cache location is now embedded in the working directory as follows:

  `cifs://username:password@\\transcoder_ip\transcoder_folder`

  For Vantage only, you may optionally specify a different location for the transcoder server (*Vantage SDK Service*) than the location of the transcoder cache by specifying the following in brackets before the CIFS path:

  `transcoder:<user specified address>`

  You may also optionally link a specific actor to a transcoder by specifying the following in brackets before the transcoder specification that precedes the CIFS path:

  `actor:<user specified actor name>`
- The actor configuration settings have been moved from the actor configuration and Oracle Partial File Restore configuration files to the Configuration Utility with the exception of the Service Name and Port. These settings are located under Actor Advanced and Partial Restore Settings tabs of the Actor Pane of the Systems Tab. Some settings are only available in Engineering Mode.

- Transcoding now supports load balancing based on the following behavior:
  - Empty Queue
    - A transcoder not in use is selected first.
  - Performance
    - A higher performance transcoder will be selected next.
  - Number of free queue slots available.
    - A queue with more free slots will be selected next.
- If a transcoder address is not specified in the transcoder's working directory, a local transcoder address of 127.0.0.1 will be assumed as the transcoder address.
- Oracle Partial File Restore support for QuickTime with MPEG2 LGOP (XDCAM HD 422/16 tracks of audio) has been added.
- IBM TS1150 drives are now supported.

Oracle Avid Connectivity:

- AMC has been tested and verified with Interplay 3.1.x and 3.2.
- TMC is still undergoing testing for compatibility with Interplay 3.1.x and 3.2.

Oracle DIVArchive Manager:

- In the Control GUI, the media format for an instance will be Legacy, AXF 0.9, or AXF 1.0. Tapes, Groups, and Arrays configured as AXF will remain AXF as these media can hold AXF instances of version 0.9 **or** 1.0.
- GetObjectDetailsList (*GODL*) has been redesigned to be more efficient – there are no changes to API interaction for GODL.
- Two new error codes have been created for deleting objects:
  - **`DIVA_ERR_OBJECT_BEING_ARCHIVED`** is returned when you attempt to delete an object that is in the process of being archived.
  - **`DIVA_ERR_OBJECT_IN_USE`** is returned when you attempt to delete an object that is locked for reading, such as during (*but not limited to*) restore and copy commands.
- Some commands (*such as CopyToGroup and Delete*) did not previously have an **Options** field available. An **Options** field has been added to several commands in the 7.3 releases of the DIVArchive Java API and the DIVArchive C++ API.
  - Refer to the appropriate API documentation in the DIVArchive API Documentation library for detailed information.

Configuration Utility

Prior to DIVArchive 7.3, the DIVArchive Media Mapping feature (*configurable from the Sets and Groups tab of the DIVArchive Configuration Utility*) only accepted input media values that existed in the DIVArchive database. The

mapping feature has been enhanced to allow the mapping of any input string to media/storage plan values.

LocalDelete:

LocalDelete now has two modes of operation:

- The default legacy behavior called *ASAP Purge Mode*.
  - This mode purges objects immediately after they are copied to other sites.
- The new *Delayed Purge Mode.*
  - This mode operates with watermarks in a method similar to SPM. For more information please refer to the conf files LocalDelete configuration file folder.

Migration Service:

DIVArchive now includes an embedded migration service. It is a new and separate internal (*to DIVArchive*) service which helps users to schedule and run jobs to migrate content between different media inside of a DIVArchive system. You can use the Control GUI or command line client. Contact your Oracle Support Specialist for information about the embedded migration service.

Storage Plan Manager (SPM):

- A new parameter named **`DELETE_OBJECT_ONLY_LAST_INSTANCE`** works with the existing **`ALLOW_OBJECT_DELETION`** parameter. The difference between the two parameters is that **`DELETE_OBJECT_ONLY_LAST_INSTANCE`** will only delete an object if it is truly the last instance on the system. A complete description can be found in the SPM documentation and configuration file.
- SPM now supports disk cleaning based on the object's archived date. Previously, SPM's disk cleaning feature only supports cleaning based on an object's last access time and object size.

1.4.2 DIVArchive 7.3 Configuration File Changes

There have been changes made to the configuration files included with DIVArchive for version 7.3 that coincide with the new and changed functionality. This section gives a brief overview of the changes; more details may be found in the sections specific to each component.

- The Actor configuration settings have been moved from the actor and partial file restore configuration files to the Configuration Utility.
  - The only remaining parameters in **`actor.conf`** are the Service Name and Port.

- The Flip Factory configuration file now allows users to specify a remote host using the **`flipFactory.host`** parameter added to the **`ffsubmitter.properties.ini`**.

2 DIVArchive Concepts

2.1 Objects

Each asset that is archived to DIVArchive is called an **object**.

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

An object is uniquely identified in DIVArchive by its **name** and **category**. The Object Name does not necessarily need to match that of the source file being archived. DIVArchive will always restore the archived files as they were archived, regardless of the DIVArchive Object Name. The same source file can therefore be archived more than once in the same category, as long the Object Name used for each is different.

Once an object exists within DIVArchive, it cannot be replaced unless it is first deleted. If an archive request uses the same name and category of an existing object, DIVArchive will automatically abort the request. However, multiple copies or **instances** of an object can be created once the asset is archived.

If a source asset is to be stored in a variety of encoding formats (*e.g. MPEG2 Long GOP, DV50 or Low Resolution Proxies*), specific categories can be used to archive the same object based on its encoding format.

Figure 1: DIVArchive Object Concepts

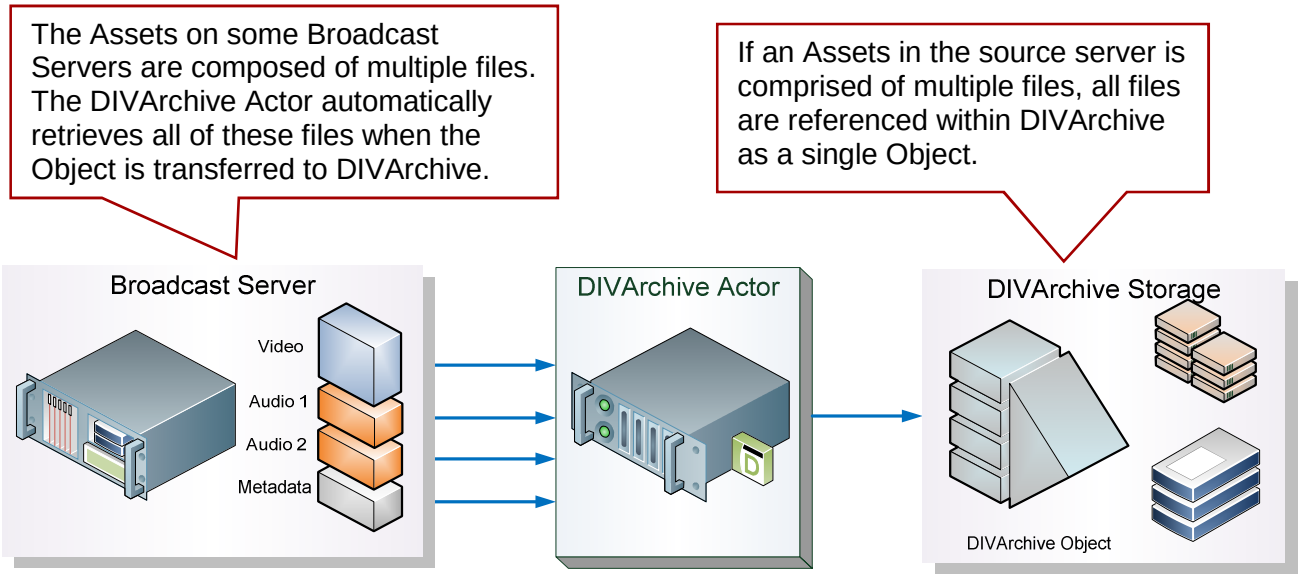
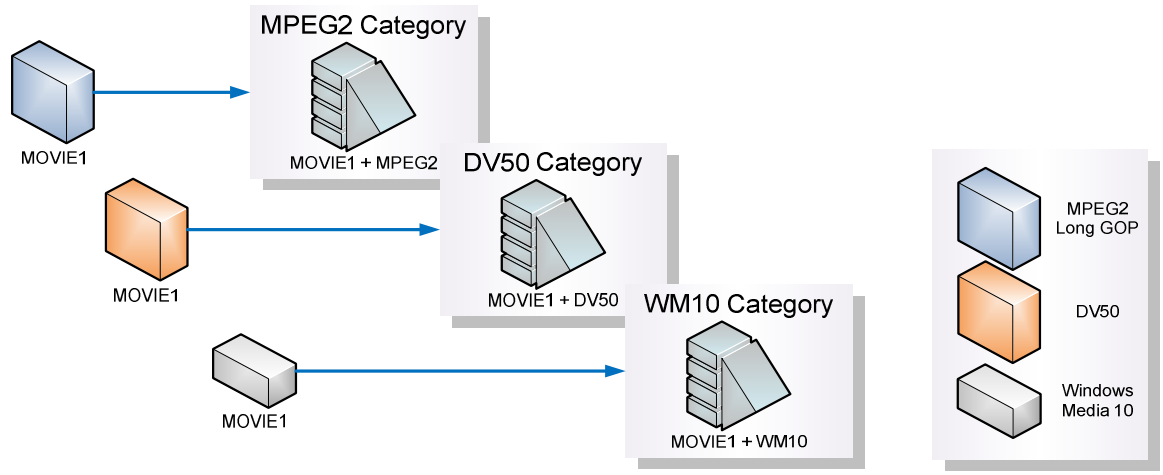


Figure 2: DIVArchive Category Concepts



2.2 Complex Objects

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

When an object is archived, DIVArchive determines whether the new object should be complex or non-complex based on its number of components (*files*). If the number of components is greater than 1,000 (*the default Complex Object threshold – see below on how to change this*), the object becomes a Complex Object; otherwise, the object is non-complex. Once an object is deemed a Complex Object, it will always be complex – even if it is copied using the **Copy As** command, or imported using the Import/Export Utility.

2.2.1 Complex vs. Non-Complex Objects in DIVArchive

A Complex Object differs from a non-Complex Object in some key ways. For instance, the file and folder metadata information of a Complex Object is stored in a file, not in the Oracle database. The file contains the filenames, folder names, checksums, and files sizes. The directory that contains these files is the Metadata Database Root Directory (*see below on how to configure this*). As previously stated, a Complex Object must be stored in *AXF* format – either on tape or on disk.

Because a Complex Object can contain hundreds of thousands of files, in the DIVArchive Control GUI the entire set of files on a tape are not displayed in the **Object Properties** and **Tapes** dialogs – a single placeholder "file" is shown.

Not all DIVArchive operations are supported for Complex Objects. For instance, the *Delete on Source* feature is disabled for Complex Objects. The checksum features *Verify on Archive* and *Verify on Restore* are also disabled for Complex Objects. Oracle DIVAnet does not currently support replication of Complex Objects.

Certain DIVArchive API operations used in Avid Connectivity (*such as* ***`GetByFilename`*** *and* ***`DeleteByFilename`***) are not currently supported for Complex Objects.

A Complex Object maintains information about files in the archive as well as the folders. Complex Objects store subtotals for each folder, including the total number of files/subdirectories within the folder, as well as the total size of all files within the folder (*and within any subfolders*).

The *Complex Object Threshold* is a configurable parameter used by DIVArchive to determine whether a new object should be complex or not. If a new object has a number of components (*files*) that exceeds the threshold, the object automatically becomes a Complex Object. This value is set in the **`manager.conf`** configuration file. It is recommended that the threshold remains at the default value (*1,000 components*) unless there is a specific reason to adjust the value.

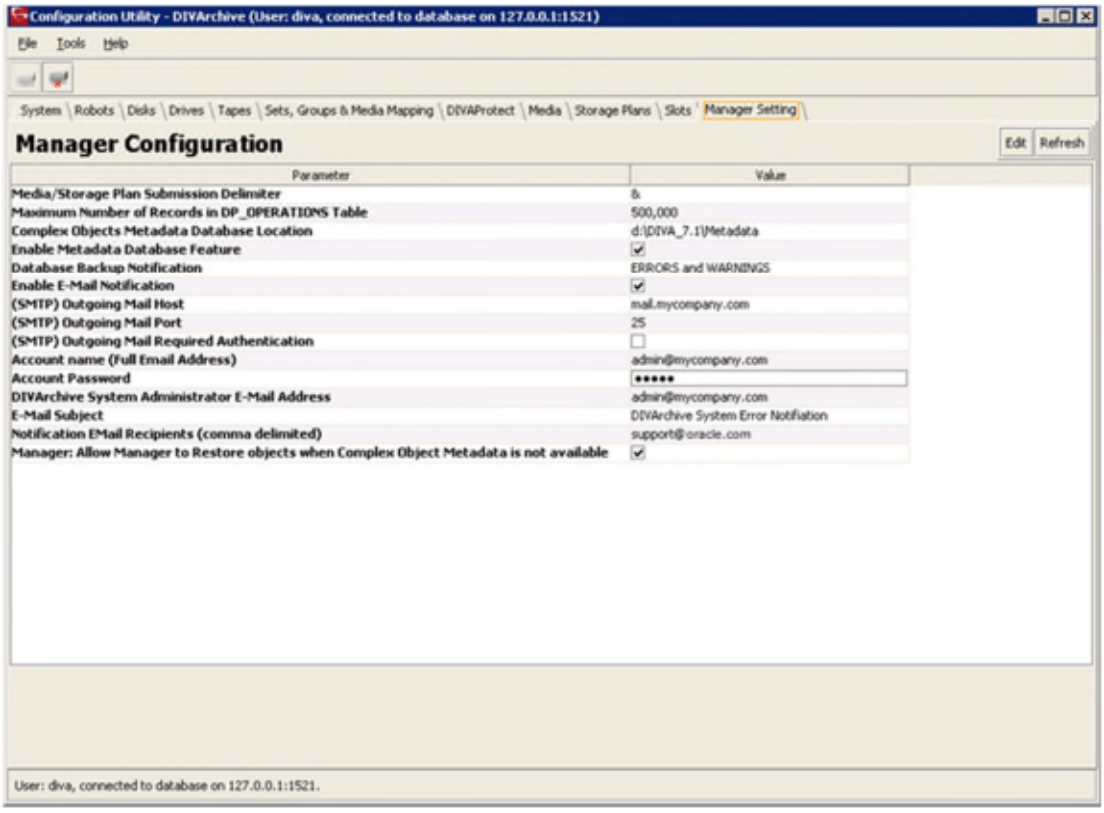
2.2.2 DIVArchive Metadata Database

To be able to effectively operate with large volumes of files/folders and other metadata, DIVArchive stores this metadata separately from the Oracle database in what is called the DIVArchive Metadata Database. The DIVArchive Metadata Database contains files stored in a file system local to the DIVArchive Manager. The directory that contains these files is the *Metadata Database Root Folder*.

The DIVArchive Metadata Database has a very high performance, almost unlimited scalability. The Metadata Database should be treated with the same caution as the Oracle database; it should be backed up at regular intervals via the DIVArchive Backup Service.

The figure below shows the Configuration Utility / Manager Settings Tab with additional parameters to be set for the Metadata Database.

Figure 3: Configuration Utility – Manager Settings Tab



2.2.3 Complex Objects and FTP

When archiving Complex Objects via FTP protocol and using Filezilla with default settings, the transfer will typically fail when archiving any object with more than approximately 3900 files. There are two reasons for this possible failure:

- Actor connection timeouts.
    - The Actor connection times out before the size of the object can be computed.
- Filezilla is using all available sockets.
    - A request aborts in the middle of the transfer because the FTP Server (*Filezilla, etc.*) is consuming all of the available sockets.

Actor connection timeouts can be resolved by setting the following two parameters either in the **Source/Destination Command Options**, or in the options of the command itself:

- **`-transfer_timeout 1200`**
- **`-list_timeout 600`**

Note: For more information on these parameters, contact your Oracle Support Specialist.

It is also recommended to set the corresponding parameters in the **Filezilla Server** under the **General Settings**:

- **`Connections Timeout = 600`**
- **`No Transfer Timeout = 1200 (default)`**

In the event of an abort, which may occur during transfer, there are two registry parameters that need to be created or modified (*typically created*):

- **`TcpTimedWaitDelay = 10`**
- **`MaxUserPort = 90000`**

Note: The Oracle Support Department should be contacted to make FTP Server and machine Registry changes if no qualified personnel are on site.

2.2.4 DIVAnet Complex Object WAN Transfer

DIVArchive 7.3 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 is capable of performing transfers of Complex Objects efficiently using the DataExpedition MTP/IP protocol.

Example:

A Complex Object exists on the local DIVArchive System (*DIVA1*) and needs to be transferred to a remote DIVArchive System (*DIVA2*). For this example the DataExpedition Server is used, however it will work with Aspera, etc. as well.

The process is as follows:

1. DIVA1 restores the Complex Object to the DIVA2 System by first creating a new AXF file on the DIVA2 System's DataExpedition Server.

2. DIVA1 restores all of the files from the local storage to the new AXF file that was created on the DIVA2 DataExpedition Server.
3. The DIVA2 System creates a new AXF file on the destination (*Tape, Disk, etc.*).
4. The DIVA2 System archives all of the files from the DataExpedition AXF file (*created by DIVA1 on the DataExpedition Server*) to the newly created AXF file on the destination.

Contact your Oracle Support Specialist for assistance with DIVAnet.

2.3 Media Storage Formats

2.3.1 AXF Disk and Tape Storage Format

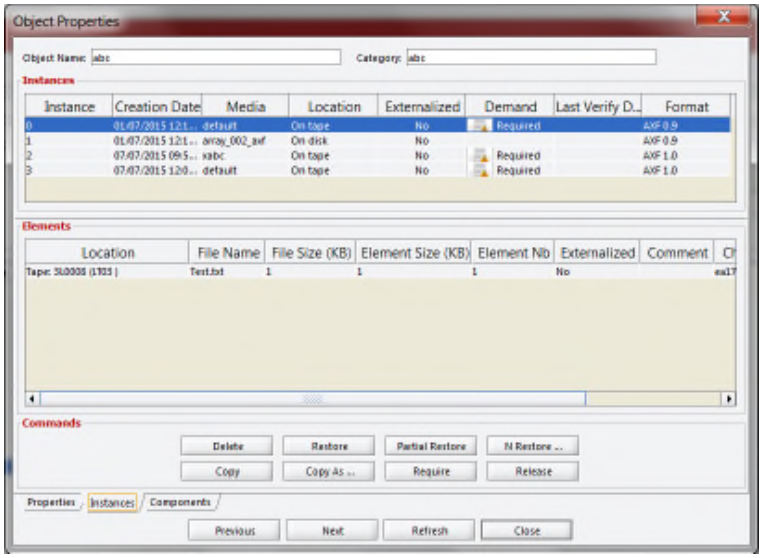
Archive Exchange Format (*AXF*) is an open format that supports interoperability among disparate content storage systems and ensures the content's long-term availability no matter how storage or file system technology evolves.

An AXF Object is an IT-centric file container that can encapsulate any number, and any type, of files in a fully self-contained and self-describing package. The encapsulated package contains its own internal file system, which shields your valuable data from the underlying operating system and storage technology. **It's like a file system within a file that can store any type of data on any type of storage media.**

2.3.1.1 AXF Version Identification

Actor can read instances with a format of AXF 0.9 and AXF 1.0, but can only write to the AXF 1.0 format. DIVArchive displays the version of AXF in use by an instance. In the Control GUI, the media format for an instance will be Legacy, AXF 0.9, or AXF 1.0. Tapes, Groups, and Arrays configured as AXF will remain AXF as these media can hold AXF instances of version 0.9 **or** 1.0.

Figure 4: Object Properties



2.3.2 Storage Media Format

In DIVArchive, 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 DIVArchive *Legacy* format or the newly introduced *AXF* format. This setting can be changed at any time and does not influence content already stored. This means that it is possible to have more than one Storage Media Format within Tape Groups and Disk Arrays.

A DIVArchive Object Instance is written in one and only one Media Format. Therefore, if an object spans tapes, each tape used as part of an object instance will be written in the same Media Format. In DIVArchive 7.3, an Object can contain multiple instances, each of which can be stored in either *Legacy* or *AXF* format.

Complex Objects, introduced in DIVArchive 7.0, must be stored in AXF format. As all Complex Objects are written in the AXF format, every instance of a Complex Object will be in the AXF format.

2.3.3 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.** The Media Format for an empty tape is assigned when the first Object on that tape is written. The tape is assigned the format of the Tape Group that appears in the request. Once the Media Format for a tape is assigned, it cannot be changed unless all objects on the tape are deleted. Upon deletion of all objects from a tape, the tape's format becomes unassigned until content is once again written to the tape.

If the tape was in use, the tape format cannot change unless it is empty and cleared.

Both *Legacy* and *AXF* formatted tapes can exist in the same group. Nevertheless, objects in *AXF* format will only be written to *AXF* formatted tapes, and objects in *Legacy* format will only be written to *Legacy* formatted tapes even though they are in the same Tape Group.

In the current version of DIVArchive, a Repack Request will always write the destination tape in the same Media Format as the source tape.

Similar to this, **Tape Spanning operations will always use the same format across all tapes storing spanned Objects.** If an instance spans across multiple tapes, then all tapes used to span the content will have the same format.

2.3.4 Disk Storage Media Format

Unlike tapes, disks **do not** have a format. **DIVArchive allows storing Objects in different Media Formats on the same disk.** If a disk contains objects in *Legacy* format and that disk is then assigned to an *AXF* formatted array, it will still contain Objects in *Legacy* format. However, new objects written to the disk will be in *AXF* format.

2.3.5 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.

The format of a tape instance is the format of the tape on which the instance resides. All instances on a tape must have the same format.

If a disk instance is non-complex and permanent (*not a cache instance*), it is stored in the format of the destination array. If a cache instance is non-complex, it is stored in the format of the group specified in the request.

Groups or Arrays used by Complex Object requests must be in an *AXF* format, as Complex Objects cannot be stored in *Legacy* format. As all Complex Objects are written in the *AXF* format, any instance of a Complex Object will be in the *AXF* format.

To migrate Objects from *Legacy* Media Format to *AXF* Media Format (*or back*), the Copy To Group, or Copy As New requests can be used. However some *AXF* Objects cannot be copied to the *Legacy* format; copying objects from *Legacy* format to *AXF* format does not present any issues. In DIVArchive 7.3 the only limitation on copying an Object Instance from *AXF* to *Legacy* format is the Complex Object feature.

2.4 Requests

A **Request** is a command that is issued to DIVArchive to perform an operation. The most common request types are for transferring content to the archive (*referred to as an Archive Request*), or transferring content out of the archive (*referred to as a Restore or Partial File Restore Request*).

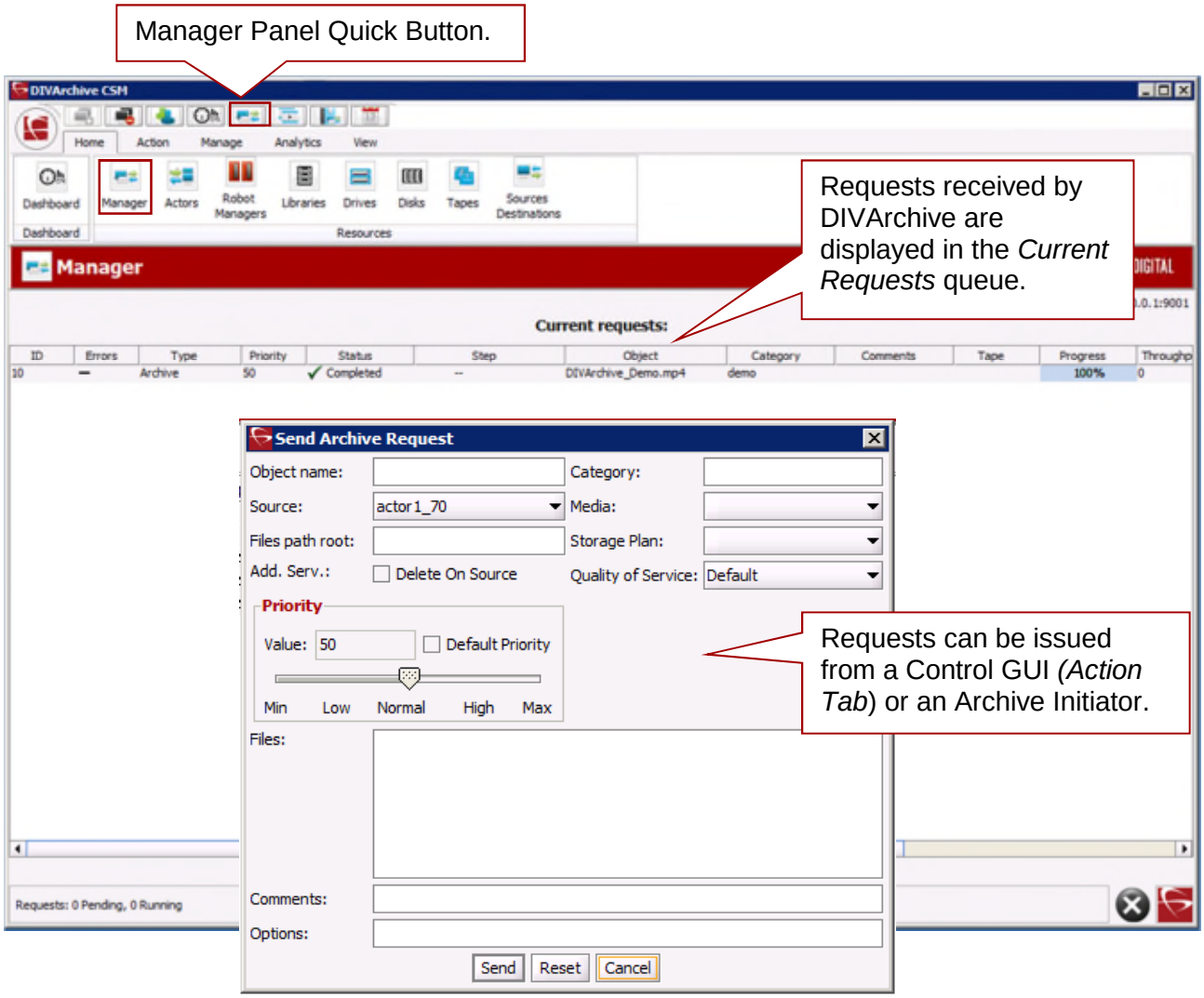
Other request types deal with managing the objects within the archive once they have been created. Examples of other request types are **Copy**, **Delete**, and **Repack Tape** requests.

All requests are submitted to DIVArchive from a DIVArchive Client Application. This could be either from one or more attached Control GUI's, or via the DIVArchive Client API from a 3rd party archive initiator (*such as an Automation System*).

Each request is automatically given a unique identifier by DIVArchive (*called the **Request ID***), which can be later used to retrieve **Event Logs** or other properties of each request. DIVArchive stores the records of up to 50,000 requests in its database.

Since multiple requests may be received simultaneously by DIVArchive, they are all placed into a queue and are executed on a first come, first served basis. The execution order of requests can be prioritized using the **Request Priority** parameter. The queue of requests that are currently being processed by DIVArchive can be displayed in the **Current Requests** frame of the **Manager View** in the **Control GUI**.

Figure 5: Send Archive Request



2.5 Sources and Destinations

A **Source** is defined as any connected system that has content intended to be transferred *to* DIVArchive, and a **Destination** is defined as any connected system that requires content to be transferred to it *from* DIVArchive. Examples of both are Broadcast Video Servers, FTP Servers, or Disk Storage.

The sources and destinations that are used in DIVArchive requests are pre-defined in the DIVArchive configuration and are accessible by the **Sources Destinations Button** in the **Home Tab**. In DIVArchive's Source/Destination configuration, each server type or disk file system is given a unique name and each one can be configured as:

- A **Source** only.
  - DIVArchive will only archive files from the server or disk file system.
- A **Destination** only.
  - DIVArchive will only restore files to the server or disk file system.
- Both a **Source** and a **Destination**.
  - DIVArchive 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 is beyond the scope of this guide, a brief overview of the configuration is included since they can influence how requests are issued to them, and influence how two or more simultaneous requests to them are managed in the Current Requests Queue.

Generally, each source and destination has the following parameters configured. These are common to all requests that involve that source and/or destination:

- The **Source Type** is the protocol or access method to be 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 requests that DIVArchive will execute concurrently on the target device, or prioritizing write (*restore*) operations over read (*archive*) operations.
- Define the maximum bandwidth allowable to DIVArchive for transfers to or from the device. This may be used to throttle data transfers where the target device is shared with other Production Systems or 3rd party applications.
- The **Default Quality of Service** (*QOS*). This is the QOS that is used when **Default** is specified in a request'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 sub-folders, usernames or passwords, or other options specific to the selected **Source Type**. If no options are specified, this parameter is ignored.

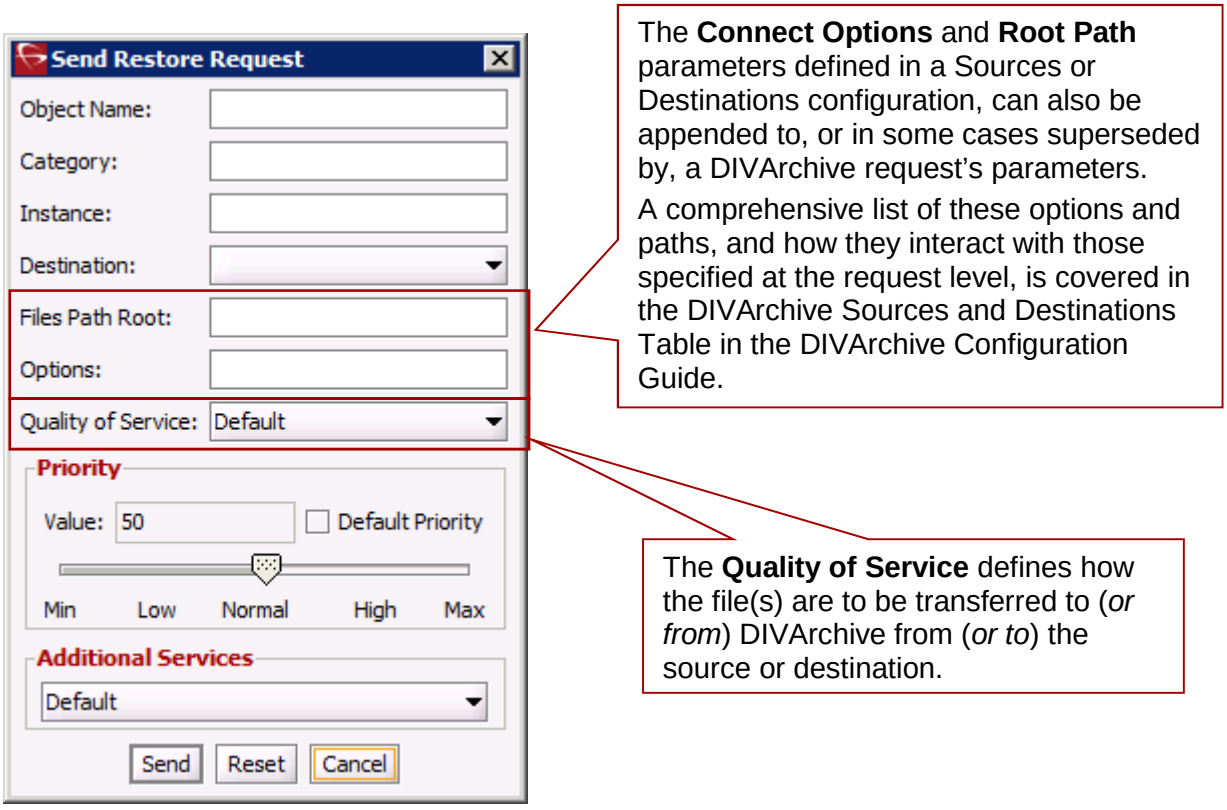
- The **Root Path** to the files to be archived on the source, or restored to on a destination. This is always specified as an **absolute** directory path on the target device (*e.g.* ***`c:\Exported\MPEG2`*** *for Windows based file systems, or* ***`/Movies/MPEG2`*** *on UNIX based file systems*). The **Root Path** configuration also depends on the **Source Type**, and may be left blank in some cases (*and will be ignored by DIVArchive*).

  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 Source/Destination configuration, they may not be appropriate for every request submitted. DIVArchive therefore allows these parameters to be specified in a DIVArchive Request to that source or destination (*at the request level*). Whether or not a request can override these Source/Destination attributes depends on the **Source Type**.

The **Files Path Root** specified in a request can either be appended to the **Root Path** specified in the Source/Destination configuration, or override the **Root Path** entirely if it is specified as an absolute path.

Figure 6: Send Restore Request Window



2.5.1 DIVArchive Data Expedition Integration

DIVArchive can (*optionally*) interface with the Source/Destination named **DataExpedition Expedat Source/Destination Server**. The **Expedat Server** (*also known as servedat*) is very similar to the DIVArchive **FTP_STANDARD Server** and **CIFS** and offers AES Encryption capabilities. The main difference amongst them is the protocol used for operations.

The **Expedat Client API** is integrated into the Actor Machine and the **Expedat Server** is integrated into DIVArchive (*either on an Actor Machine or other additional server within the system*) just like the **FTP_STANDARD Server** and **CIFS**, but is faster when used on high latency networks when using the **DataExpedition Expedat MTP Protocol** (*a high performance file transfer protocol*), which allows for better bandwidth utilization.

One record is created for each Expedat Server that DIVArchive has to move data to or from and although the initial solution for DIVAnet transfer and restore is still functional in DIVArchive 7.3, the functionality has been enhanced and now includes Complex Objects. With the new functionality, there are only 2 steps required for archiving objects through DIVAnet instead of 3 steps as previously required.

Contact your Oracle Support Specialist for more assistance.

2.5.1.1 Source/Destination Configuration

One record is created for each Expedat Server that DIVArchive must move data from/to.

Table 2: Source Destination Configuration

Attribute	Value	Example
IP Address	IP Address of the Expedat Server.	10.80.114.21
Source Type	EXPEDAT	EXPEDAT
Connection Options	**`-login`** *username* **`-pass`** *password* **`-port`** *portNumber* **`-license`** *licenseCode* **`-encryption`** **`-seq_buffer_size <Mbytes>`** **`-exp_maxrate <Kbytes>`** **`-exp_mindatagram <Bytes>`**	**`-login`** *moon* **`-pass`** *ph4!hi4* **`-port`** *8080* **`-license`** *46FE464A98* -encryption -seq_buffer_size 16 -exp_maxrate 1024 -exp_mindatagram 2848

Table Notes:

- **`-login`** and **`–pass`** are mandatory if the server is configured with authentication parameters.
- **`-port`** should be present since there is no default value.
- **`-license`** is mandatory and is the Expedat license number.

- **`-encryption`** is optional.
- **`-seq_buffer_size <Mbytes>`**
  - Defines the size of the DataExpedition internal buffer for each transfer. The default value is 16MB and should be sufficient for most transfers. A large buffer allows DataExpedition to continue moving data during times when the sender or receiver may not be able to process it. A small buffer will consume less memory.
- **`-exp_maxrate <Kbytes>`**
  - This option sets an approximate limit on the number of kilobytes per second, per transfer. The default is unlimited but can be used as an alternate method of controlling bandwidth.
- **`-exp_mindatagram <Bytes>`**
  - This transfer protocol is over UDP. This option can define a minimum size for each network datagram payload that DataExpedition will send. The purpose is to prevent DataExpedition from sending too small of a packet over the network. Users may wish to set this value between 2848 and 8544 when using a very fast network path (*Gigabit or later*) and every device along the path supports Jumbo Frames (*MTU 9000*). Using large datagrams may greatly reduce CPU overhead; however use of this setting **without** Jumbo Frames being fully supported may cause severe performance issues or loss of connectivity.

2.6 Metasource

The **Metasource Source Type** allows a number of currently defined DIVArchive Source/Destinations which share the same online storage (*or monitor the same folder or FTP Server for Drop Folder Monitors*) to be combined and considered as a single DIVArchive Source/Destination configuration. This unique (*and optional*) feature allows DIVArchive to provide automatic load balancing and failover capabilities in case of one or more of the individual Source/Destinations going offline.

When requests are issued to DIVArchive with a Source/Destination using the Metasource source type;

- Each additional archive or restore request will use the next server in the Metasource list to that what was used in the last request.
- If the server selected by DIVArchive is offline or encounters an error, the next server in the Metasource list will be automatically retried. If all servers fail to fulfill the transfer, the request will be aborted.

2.7 Arrays, Disks, and Cache

DIVArchive uses Hard Disk Drive (*HDD*) technologies for both the storage of DIVArchive objects and for transient storage during data transfers (*commonly known as disk cache)*.

Any disk that is used by DIVArchive is assigned to an **Array**. An **Array** is a logical association of one or more disks for the storage of DIVArchive Objects. Disks that are configured as cache disks (*i.e. for temporary storage*) are also assigned to an **Array**, typically called **CACHE**. These concepts are illustrated in the figure below.

The storage of an object on a disk in DIVArchive is associated by the Array's Name rather than an individual disk itself. The allocation of objects amongst two or more disks within any Array is performed automatically by DIVArchive.

Each disk in any Array may be connected to a DIVArchive system either:

- Directly in an Actor host's hardware.
- As Network Attached Storage (*NAS*).
- Connected via a Storage Area Network (*SAN*) using Fibre Channel. This case may also employ additional file system sharing software on the hosts if the disk is to be accessed simultaneously from multiple Actors.

Additionally, individual disks in an Array may be configured as:

Table 3: Array Disk Configuration Types

Type	Description
Storage Only	The disk will be only used for storage of DIVArchive objects. These types of disks will employ some sort of RAID technology to ensure data redundancy and protection against individual hard disk failure.
Storage and Cache	The disk will be used for the storage of DIVArchive objects, and also for caching operations. Both types will use separate sub-folders on the disk. These types of disks will employ some sort of RAID technology to ensure data redundancy and protection against individual hard disk failure.
Cache Only	The disk will only be used for caching, tape to tape copying, tape spanning, or tape repacking operations. These types of disks may employ RAID technology to improve performance (e.g. RAID 0).
Storage and Nearline	The disk will be used for the storage of DIVArchive objects, and also for Nearline operations. Both types will use the same sub-folder on the disk. These types of disks will employ some sort of RAID technology to ensure data redundancy and protection against individual hard disk failure.

Type	Description
Cache and Storage and Nearline	The disk will be used for the storage of DIVArchive Objects, and also for caching and Nearline operations. Both storage and Nearline types will use the same sub-folder on the disk. However, the cache type will use a separate sub-folder on the disk. These types of disks will employ some sort of RAID technology to ensure data redundancy and protection against individual hard disk failure.

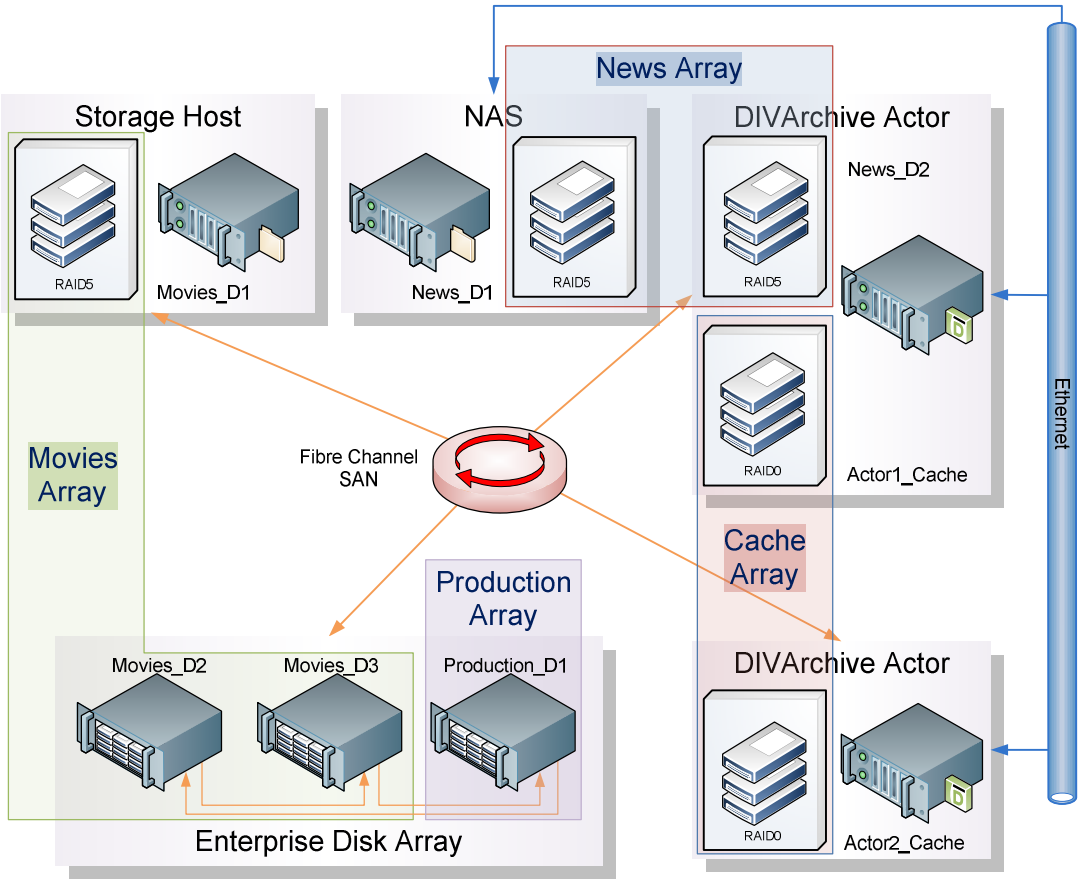
DIVArchive also allows individual disks to be configured for Read/Write access, Read-Only access, or to be disabled temporarily.

Note: The file system of any DIVArchive managed disk should *never* be manipulated directly by any file manager or utility (*such as Windows Explorer*) or equivalent. If the folder structures or files are moved, renamed or deleted, this will likely cause DIVArchive to mark that disk as *Out of Order*.

Additionally, disks that have file sharing software installed to provide shared host access (*such as SNFS or MetaSAN*) may appear as an unknown file system or as not initialized to utilities such as Windows Disk Manager.

WARNING: Using such a utility in any fashion will completely destroy the file system on that disk.

Figure 7: Sample Arrays, Disks, and Cache Configuration



2.8 Quality of Service

The Quality of Service (*QOS*) parameter defines how a file is to be transferred to/from a DIVArchive tape, from a source, or to a destination. The options for QOS are defined as follows:

Table 4: Quality of Service Definitions

Type	Definition
Direct Only	The data is transferred immediately to the source as it is being read from tape. Alternately, the data is written to tape immediately as it is being transferred from a destination. If no direct transfer service is available, the request will be aborted.
Cache Only	The data is first transferred entirely to cache storage from tape, and then transferred to the destination. Alternately, the data is first transferred entirely from the source to cache storage, and then written to tape. If no cache service is available, the request will be aborted.
Nearline Only (***only for Restore and N-restore***)	If a Nearline (*disk*) instance exists, the data is transferred from Nearline disk to the destination. Alternatively, the data is first transferred entirely to Nearline storage on disk from tape, and then transferred to the destination. If no Nearline service is available, the request will be aborted.
Direct and Cache	If a direct transfer is not available (*e.g. no Actor with direct transfer enabled is available*), then cache transfer will be used instead.
Cache and Direct	If cache transfer is not available (*e.g. no Actor with cache storage is available*), a direct transfer will be performed instead.
Nearline and Direct (***only for Restore and N-restore***)	If Nearline transfer is not available (*e.g. no Actor with Nearline storage is available*), a direct transfer will be performed instead.
Default	The QOS specified in the source or destination's configuration will be used.

If an object to be restored has both disk and tape instances, and **Cache Only,** or **Cache and Direct QOS** is used, DIVArchive may restore the tape instance as first priority over the disk instance. This behavior is dependent upon the **`DIVAMANAGER_CACHE_QOS_USE_DISK`** in the DIVArchive Manager configuration. If set to **`true`**, DIVArchive will restore the disk instance regardless of the QOS specified.

Note: The Cache transfer method is particularly important for optimum use of DIVArchive resources when the transfer speeds between tape devices and the Source/Destination vary considerably. For example, if the tape drive in the request can write data at 400Mb/s, but the source can only deliver the data at 100Mb/s, the tape drive will never achieve its optimum transfer rate. By using the Cache QOS, the file can be completely transferred to cache, and the drive can complete its write operation at its maximum speed, and therefore can be used for other requests in a shorter period of time, compared to the same transfer using the Direct QOS.

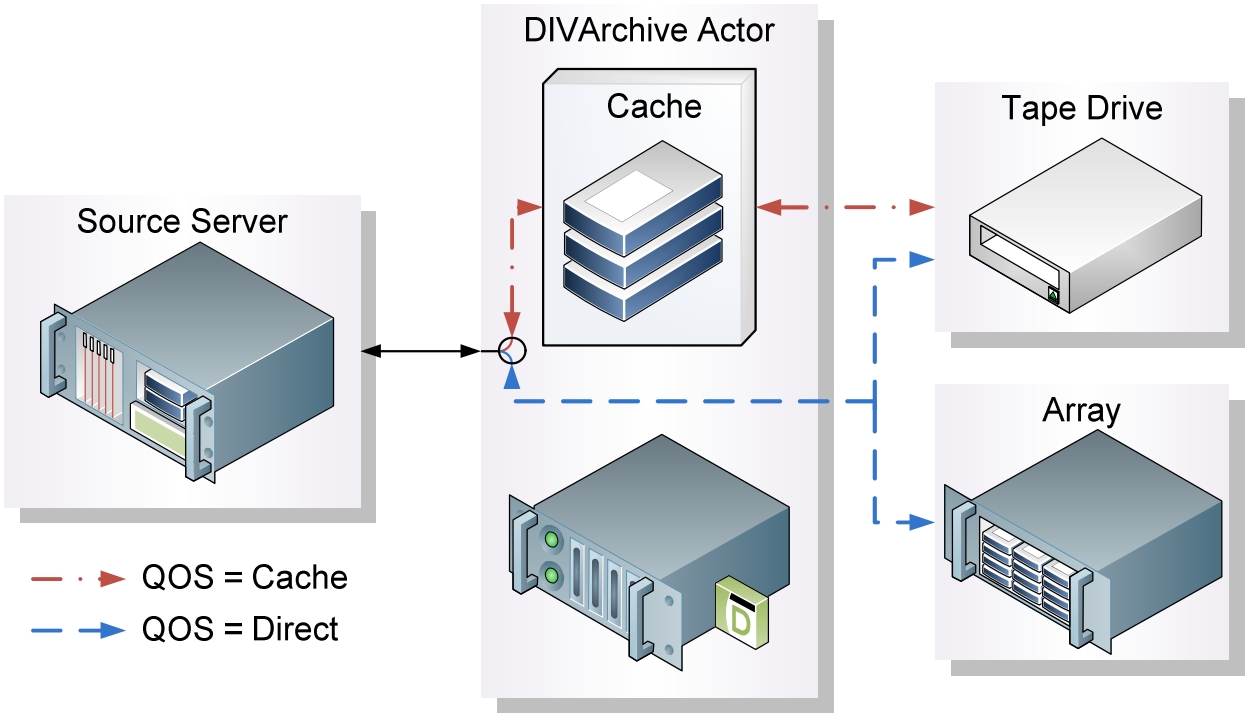
If an object to be restored has only tape instances, the **Nearline Only**, or **Nearline and Direct QOS** will attempt to create a permanent disk instance and restore from that instance. Every subsequent Nearline restore for the same object will be blocked, waiting for the first restore to create a disk instance. If the first restore fails to create a disk instance, the process repeats with the next restore attempting to create a disk instance. All other restores are blocked until that instance has been created.

If an object to be restored has a disk instance, the **Nearline Only**, or **Nearline and Direct QOS** will restore from that instance.

The default QOS for Restore and N-Restore requests is Nearline and Direct.

Note: If the restore request is a Transcode Restore, or if the destination server is a Movie2Me server, the Manager will switch the restore QOS to *Direct Only*. Other QOS types are not supported in this case.

Figure 8: Quality of Service Workflow



2.9 Tape Groups and Sets

Just as disks are logically assigned to Arrays for the storage of DIVArchive Objects, tapes are logically associated together in **Groups**.

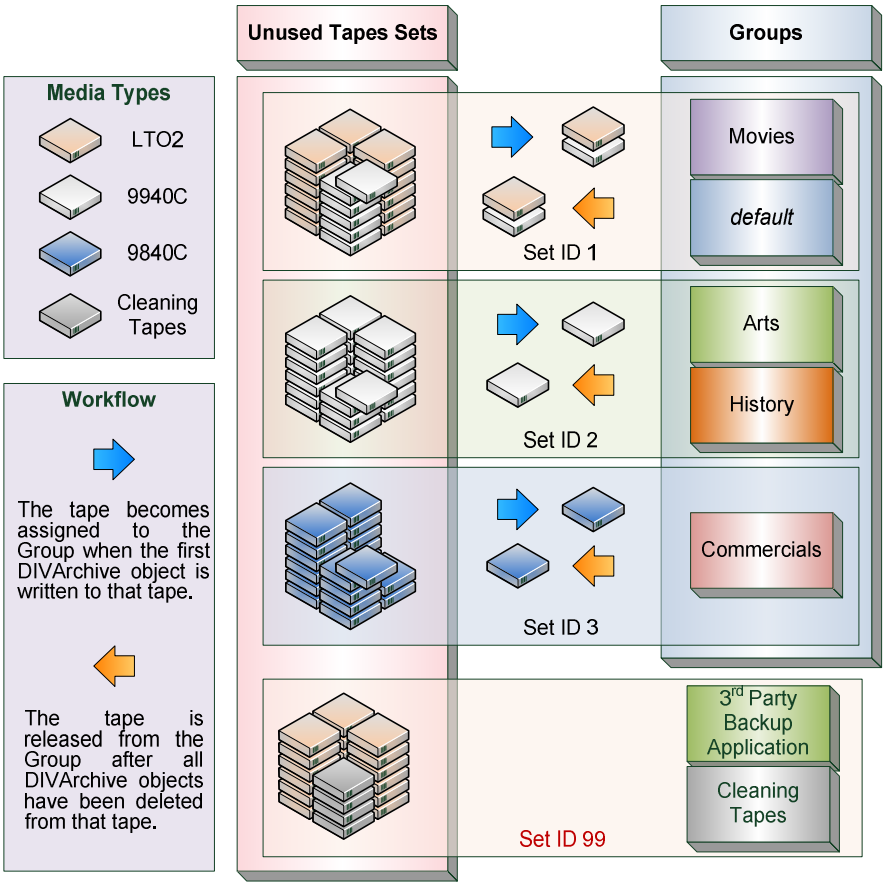
Tapes are initially divided into **Sets**, and assigned a number called a **Set ID**. Set ID's allow you to partition pools of tapes in a library and assign them for use with specific DIVArchive Groups. A Group draws upon those pools by associating the group with a Set ID.

More than one group may use the same Set ID; an unused tape will not actually belong to any of those groups until the first DIVArchive Object is written to that tape. Additionally, when all objects have been deleted from a group assigned tape, it will be unassigned from that group, and may subsequently be assigned to another group using the same Set ID. The figure below demonstrates this.

Since groups are a user-defined concept, they can differ from one DIVArchive installation to another. The exception is the **Default Group**; this exists in all installations and can neither be renamed nor removed. In a DIVArchive System, groups are created and managed in the Configuration Utility's **Sets, Groups & Media Mapping Tab**.

When a tape is assigned a Set ID of 99, this indicates to DIVArchive that it is not to be used, and is not related to the operation of DIVArchive. Examples are tapes that belong to a non-DIVArchive application in a shared library environment or the library's cleaning tapes.

Figure 9: Groups and Sets



2.9.1 Sony ODA Drives

Sony ODA ODS-D55U and ODS-D77F Drives are supported by DIVArchive starting with version 7.2. These are Blu-ray Optical Drives and the media is WORM (*Write-Once-Read-Many*) media using a UDS format, and only AXF formatted objects may be written to the discs. The drives are controlled by the Robot Manager and the media is viewed as a Tape Cartridge.

In the Windows Device Manager these drives will be shown as **Unknown Medium Changer** under the **Medium Changer devices** section since there are no device drivers for them. The drive itself will also appear as an **Optical SCSI Device** with the make and model number under the **Disk Drives** section.

There are six different types of disc media available for use with the Sony Optical Drives:

- SONY-ODC300R
- SONY-ODC300RE
- SONY-ODC600R
- SONY-ODC600RE
- SONY-ODC1200RE
- SONY-ODC1500R

2.9.1.1 Additional Information

Additional information related to the use of the Optical Drives and Discs:

- Within the DIVArchive Control GUI the Optical Discs are displayed under the **Drives Tab**.
- Because Write-Once Media must be finalized, zero remaining space will be reported to the Manager.
- Objects are spanned when there is 100mb remaining so that there is enough space left to finalize the disc. Once an object is spanned, the disc is considered full and is automatically finalized.
- The Actor will auto-finalize the discs when there is 500mb of space remaining (*unless an object was spanned*); however it can be achieved manually through the Optical Disc Archive Utility.
- If a drive is manually mounted and viewed in the Windows Explorer, the numeric value at the beginning of each object's filename identifies the object's location on the tape.

2.9.2 Tape Spanning

When the capacity of a Tape Group begins to reach full capacity (*i.e. the group's associated Set ID has no more blank tapes on which to draw upon*), DIVArchive may attempt to maximize the storage utilization of the existing tapes in the group by filling the remaining free space of each tape by segmenting the object across two or more tapes. This is known as **tape spanning**.

The tape spanning feature is by default configured (*in the DIVArchive Manager Configuration file*) to span across two tapes only. If an object cannot be spanned across

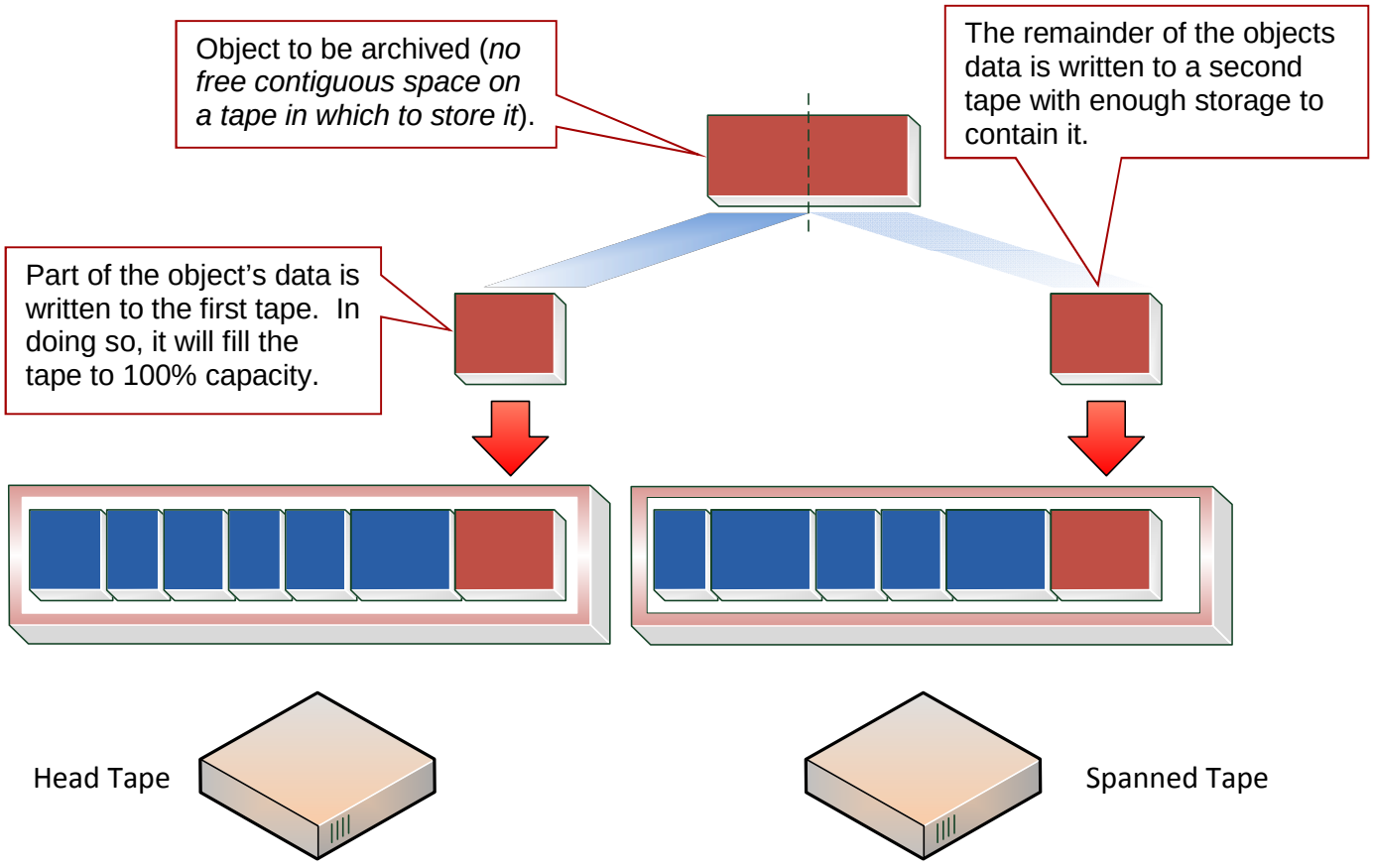
the remaining free space of two tapes within that group, the request will be aborted by DIVArchive. Tape spanning may be set to span across more than 2 tapes at your site, or disabled altogether (*refer to your DIVArchive Delivery Plan for the setting at your particular site*).

During the restore of a spanned object, DIVArchive will mount all associated spanned tapes and join the spanned object back together automatically. It cannot do this directly, but must copy all segments of the spanned file to a cache disk first. Therefore, restoring a spanned object must use a **Cache Only** or **Cache and Direct** Quality of Service; a Direct QOS will result in the request being aborted.

For Write-Once Media, objects are spanned when there is 100mb is remaining so that there is space left and the disc may be finalized. Once an object is spanned, the disc is considered full and is automatically finalized.

Note: Tape spanning is not compatible with the Associative Copy function.

Figure 10: Sample of Tape Spanning



2.9.3 Protected Mode

When a tape is ejected from the library, it is automatically set to **Protected Mode**. When this attribute is set, it prevents further archive operations from being performed on this tape and prevents the tape from being repacked.

DIVArchive assumes that a previously ejected tape is re-inserted into a library in order to perform a restore operation, and will then be subsequently ejected and put back into offline storage. If not for the Protected Mode feature, new DIVArchive objects may get written to the tape while it is temporarily in the library, thus preventing it from being ejected without first moving these *required* objects to another tape.

No write operation on a protected tape is allowed unless the protected attribute is set back to **`false`** in the DIVArchive Configuration Utility after the tape is re-inserted to the library. This attribute does not prevent deletion operations on instances located on these tapes (*whether internalized or externalized*).

You may also need to reset this attribute on a tape if:

- The tape was ejected from a library in error.
- The tape was stuck in a tape drive and removed by opening the library door and manually ejected from the library. When the library is then re-synchronized with the DIVArchive Database, the missing tape will be deemed externalized, and set to Protected Mode.

2.9.4 Tape Label Management

When a tape is first mounted and objects written to it by DIVArchive, a **Label** is written to the beginning of that tape. This label contains important information relating to the management of objects written to or deleted from the tape during archive operations. From an operational perspective, the most important information in the tape label is that of the **Barcode Number** of that tape. The Barcode Number is an alphanumeric number on the physical label adhered to the back of the cartridge and is also written to the label on the magnetic media of the tape.

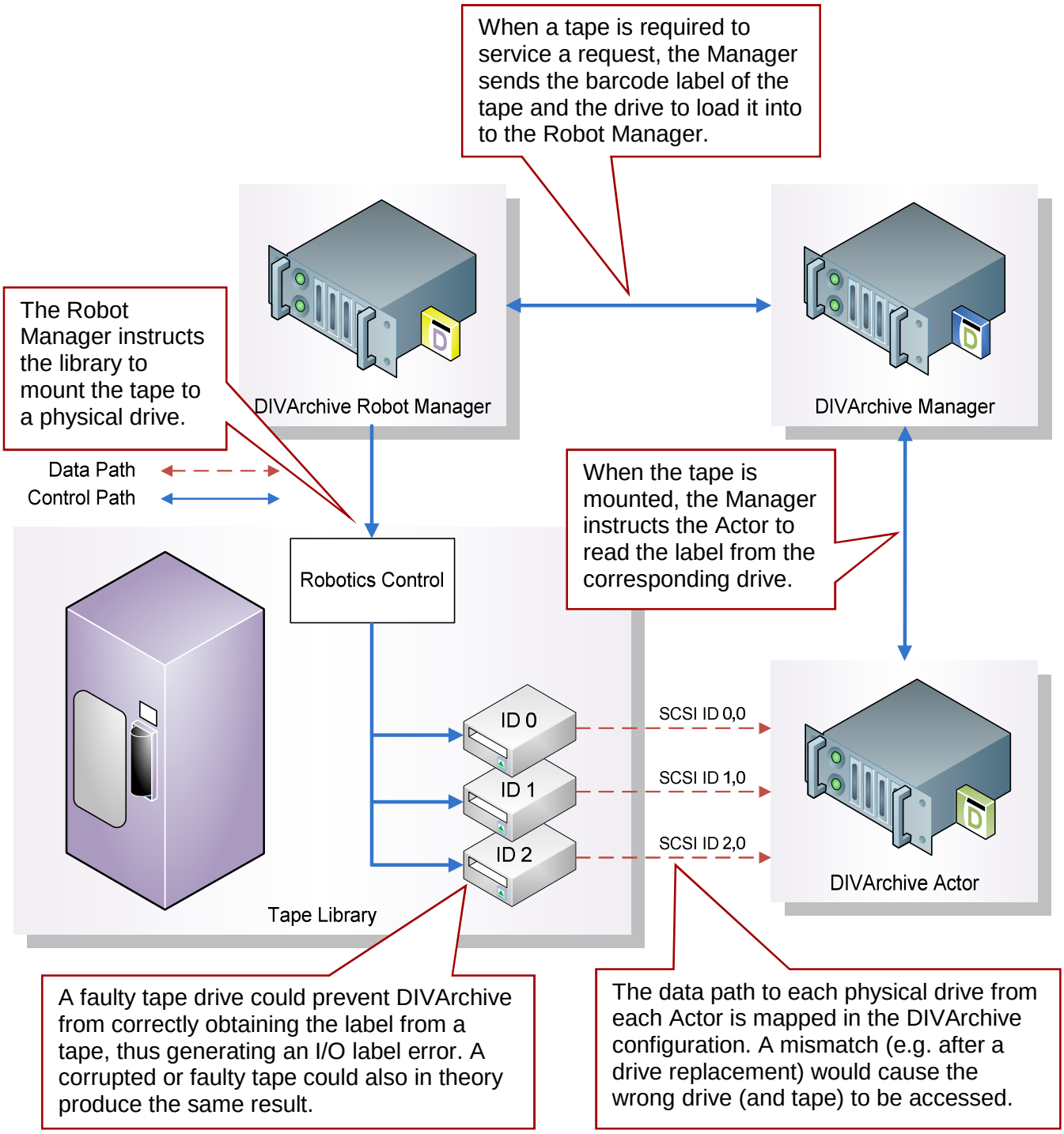
Whenever a tape is mounted, DIVArchive automatically checks the label written on tape to verify that it matches the tape barcode label it instructed the tape library to mount.

This mechanism provides two safety features:

- That the mapping between the physical drives in the library matches that of the logical connections to each tape drive from the Actor (*see the figure below*). This prevents data being written to the wrong tape if there is a configuration mismatch between the physical drives in the library.
- Prevents tapes with foreign labels (*i.e. tapes previously used by another archive system*) from being overwritten in error. This behavior is for environments where DIVArchive shares a library with another archive application, and the tapes used by that archive application have not been set to Set ID 99.

If DIVArchive identifies a mismatch between the expected label and that of the tape, it will generate an I/O Label Error, and the tape will be set to Not Writable and will not be selected for any further write operations.

Figure 11: Tape Label Management


When a tape is required to service a request, the Manager sends the barcode label of the tape and the drive to load it into to the Robot Manager.
The Robot Manager instructs the library to mount the tape to a physical drive.
DIVArchive Robot Manager
DIVArchive Manager
Data Path
Control Path
When the tape is mounted, the Manager instructs the Actor to read the label from the corresponding drive.
Robotics Control
ID 0
ID 1
ID 2
SCSI ID 0,0
SCSI ID 1,0
SCSI ID 2,0
DIVArchive Actor
Tape Library
A faulty tape drive could prevent DIVArchive from correctly obtaining the label from a tape, thus generating an I/O label error. A corrupted or faulty tape could also in theory produce the same result.
The data path to each physical drive from each Actor is mapped in the DIVArchive configuration. A mismatch (e.g. after a drive replacement) would cause the wrong drive (and tape) to be accessed.

2.10 Instances

The storage managed by DIVArchive falls into three distinct classes:

- Online Storage (*tapes within a tape library*).
- Nearline Storage (*disks*).
- Offline Storage (*tapes that are externalized*).

The name and category of an object within DIVArchive 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 **instance**.

Apart from creating backup copies, the object instances concept also allows life-cycling of material within DIVArchive. An object may initially be created in online storage for rapid access, and backup instances created on one or more tapes. When the object is no longer required for Online or Nearline access, the disk instance can be deleted and the tape(s) externalized (*see the figure below for an example of life-cycling of object instances*). Automatic life-cycling of objects, based on their age and location within the archive, can be provided by the DIVArchive Storage Plan Manager (*SPM*) option.

The first instance of an object is created when it is first archived to DIVArchive. Additional instances of the archived object can then be created with the **Copy** and **Associative Copy** commands.

Note: An additional instance of an object *cannot* be created by re-archiving the original object with the same name and category; this request will be automatically aborted by DIVArchive with the '*Object already exists within DIVArchive*' error.

Instances are initially numbered sequentially, with the original object that is archived to DIVArchive being **Instance 0**. As new instances are created and older instances deleted, the instance numbering may no longer be sequential when an object's properties are viewed in the Objects View (*under the Manage Tab*) of the Control GUI. However, an instance number from a previously deleted instance may be subsequently reused by DIVArchive in additional copy requests.

The following restrictions apply to creating new instances of an object within DIVArchive:

- A tape group may contain two instances of the same object, as long as both can be located on separate tapes. If no additional tapes for that group are available in which to store the 2nd instance, the copy request will be aborted.
- A disk array may contain two instances of the same object, as long as both can be located on separate disks within the array. If no additional disk is available, the copy request will be aborted.

When an object has multiple instances within the archive, and a restore request is issued, DIVArchive will perform as follows:

- If no instance number is specified in the restore request, DIVArchive will choose the instance that will allow the request to complete in the shortest possible time (*i.e. a disk instance is preferred over a tape instance*).

  Note: A tape instance could be selected in some configurations, if the QOS specified in the request is Cache Only or Cache and Direct.

- If no instance number is specified in the restore request and a disk instance exists, but the disk itself is offline, the tape instance will automatically be selected.
- If two or more instances are present on tape (*and no disk instances exist*), and one tape is currently in use by another request or is externalized, the tape(s) containing the other instance(s) will automatically be selected.
- If two or more instances exist on tape, and a read error occurs on the first instance selected, it will be attempted automatically on the other instances until the request can be completed successfully. If no instances can be read, the request will be aborted.
- If a specific Instance Number is specified in the restore request, DIVArchive will only use that instance. If the media containing the instance is offline (*disks*), externalized (*tapes*), or an I/O or read error occurs, the request will be aborted.

Figure 12: Sample of Multiple Object Instances

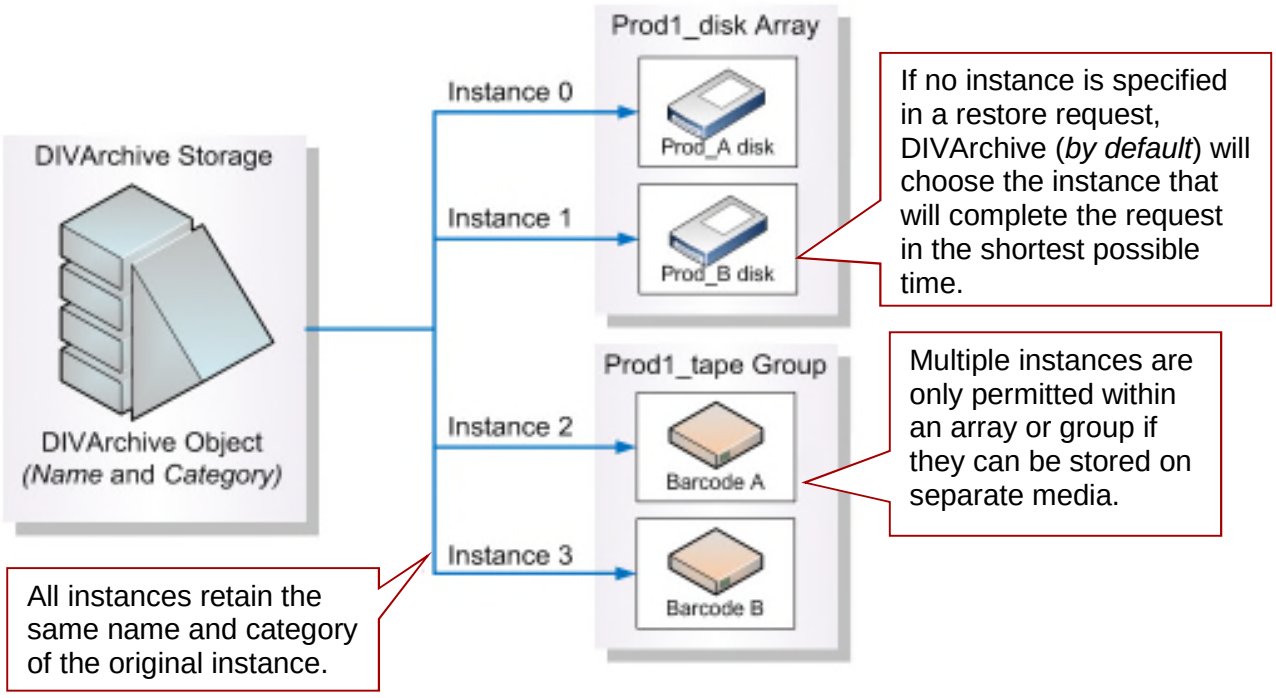
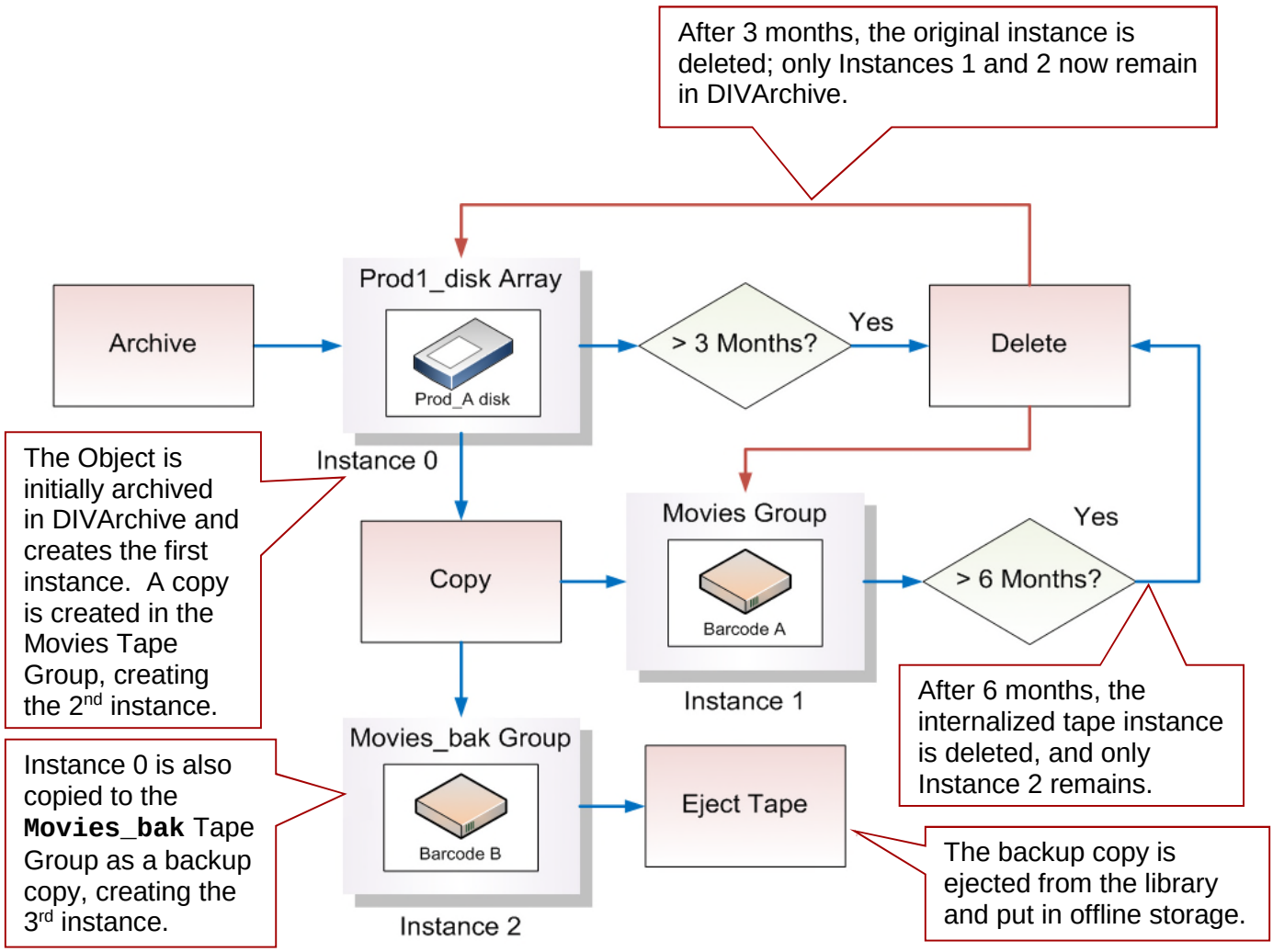


Figure 13: Sample of Multiple Object Instances Workflow



2.10.1 Requiring/Releasing Instances

The mechanism of **Requiring/Releasing** instances enables an application, such as a 3rd party Media Asset Management (*MAM*) System, or a DIVArchive user, to flag the DIVArchive Objects (*or instances*) that are externalized, but need to be restored (*Required)* and which instances are no longer needed and can be externalized (*Released*). The release mechanism can be viewed as a more precise alternative to an (*externalization*) group approach for externalizing instances.

The **Required Release View** in the Control GUI's **Manage Tab** is provided to check instances whose internalized/externalized status is in discrepancy with their Released/Required status. This view also provides an easy and fast means for identifying which tapes are to be entered in the library or can be externalized.

By default, Object Instances are assumed to be available in DIVArchive, so the **Release** command should be invoked on instances before ejecting their corresponding tapes. The **Eject** command however provides an option that automatically performs the release on every instance entirely located on the tapes to be ejected.

Once created, by a copy or an archive, an instance is assumed to be required to be available, so its status is **INSERTED and REQUIRED**. Executing a **Require** command

on a Released Instance leads to a Required Instance; correspondingly, **Releasing** a Required Instance leads to a Released Instance.

2.11 Content Verification

The purpose of the DIVArchive Checksum Support and Content Verification program is to introduce additional levels of verification into the DIVArchive System. This feature introduces checksum generation and verification for each file managed by DIVArchive.

DIVArchive currently supported checksum algorithms include:

- MD2
- MDC2
- MD5
- SHA
- SHA-1
- RIPEMD160

MD5 is the default and recommended checksum algorithm. Although the above list is maintained for backwards compatibility only MD5 and SHA-1 are recommended for best results.

When an object contains multiple files (*components*), a checksum will be generated and later verified for each of the component elements.

There are three types of checksum sources that are distinguishable:

- Genuine Checksum
- Archive Checksum
- Deferred Checksum

The addition of the new **TEXT** Genuine Checksum mode allows DIVArchive to archive all files and subfolders in a specified folder while comparing their checksum values against known values stored in an External Checksum file. Files that do not have a matching checksum in the External Checksum file will be archived with DIVArchive's calculated checksum and the External Checksum file will not be archived.

This new implementation:

- Is a customer-specific implementation.
- Supports only MD5.
- Checksums must be in an .md5 text file.
- Unicode is not supported.

Archive Instructions

1. In DIVArchive Manager, go to **Action**, then **Archive**.
2. In the Source drop-down list, select the **Source/Destination** entry that was created in the Configuration Stage.
3. Set the desired **File Path Root** (*see **Selecting the Root File Path** below for details*).
4. In the **Files Section**, enter in the path to the location of the checksum files (*see **Selecting the Root File Path** below for details*) and append with a wildcard symbol (*asterisk*): *.
5. In the Options Section, enter: **`-r`**
6. Fill in the rest of the entries in the request form and click **Send**.

Limitations

- DIVArchive cannot open or create files on a Windows filesystem if their absolute path exceeds 260 characters. The Root Path must be no more than a total of 260 characters.
- Only ASCII, non-UTF-8 encoded checksum files are supported.
- The format of the Checksum file is that each line begins with an MD5 Checksum, followed by 2 spaces, and then the File Path to the referenced file.

Refer to the *Oracle DIVArchive Checksum Support User Guide* in the DIVArchive Additional Features Documentation library for additional information.

2.11.1 Genuine Checksum via AXF Transfer

The addition of the new **AXF Genuine Checksum** mode allows DIVArchive to archive all files and subfolders in a specified AXF file while comparing their checksum values against known values stored in the AXF file. This kind of workflow is typically combined with a Restore Request with **`-axf`** in the Request Options.

Requirements

- The AXF containing the files to be archived must contain checksum information for each file.
- The AXF must contain checksums of the expected type (*specified in the configuration*).

DIVArchive Configuration Utility Settings

1. Create a new **Source/Destination** entry with **Source Type** set to either **`DISK`**, **`FTP_STANDARD`**, or **`EXPEDAT`** as appropriate.

   If required specify an appropriate **Root Path** – this path along with the input files specified during the Archive Request, will be used in determining the location of the checksum file.

Examples:

- If the Source Type is `DISK`, the Root Path can be set to `D:\root`.
- If the Source Type is `FTP_STANDARD`, the Root Path can be set to `/root`.

2. Set the External Checksum Source to YES.
3. Set the **Checksum Type** to the expected checksum type (*MD5 for example*).
4. Set the **GC Mode** to **AXF**.
5. Click the **OK Button** and notify the **Manager** of the configuration by selecting **Tools**, then **Notify Manager** from the menu.

Archive Instructions

1. In the DIVArchive Manager, select **Action**, then **Archive**.
2. In the **Source** drop-down box, select the **Source/Destination** entry that was created in the Configuration stage (*above*).
3. Set the desired **File Path Root**.
4. In the **Files Section**, enter in the path to the location of the AXF file. The extension of this file must be **`.axf`**.
5. Fill in the remaining entries in the request form and click the **Send Button**.

Limitations

- This workflow only works with AXF requests generated by DIVArchive.
- Verify Following Restore (*VFR*) is not compatible with the **`-axf`** option.

VFR was designed to read back the restored content from a video server to verify it has not been corrupted. Using the **`-axf`** option does not create a “real” restore, rather an object export in an AXF Wrapper. These options are mutually exclusive and should not be part of the same workflow.

Refer to the Oracle DIVArchive Checksum Support User Guide in the DIVArchive Additional Features Documentation library for more information.

2.12 Storage Plan Management

The DIVArchive Storage Plan Manager (*SPM*) software component provides the capability to manage object lifecycle (*interacting with the DIVArchive Manager*) and is typically installed on the same machine as the DIVArchive 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. DIVArchive executes the object lifecycle migration as a background activity by following the rules and policies defined in the corresponding Storage Plan.

SPM now supports disk cleaning based on the object's archived date. Previously, SPM's disk cleaning feature only supports cleaning based on an object's last access time and object size.

Warning: Misconfiguring the SPM may lead to unexpected and disastrous results! Minor changes can lead to catastrophic consequences, for example the deletion of hundreds of thousands of instances on tape, or database corruption. Without special training and familiarity with the product, your Oracle representative should always be contacted before making any changes to SPM. Failure to do so may result in severe damage to the DIVArchive System or even permanent data loss.

Contact your Oracle Support Specialist for more information.

2.13 DIVArchive Request Types

2.13.1 Overview

When connected to the DIVArchive Manager, the **Action Tab** can be accessed from any view in the Control GUI, and allows requests to be issued to DIVArchive. This could be in place of, or in addition to, a 3rd Party initiator application such as an Automation System.

The options in this tab area will only be accessible if you are logged in with the **Administrator** profile (*refer to User Permissions*).

Refer to DIVArchive Control GUI Operations for information on DIVArchive Control GUI Operations.

Figure 14: DIVArchive Control GUI Action Tab Icons

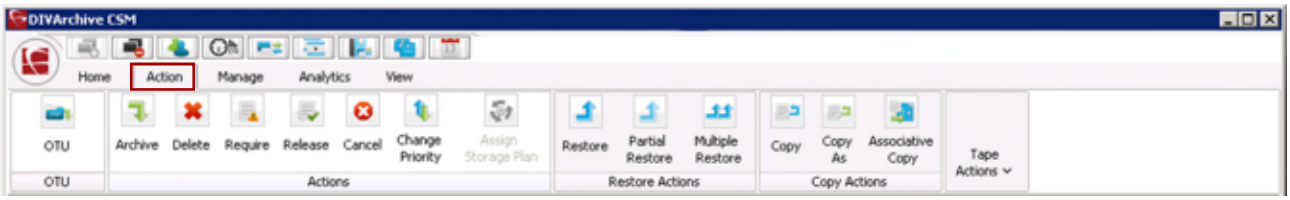


Table 5: DIVArchive Control GUI Command Menu

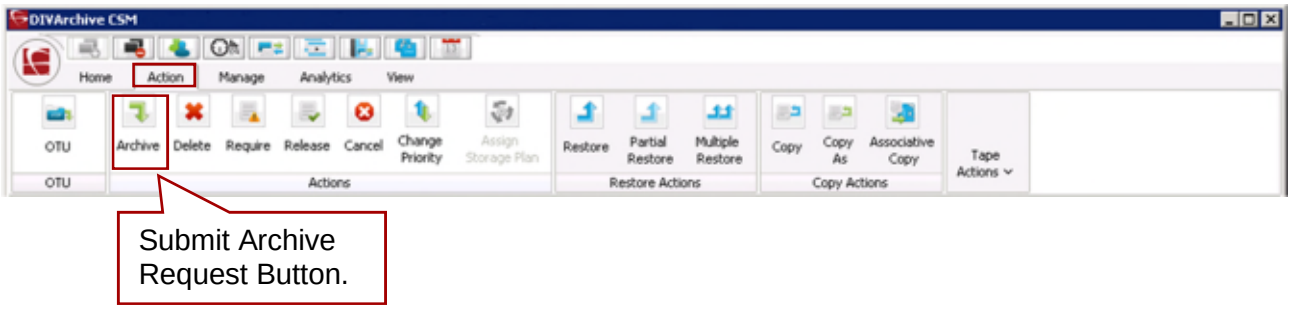
Request	Description
Archive	Copies a file from a source to DIVArchive.
Delete	Deletes all instances, or a selected instance, of a DIVArchive object.
Require	Sets a DIVArchive object status to **Required** (*the associated tape needs to be inserted back into a DIVArchive managed library*).
Release	Sets a DIVArchive object's status to **Released** (*it can now be externalized*).
Cancel	Cancels a previously submitted request (*either by specifying the Request ID or selecting a request beforehand in the Manager Current Requests View*).
Change Priority	Increase or decrease the pending requests scheduler priority.
Assign Storage Plan	Assigns a Storage Plan to the selected object.
Restore	Copies a file from DIVArchive to a single destination.
Partial File Restore (*option*)	Copy only part of a file (*based on timecode, byte offsets, folders, or DPX frames*) from DIVArchive to a destination.

Request	Description
Multiple Restore (*N-Restore*)	Restores from DIVArchive to more than one destination simultaneously.
Copy	Allows an existing DIVArchive object to be copied to another group.
Copy As	Allows an existing DIVArchive object to be copied to another name, group, or category.
Associative Copy	Allows multiple DIVArchive objects from various locations in the archive to all be copied to a single tape with a single command.
Repack Tape	Issues a manual Repack Request for the selected tape.
Verify Tape	Issues a Verify Tape Request for the selected tape.
Insert Tape	Used to insert tapes into a DIVArchive library via its CAP(s).
Eject Tape	Ejects the selected tape(s) from the library to the CAP.
Export Tape	Allows you to export a tape (*and its objects*) from one DIVArchive System to another.
Migrate Content	Transfers the existing content of a tape group to another group or array.
Automatic Repack	Issues an Automatic Repack Request for the selected tape.

2.13.2 Archive

An **Archive** is defined as the transfer of material to DIVArchive, and then stored as a DIVArchive Object. To issue an Archive request, select the **Archive** option from the **Control GUI Action Tab**. This request submits an *Object Archive Request* to the DIVArchive Manager.

Figure 15: Action Tab - Submit Archive Request Button



Clicking the **Archive Button** results in the **Send Archive Request Window** being displayed:

Figure 16: DIVArchive Send Archive Request Window

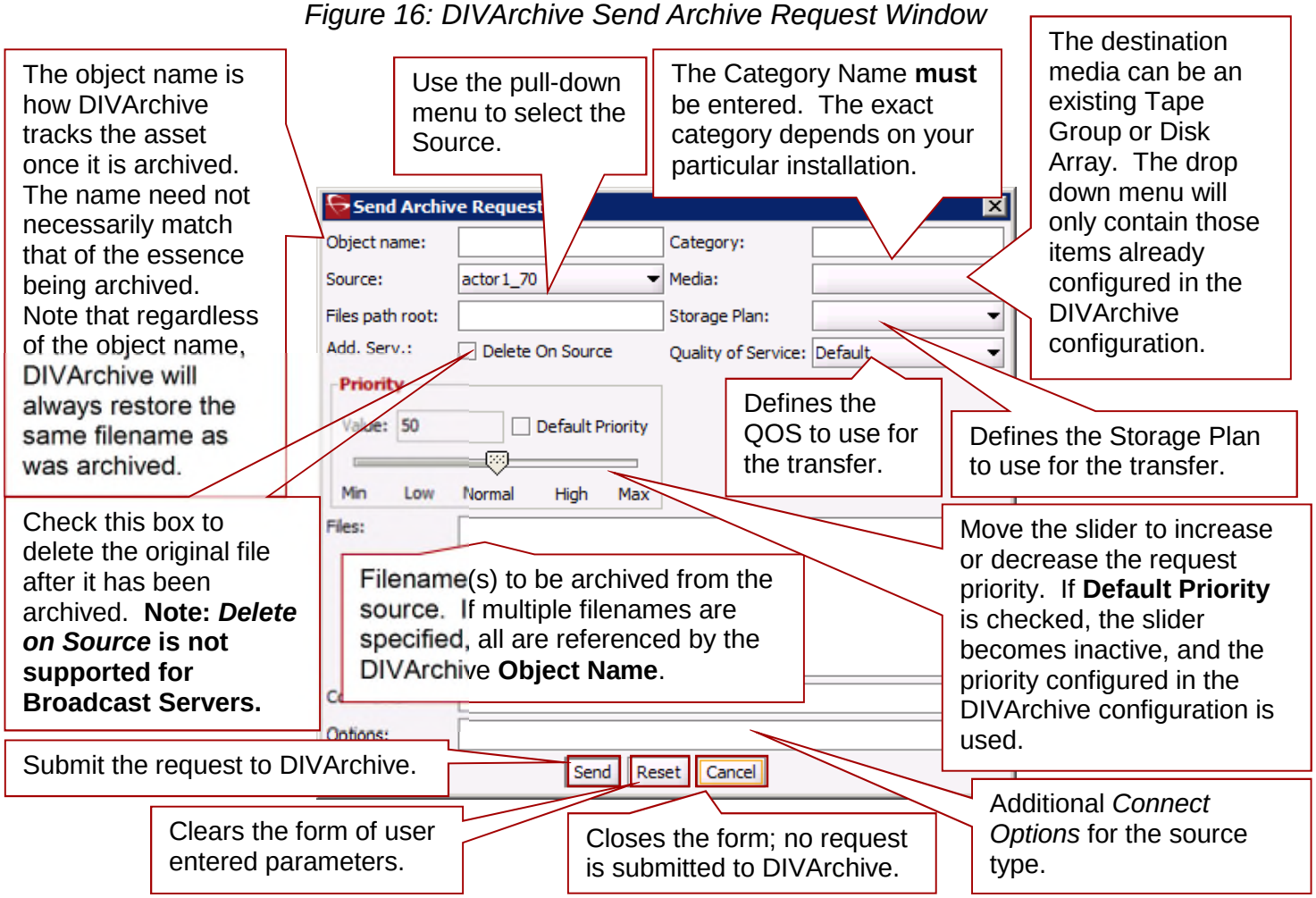


Table 6: Send Archive Request Window Descriptions

Parameter	Description
Object Name	The Name of the Object to be archived.
Category	The Category of the Object.
Source	Name of the Source (*e.g. video server, browsing server*). This name must be known to the DIVArchive Configuration Description.
Media	This designates either a Group of Tapes or an Array of Disks declared in the configuration where the instance has to be created. When this parameter is a null string, the default group of tapes called **DEFAULT** is used.
Files Path Root	Root folder for the files (*see examples below*).

Parameter	Description
Storage Plan	This defines the Storage Plan to use for this Object. If no Storage Plan is assigned the default Storage Plan will be used.
Add. Serv.	Check this box to delete the original file after it has been archived. Note: *Delete on Source* is not supported for Broadcast Servers.
Quality of Service	One of the following codes: **DIVA_QOS_DEFAULT:** Archiving is performed according to the default Quality Of Service (*currently: direct and cache for archive operations*). **DIVA_QOS_CACHE_ONLY:** Use cache archive only. **DIVA_QOS_DIRECT_ONLY:** Use direct archive only. No Disk Instance is created. **DIVA_QOS_CACHE_AND_DIRECT:** Use cache archive if available or direct archive if cache archive is not available. **DIVA_QOS_DIRECT_AND_CACHE:** Use direct archive if available or cache archive if direct archive is not available. Additional and optional services are available. To request those services, use a logical **OR** between the previously documented Quality Of Service parameter and the following constants: **DIVA_ARCHIVE_SERVICE_DELETE_ON_SOURCE:** Delete source files when the tape migration is done. Available for local sources, disk sources, and standard ftp sources.
Priority	The level of priority for this request. The level can be in the range [0...100] or the Default Priority. The value 0 is the lowest priority and 100 the highest. There are five predefined values: • MIN • LOW • NORMAL • HIGH • MAX Move the slider to increase or decrease the request priority. If **Default Priority** is checked, the slider becomes inactive, and the priority configured in the DIVArchive configuration is used.
Files	Filename(s) to be archived from the source. If multiple filenames are specified, all are referenced by the DIVArchive **Object Name**.
Comments	Optional information describing the object (*can be left empty*).

Parameter	Description
Options	Additional options that must be used for performing the transfer of data from the Source to DIVArchive. These options supersede any options specified in the DIVArchive Configuration Database. Currently the possible Options values are: • No entry to specify no options. • **`-r`**: Specifies that every name in **`filenamesList`** that refers to a folder must be scanned recursively. This also applies when a *Files Path Root* is specified and '**`*`**' is used to designate the file(s) to be archived. This option may be used when archiving from a local source or from a standard FTP Server. • **`-login:`** Login is used for some sources**.** This option obsoletes the **`–gateway`** option from the previous version. • **`-pass:`** Password used in conjunction with the **`–login`** option for some sources.

2.13.2.1 Archive Request Files Path Root and Files Parameters

The **Files Path Root** and **Files** parameters on the **Archive Request Window** are used to determine the main folder location and the subfolders/files to be archived. Each serves a different purpose, yet both parameters work in conjunction with each other. A logical business object should be identified before filling in these parameters and executing the request.

The **Files Path Root** identifies the path to the main file folder (*top folder*). For example: **`c:\DROPFOLDER\Media\Object1\.`**

Whatever is entered into the **Files** textbox area identifies the individual files under the main folder (*identified Files Path Root*) and/or additional subfolders and files. For example: **`subfolder1\file3`**.

The **Files** area may contain an absolute path but this is **not** recommended because it prevents the object from being restored to the different root folder.

Assuming a **Files Path Root is** identified, do **not** use the full file path in the **Files** area; **only** use the folder names and filenames that are located **under** the identified **Files Path Root** folder. Alternatively, the **Files Path Root** may be left blank and the full file path and name may be entered into the **Files** area.

Below are a few examples of how this can be utilized:

Correct examples:

The following entries will archive only the specified files located in **`c:\DROPFOLDER\Media\Object1\`** and the **`subfolder1\file3.`**

FILES PATH ROOT: **`c:\DROPFOLDER\Media\Object1\`**

FILES: **`file1`**

`file2`

`subfolder1\file3`

The following entries will archive all folders and files (*) located in **`c:\DROPFOLDER\Media\Object1\.`**

FILES PATH ROOT: **`c:\DROPFOLDER\Media\Object1\`**

FILES: **`*`**

The following entries are correct but **not** recommended because in the future, the Object cannot be restored to a different location. The system will lose flexibility and compatibility with other storage devices and in some scenarios, transcoding and partial file restore capabilities will also be limited. Notice that the **Files Path Root** has been left blank and the absolute paths are entered in the **Files** area.

FILES PATH ROOT:

FILES: **`c:\DROPFOLDER\Media\Object1\file1`**

`c:\DROPFOLDER\Media\Object1\file2`

`c:\DROPFOLDER\Media\Object1\subfolder1\file3`

Incorrect example:

The following entries will result in an error and the archive request will not be completed.

FILES PATH ROOT: **`c:\DROPFOLDER\Media\Object1\`**

FILES: **`c:\DROPFOLDER\Media\Object1\file1`**

`c:\DROPFOLDER\Media\Object1\file2`

`c:\DROPFOLDER\Media\Object1\subfolder1\file3`

2.13.2.2 Archive Request with Delete on Source

There are instances where it is required to delete content and possibly the parent folder on a server. In order to satisfy all possible scenarios there are two options available:

- **`-r`** (*recursive*)
- **`-delete_fpr`** (*includes deletion of a parent folder*)

The two options, **`-r`** and **`-delete_fpr`**, work either separately or together as described in the following workflow examples:

Example 1:

FilesPathRoot: **`C:\source\root`**

Files: **`*`**

Options: **`-r`**

Result: DIVArchive will:

- Delete the content of **`C:\source\root`** recursively.

Example 2:

FilesPathRoot: `C:\source\root`

Files: `*`

Options: `-r –delete_fpr`

Result: DIVArchive will:

- Delete the content of `C:\source\root` recursively
- Delete `root`.

Example 3:

FilesPathRoot: `C:\source\root`

Files: `*`

Options:

Result: DIVArchive will:

- Delete the content of `C:\source\root` (*first level only*).

Example 4:

FilesPathRoot: `C:\source\root`

Files: `*`

Options: `-delete_fpr`

Result: DIVArchive will:

- Delete the content of `C:\source\root` (*first level only*)
- Eventually delete root if it is empty.

Example 5:

FilesPathRoot: `C:\source\root`

Files: `object\*`

Options: `-r`

Result: DIVArchive will:

- Delete the content of `C:\source\root\object` recursively.
- Delete `C:\source\root\object`.

Example 6:

FilesPathRoot: `C:\source\root`

Files: `object\*`

Options: `-r –delete_fpr`

Result: DIVArchive will

- Delete the content of **`C:\source\root\object`** recursively.
- Delete **`C:\source\root\object.`**
- **`Delete C:\source\root if empty`**.

Example 7:

FilesPathRoot: `C:\source\root`

Files: `object1\*`

`Object2\*`

Options: `-r`

Result: DIVArchive will

- Delete the content of **`C:\source\root\object1`** recursively.
- Delete **`C:\source\root\object1.`**
- Delete the content of **`C:\source\root\object2`** recursively.
- Delete **`C:\source\root\object2.`**

Example 8:

FilesPathRoot: `C:\source\root`

Files: `object1\*`

`object2\*`

Options: `-r –delete_fpr`

Result: DIVArchive will

- Delete the content of **`C:\source\root\object1`** recursively.
- Delete **`C:\source\root\object1.`**
- Delete the content of **`C:\source\root\object2`** recursively.
- Delete **`C:\source\root\object2.`**
- Delete **`C:\source\root`** if it is empty.

Example 9:

FilesPathRoot: `C:\source\root`

Files: `object1\*`

`object2\subfolder\clip.mov`

Options: `-r –delete_fpr`

Result: DIVArchive will

- Delete the content of **`C:\source\root\object1`** recursively.
- Delete **`C:\source\root\object1.`**
- Delete the content of **`C:\source\root\object2\subfolder\clip.mov`**.
- Delete **`C:\source\root\object2\subfolder`** if it is empty**.**
- Delete **`C:\source\root\object2`** if it is empty**.**
- Delete **`C:\source\root`** if it is empty.

2.13.3 Delete / Delete Instance

Use the **Delete** command to delete a DIVArchive Object (*i.e. all instances of that object*), or only a specific instance of the object from DIVArchive. **Use this command with caution.** This command submits an **Object Delete Request** to the DIVArchive Manager and the Manager deletes every instance of the object unless otherwise specified.

The **Instance** field of the Delete request determines exactly what will be deleted from DIVArchive. If this field is left empty, the object will be totally removed (*i.e. all instances of that object will be deleted from DIVArchive*). A specific number entered into this field will only delete the specified instance.

The Delete Request is initiated using the **Delete Button** on the Ribbon Bar, or the **Objects View** in the **Manage Tab** by right-clicking the object to delete and selecting **Delete** from the resulting menu as shown in the figure below. If the Delete command is selected from the **Objects View**, the instance field is updated automatically with the instance selected (*only instance deletion is supported from this view*).

Note: Deletes and Repacks do not clear WORM Media as these are Write-Once media. The instances are deleted, but the space is not recoverable.

Figure 17: Action Tab Ribbon Bar – Delete Button

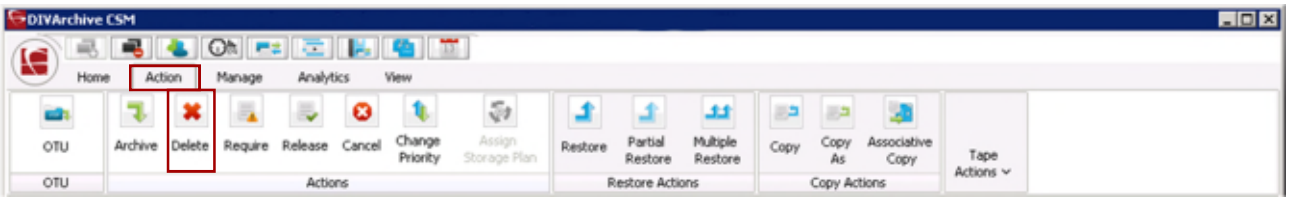


Figure 18: Objects View Right-Click Menu (Delete)

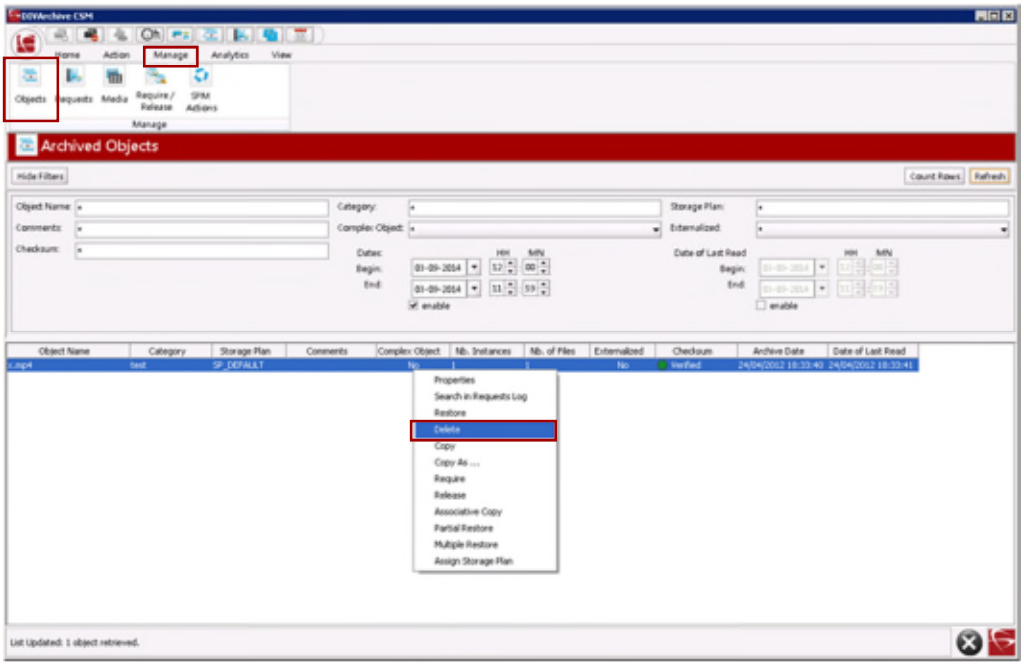


Figure 19: Delete Request Window

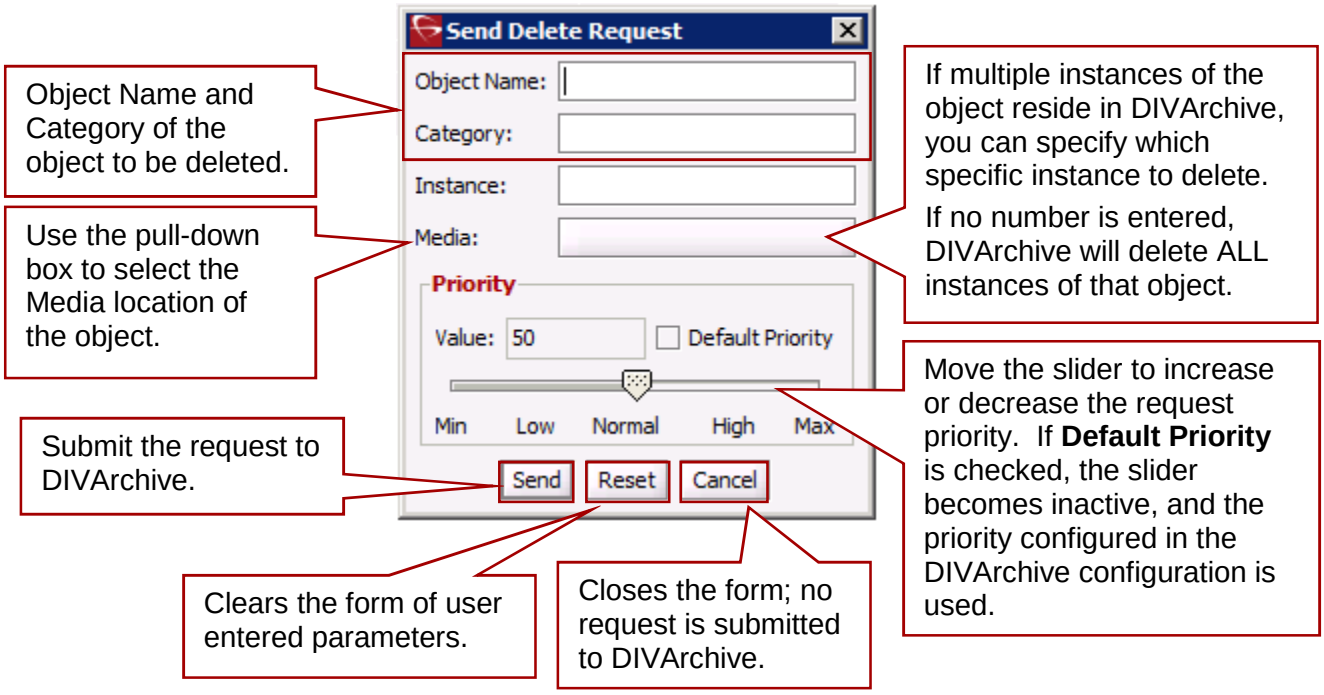


Table 7: Send Delete Request Window Parameters

Parameter	Description
Object Name	Name of the Object to be deleted.
Category	Category assigned to the object when it was archived. This parameter can be a null string (*this may result in an error if several objects have the same name*).
Instance	If multiple instances of the object reside in DIVArchive, you can specify which specific instance to delete. If no number is entered, DIVArchive will delete ALL instances of that object.
Media	The media can be an existing Tape Group or Disk Array. The drop down menu will only contain those items already configured in the DIVArchive configuration.
Priority	The level of priority for this request. The level can be in the range [0...100] or the Default Priority. The value 0 is the lowest priority and 100 the highest. There are five predefined values: • MIN • LOW • NORMAL • HIGH • MAX Move the slider to increase or decrease the request priority. If Default Priority is checked, the slider becomes inactive, and the priority configured in the DIVArchive configuration is used.

2.13.4 Require or Release

Requiring or **Releasing** objects is primarily a database entry for instances that are, or can be, externalized from the tape library. Tapes that can be externalized or need to be internalized are determined through the **Req. Instances View**.

Require indicates to the DIVArchive Manager that this instance should be inserted. If the instance is already required, this request has no effect. The list of instances that are **REQUIRED** and **EJECTED** may be retrieved and shown at the Control GUI.

The **Require / Release** Request is initiated using either the **Require** or **Release Button** on the Ribbon Bar, or the **Objects View** in the **Manage Tab** by right-clicking the object to copy and selecting either **Require** or **Release** from the resulting menu as shown in the figure below.

Figure 20: Action Tab Ribbon Bar – Require and Release Buttons

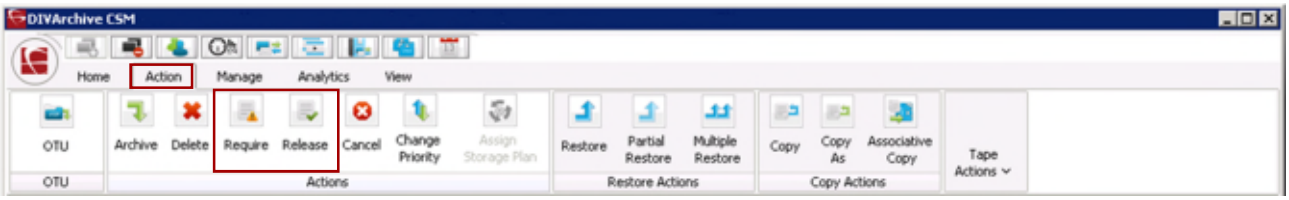


Figure 21: Objects View Right-Click Menu (Require and Release)

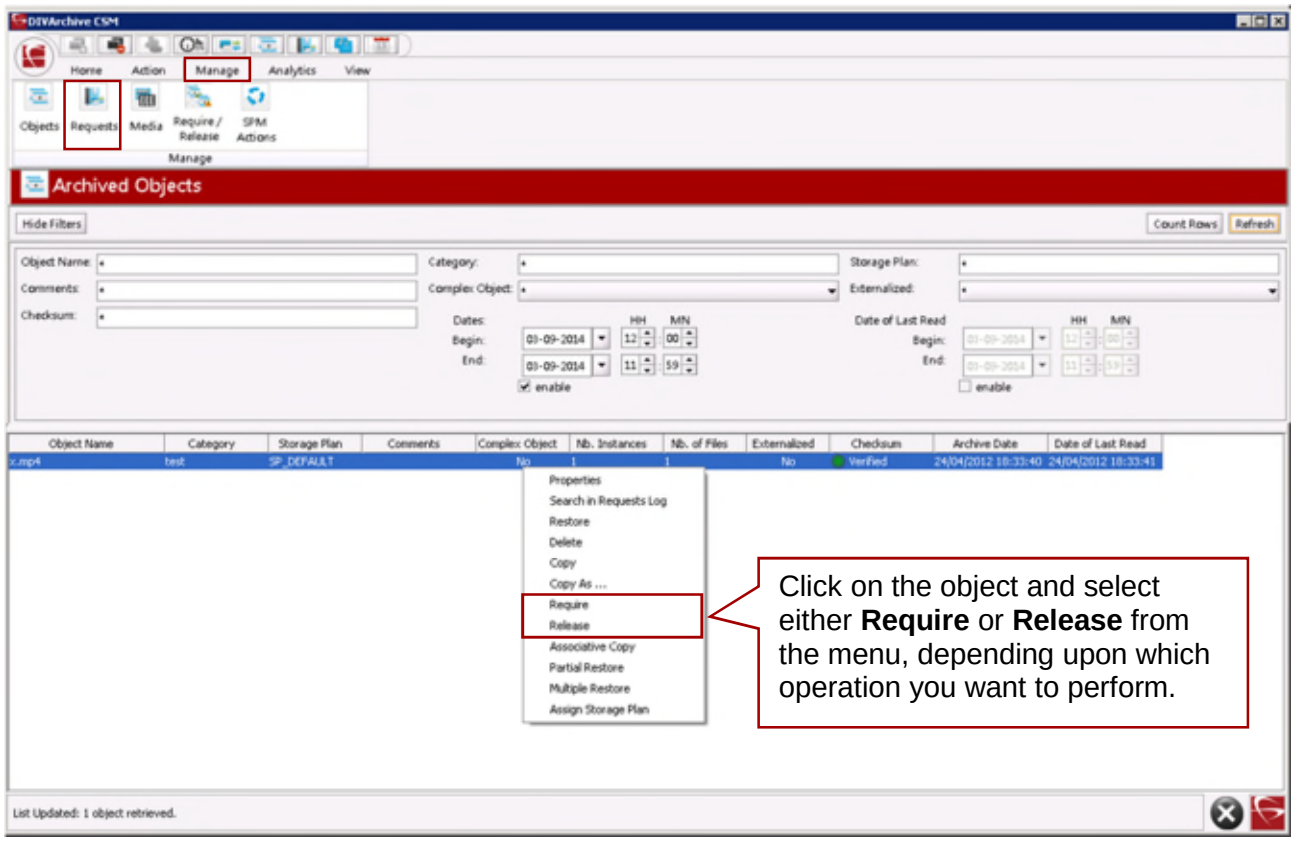


Figure 22: Send Require Request Window

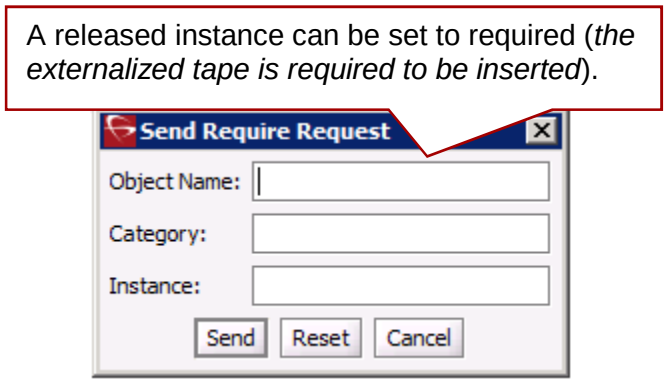


Table 8: Send Require Request Window Parameters

Parameter	Description
Object Name	Name of the required object.
Category	Category assigned to the object when it was archived. This parameter can be left empty but this may result in an error if several objects have the same name.
Instance	No value entered here forces the function to apply to every instance of the given object.

Release indicates to the DIVArchive Manager that this instance can be externalized. If this instance has already been released, this request has no effect. The list of instances that are **RELEASED** and **INSERTED** may be retrieved and shown at the Control GUI. **A releasable tape is one that only contains released instances.**

Figure 23: Send Release Request Window

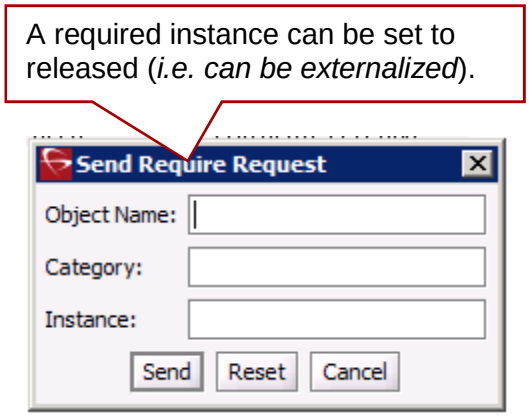


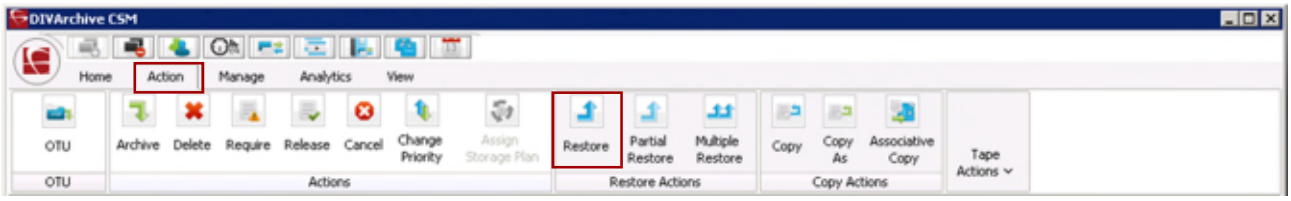
Table 9: Send Release Request Window Parameters

Parameter	Description
Object Name	Name of the object to be released.
Category	Category assigned to the object when it was archived. This parameter can be left empty but this may result in an error if several objects have the same name.
Instance	No value entered here forces this function to apply to every Instance of the given object.

2.13.5 Restore

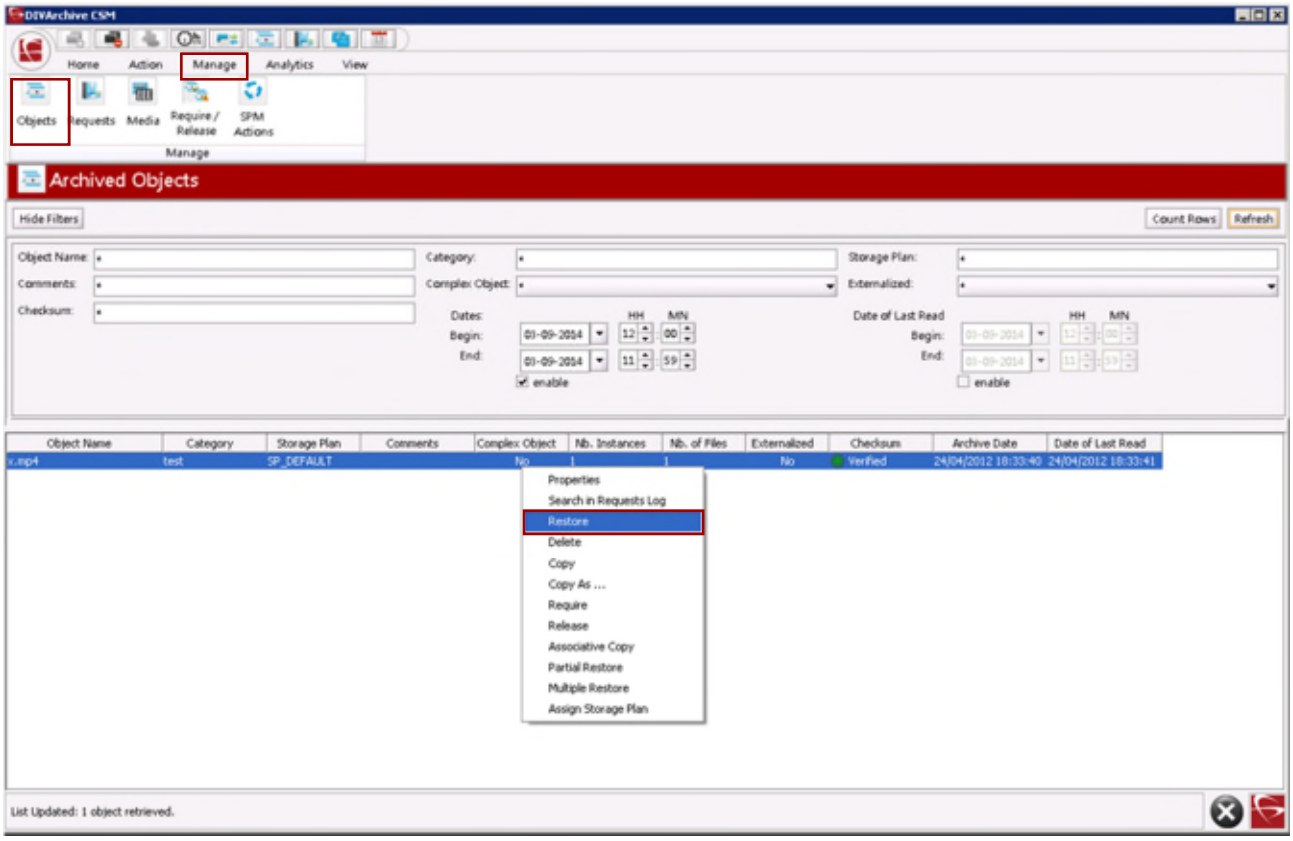
A **Restore** is defined as the transfer of a DIVArchive Object to a destination, and can be selected from the **Control GUI Action Tab**.

Figure 24: Action Tab - Submit Restore Request Button



The Restore command can also be issued from the **Objects View** in the **Manage Tab** by right-clicking the object to restore and selecting **Restore** from the resulting menu as shown in the figure below.

Figure 25: Objects View Right-Click Menu (Restore)



This request submits an **Object Restore Request** to the DIVArchive Manager and the Manager chooses the appropriate instance to be restored. In the event the requested object is on media that is not available, the request will fail.

Figure 26: DIVArchive Send Restore Request Window

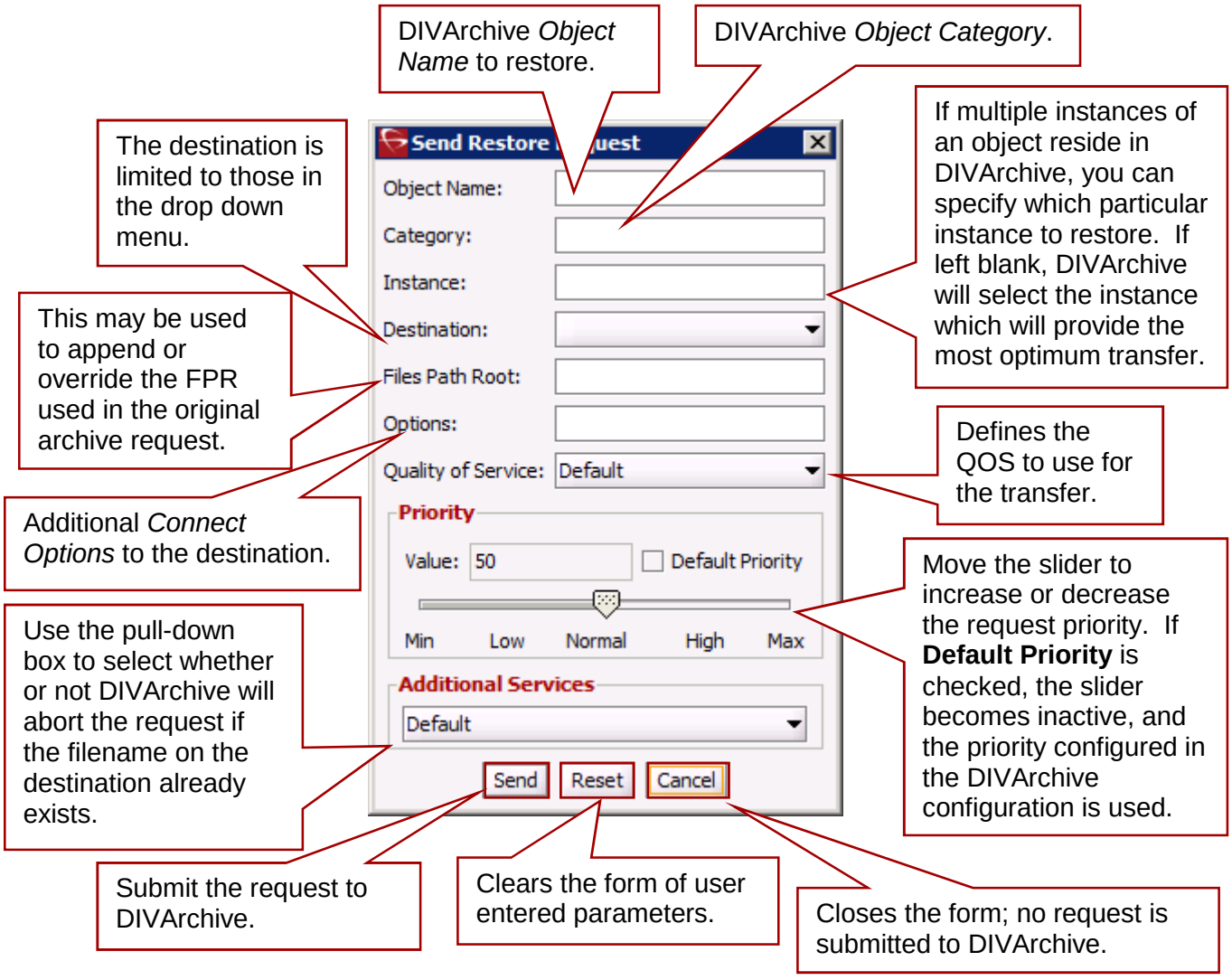


Table 10: Send Restore Request Window Parameters

Parameter	Description
Object Name	Name of the object to be restored.
Category	Category assigned to the object when it was archived. This parameter can be a null string (*this may result in an error if several objects have the same name*).
Instance	If multiple instances of an object reside in DIVArchive, you can specify which particular instance to restore. If left blank, DIVArchive will select the instance which will provide the most optimum transfer.
Destination	Destination (*e.g. video server or browsing server*) for the object files. This name must be known by the DIVArchive Configuration Description. Use the drop-down menu to select the desired Destination.

Parameter	Description
Files Path Root	Root folder on the destination where the object files will be placed. This option appends or overrides the FPR used in the original archive request. If left empty, the files will be placed in the Files Path Root folder specified when archiving the object.
Options	Additional options that must be used for performing the transfer of data from DIVArchive to the destination. These options supersede any options specified in the DIVArchive Database. Currently the possible Options values are: • No entry to specify no options. • **`-login`**: Login is used for some sources. This option obsoletes the **`-gateway`** option of the previous version. • **`-pass`**: Password used in conjunction with the **`-login`** option for some sources.
Quality of Service	One of the following codes: **`DIVA_QOS_DEFAULT:`** Restoring is performed according to the default Quality Of Service (*currently: direct and cache for restore operations*). **`DIVA_QOS_CACHE_ONLY:`** Use cache restore only. **`DIVA_QOS_DIRECT_ONLY:`** Use direct restore only. **`DIVA_QOS_CACHE_AND_DIRECT:`** Use cache restore if available or direct restore if cache restore is not available. **`DIVA_QOS_DIRECT_AND_CACHE:`** Use direct restore if available or cache restore if direct restore is not available. **`DIVA_QOS_NEARLINE_ONLY:`** Use Nearline restore only. Nearline restore will restore from a disk instance if a disk instance exists, otherwise, it will create a disk instance and restore from the newly created disk instance. **`DIVA_QOS_NEARLINE_AND_DIRECT:`** Use Nearline restore if available, or direct restore if Nearline restore is not available. Additional and optional services are available. To request those services use a logical **`OR`** between the previously documented Quality Of Service parameter and the following constants: **`DIVA_RESTORE_SERVICE_DO_NOT_OVERWRITE:`** Do not overwrite existing files on the destination server. **`DIVA_RESTORE_SERVICE_DO_NOT_CHECK_EXISTENCE:`** Do not check existence of the clip on the server. **`DIVA_RESTORE_SERVICE_DELETE_AND_WRITE:`** Force delete and rewrite if object exists on the server. **`DIVA_RESTORE_SERVICE_DEFAULT:`** Operate using the default setting in the Manager Configuration.

Parameter	Description
Priority	The level of priority for this request. The level can be in the range [0...100] or the Default Priority. The value 0 is the lowest priority and 100 the highest. There are five predefined values: • MIN • LOW • NORMAL • HIGH • MAX Move the slider to increase or decrease the request priority. If **Default Priority** is checked, the slider becomes inactive, and the priority configured in the DIVArchive configuration is used.
Additional Services	Use the pull-down box to select whether or not DIVArchive will abort the request if the filename on the destination already exists.

2.13.6 Archive and Restore in AXF Mode

In DIVArchive 7.3, an Archive Request for an AXF file results in DIVArchive automatically detecting that the file is an AXF file. Rather than archiving the AXF file itself, it will archive the contents of the AXF file, retrieving the Checksums and Provenance of the Object.

The AXF Archiving and Restore functionality includes:

- Archive the content of an AXF file using auto-detection.
  - Identifies the **`.axf`** filename extension.
  - Makes sure it is a single file.
  - Checks the beginning of the file for specific AXF properties.
  - Checks for Metadata information.
- Restores an object into a new single AXF file.
  - Previously this operation would have resulted in multiple files.
- Preservation of Checksums.
- Preservation of Metadata.
- Preservation of Provenances.
- Supports Complex Objects.

This option works with the following types of Source/Destinations:

- FTP_STANDARD
- LOCAL
- DISK
- CIFS
- EXPEDAT

There has been a new Source/Destination option added for AXF mode (**`-axf`**) as follows:

Synopsis:

Restore in AXF Mode.

- **`-axf`** option is used.

Description:

The restore request optional parameter **`-axf`** is used to instruct DIVArchive to restore the original asset into an AXF file. Instead of purely restoring the content of an object to the destination, DIVArchive will restore the content into a new AXF Wrapper. Combined with **`-rm`** or **`-rxml`**, this option can be used to export an object with Metadata information and then drop it to a DFM Watch Folder.

2.13.7 Partial File Restore

DIVArchive supports four types of Partial File Restore: 1) Files and Folders, 2) Byte Offset, 3) Timecode, 4) DPX. The type of Partial File Restore that will be implemented is determined by the format parameter in the request.

This request submits a **Partial Object Restore Request** to the DIVArchive Manager and the Manager chooses the appropriate instance to be restored.

If the requested object is on media that is not available the request will fail.

The following describes each type of Partial File Restore:

- **Files and Folders:** This type of Partial File Restore allows extracting entire files from the archive or extracting entire directories and their contents. DIVArchive allows you to extract multiple files and directories in the same request. The files are restored with the file/path names that were specified in the archive; no renaming option is valid in File/Folder Partial File Restore. For example, a file archived as **`misc/12-2012/movie.avi`** would be partially restored to a **`misc/12-2012`** subdirectory with the name **`movie.avi`**.

  When a folder is specified in a File/Folder Partial File Restore, all files within that folder (*as well as the folder itself*) are restored as well. In addition, each directory to be restored can have a **`-r`** option to recursively restore all folders nested within the target folder.

- **Byte Offset:** This allows a range of bytes to be extracted from a particular file in the archive. For instance, it is possible to extract bytes 1 to 2000 (*the first 2000*

bytes of the file), or byte 5000 to the end of the file (*or both*) and store them to an output file such as **`movie.avi`**.

Note: The result of the Byte Offset Partial File Restore is usually unplayable when applying to video files. Actor will not apply the header, footer, etc. according to the video format.

- **Timecode:** This type of Partial File Restore allows you to select a portion of a particular media file based on timecode. For instance, you could extract from 00:00:04:00 to 00:10:04:00 (*a 10 minute segment starting 4 seconds in and ending at 10 minutes and 4 seconds*), and place that segment into an output file such as **`movie.avi`**. This file is a smaller version of the original movie file.

  Note: The result of the Timecode Partial File Restore is a valid clip when applying to video files. Actor will apply the header, footer, etc. according to the video format. If Actor is unable to parse the format, the request will be aborted. This type of Partial File Restore can only be applied to a valid video clip.

- **DPX:** This Partial File Restore type allows extracting a range of DPX files from the archive. In this type of restore, the entire object is viewed as a single media item, with one DPX file representing one frame of media. Only **`.dpx`**, **`.tif`**, and **`.tiff`** files in the archive are considered *frames* for the purposes of this command.

  The first **`.dpx`** file (*or **`.tif`** or **`.tif`** file*) in the archived object is considered frame 1, the second **`.dpx`** in the archive is frame 2, and so on.

  In the unlikely event that the **`.dpx`**, **`.tif`**, and/or **`.tiff`** files are mixed, the first sequential file of any of the three extensions will determine which files are considered to part of the sequence. For example: if a *stray* **`.tif`** file found its way into a collection of **`.dpx`** files and came first in the sequence, the sequence would be interpreted as a **`.tif`** sequence with **`.dpx`** files being ignored; even if this were not the intention of the operator.

  For example, if a user wants to extract frames 10 through 15 using DPX Partial File Restore, this would restore the 10th **`.dpx`** file that appears in the archive, 11th **`.dpx`** file, etc… ending with the 15th **`.dpx`** file, for a total of six files. Any other files (*such as* **`.wav`** *files*) are skipped by DPX Partial File Restore.

  Special frame numbers 0 and -1 may be used to refer to the first and last frame respectively. Frame 0 is valid as the start of a frame range and Frame -1 is valid as the end of a range.

  Valid frames and ranges are:

  - Frame 0 = first frame (*use Start of File checkbox*).
  - Frame 1 = the first frame in the sequence.
  - Frame n = the nth frame in the sequence.
  - Frame -1 = last frame (*use End of File checkbox*).
  - Specifying frame 0 as the last frame is considered invalid.
  - Specifying Frame 0 to 0 is currently invalid and will not return the first frame as might be intended.

- Specifying Frame 0 to 1 or Frame 1 to 1 will return the first frame.
- Specifying the Frame -1 in the first frame is currently an error, which does not allow you to specify Frame -1 to -1 to return the exact last frame in the event that the exact number of the last frame is unknown.

Examples:

- **`startRange=0 – endRange=1`**
  - Restores the first frame only.
- **`startRange=600 – endRange=635, startRange=679 – endRange=779`**
  - Restores frames 600 through 635, and frames 679 through 779.
- **`startRange=810 – endRange=-1`**
  - Restores all frames from frame 810 to the end of the archive.

The actual filename may, or may not, match the frame number in DIVArchive. Upon restore, DIVArchive interrogates the archive, finds the file order, and determines the Frame Number from the resulting file order found; it does not consider the filename. The first **`.dpx, .tif,`** or **`.tiff`** file found is considered Frame 1.

Care must be given when archiving DPX files to ensure they can be partially restored properly. This is in part because DPX Partial File Restore does not examine the file name or the DPX header information to determine which file is assigned to which frame. The assignment is based purely upon the order in which the **`.dpx`** files appear in the archive. This order, by default, is based on ordering established by the source and is typically alphanumeric. For example, NTFS DISK Source/Destinations order files and folders case insensitively as a general rule (*but not where diacritical marks, such as* **`'`**, **`` ` ``**, **`^`**, *etc. are applied*).

When DIVArchive encounters a subfolder, by default it recursively processes all of the children of that folder (*including subfolders*) before continuing with other files. If a folder appears in the alphanumeric folder listing, it is archived recursively in the order that it appears.

However, this can create some issues – you may want all of the subdirectories of a given directory processed first, followed by the files in the directory. Or, you might want all files processed first, then subdirectories.

DPX Partial File Restore looks at an entire object as a single piece of media. If multiple reels or clips appear in an archive, they can be stored in folders and partially restored via File/Folder Partial File Restore, but they will be viewed as one long movie clip to DPX Partial File Restore. If this is a desired effect, ensure that the directories are sorted alphanumerically in the order that the frames should be arranged.

The first **`.dpx`** file (*or* ***`.tif`****, or* ***`.tiff`*** *file*) in the archived object is considered frame 1, the second **`.dpx`** in the archive is frame 2, and so on.

DIVArchive does not perform any special audio handling for DPX media (*other than what might be embedded in DPX files themselves*). DIVArchive can support transcoding of DPX media, but keep in mind that a transcoder may change the filenames and/or file order of the DPX archive.

A **Partial File Restore Request** may be submitted by either clicking on the **Partial Restore** icon under the **Action Tab**, or by viewing **Archived Objects** under the **Manager Tab** and right-clicking the desired object.

Figure 27: Action Tab - Submit Partial Restore Request Button

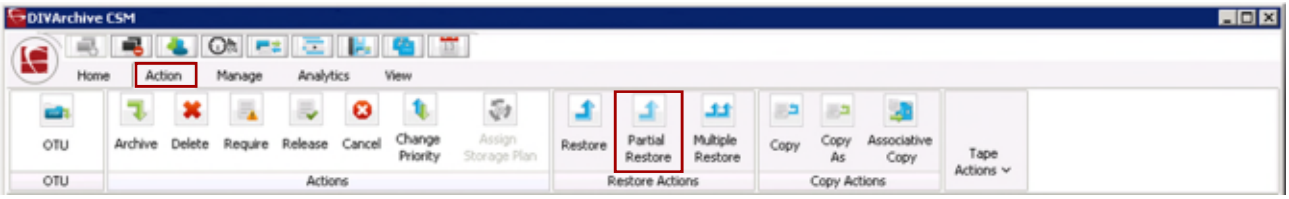
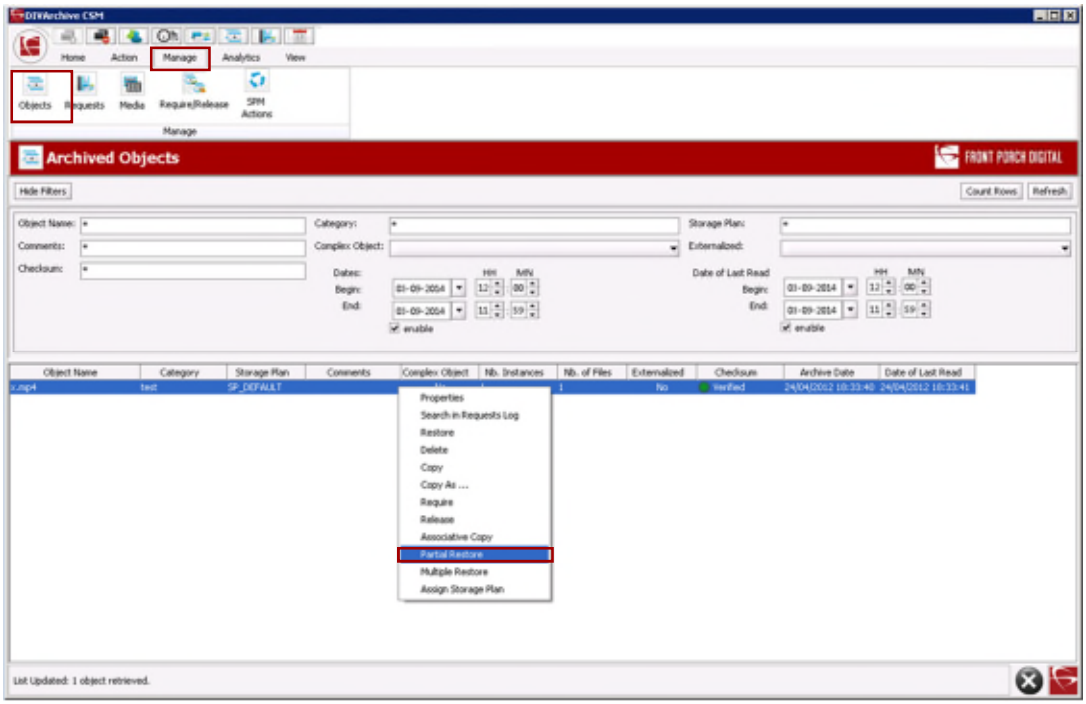
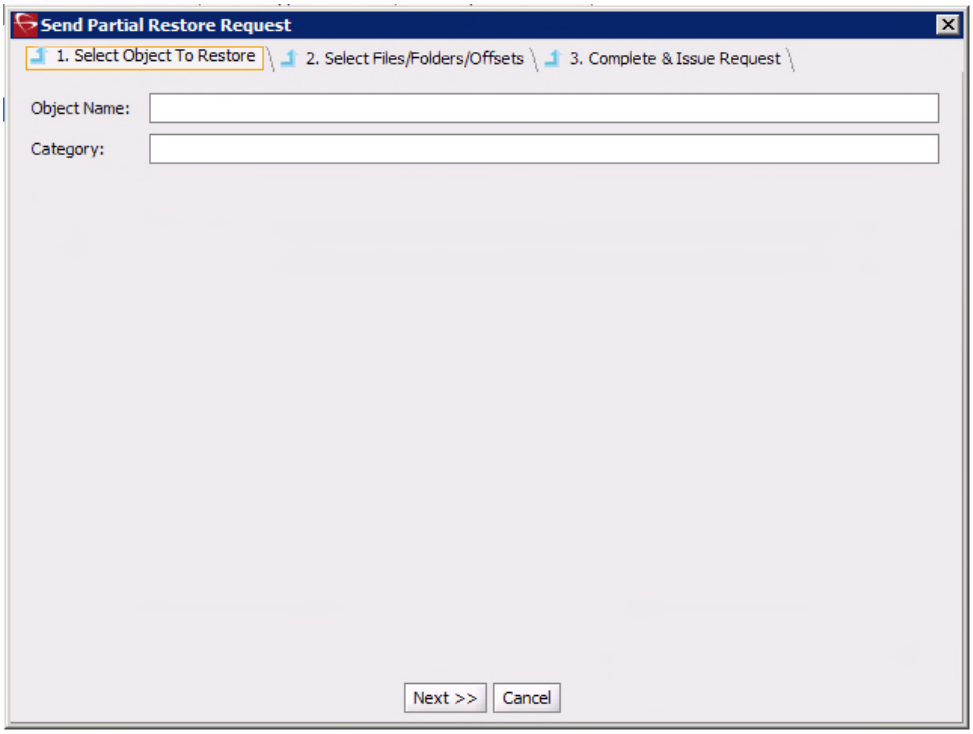


Figure 28: Objects View Right-Click Menu (Partial Restore)



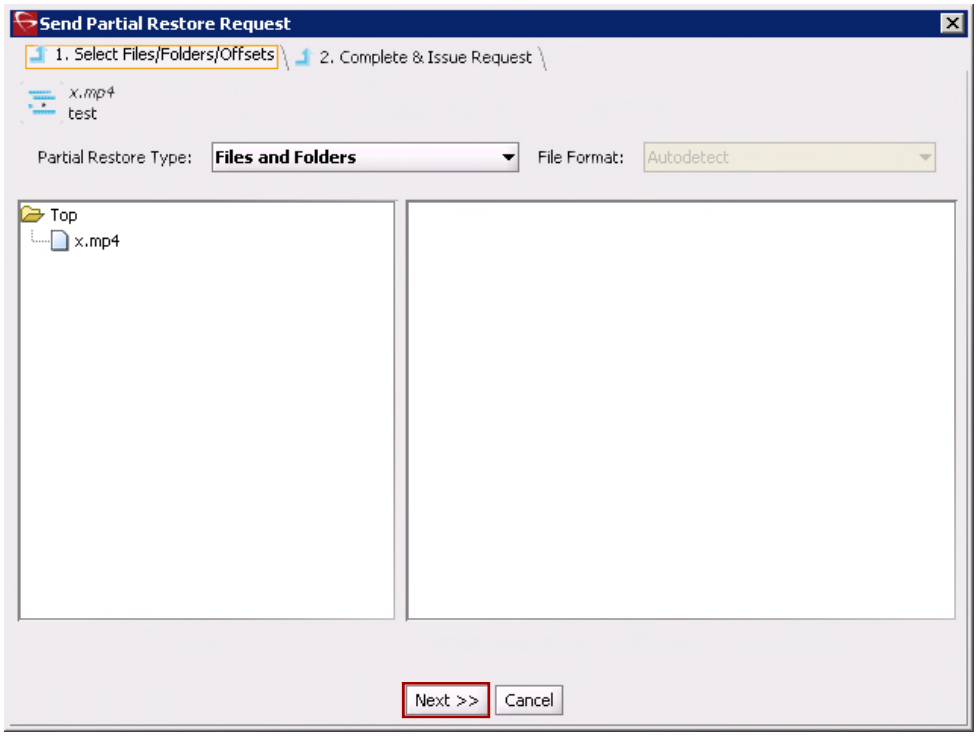
Either method results in the **Partial Restore Wizard** being displayed. If no object is selected and the Partial Restore icon (*under the Action Tab*) is used, the wizard opens to Step 1 (*of 3*) and the Object Name and Category must be entered manually.

Figure 29: Partial Restore Wizard Step 1 – No Object Selected



If an object was selected and the right-click menu was used, the wizard will open to Step 1 (*of 2*) as displayed below. This Step is similar to Step 2 using the previous method to open the wizard window.

Figure 30: Partial Restore Wizard – Object Selected



Once the **Object Name** and **Category** are entered, or the Object is selected in the left pane, click the **Next Button** to move to the next step.

The next step in the wizard is to select the type of **Partial File Restore** to perform using the pull-down box. Each type of **Partial File Restore** has different options associated with it as described below. **Files and Folders Partial File Restore** does not have any specific options associated with it.

Figure 31: Partial Restore Wizard Step 2 – Selecting Partial Restore Type

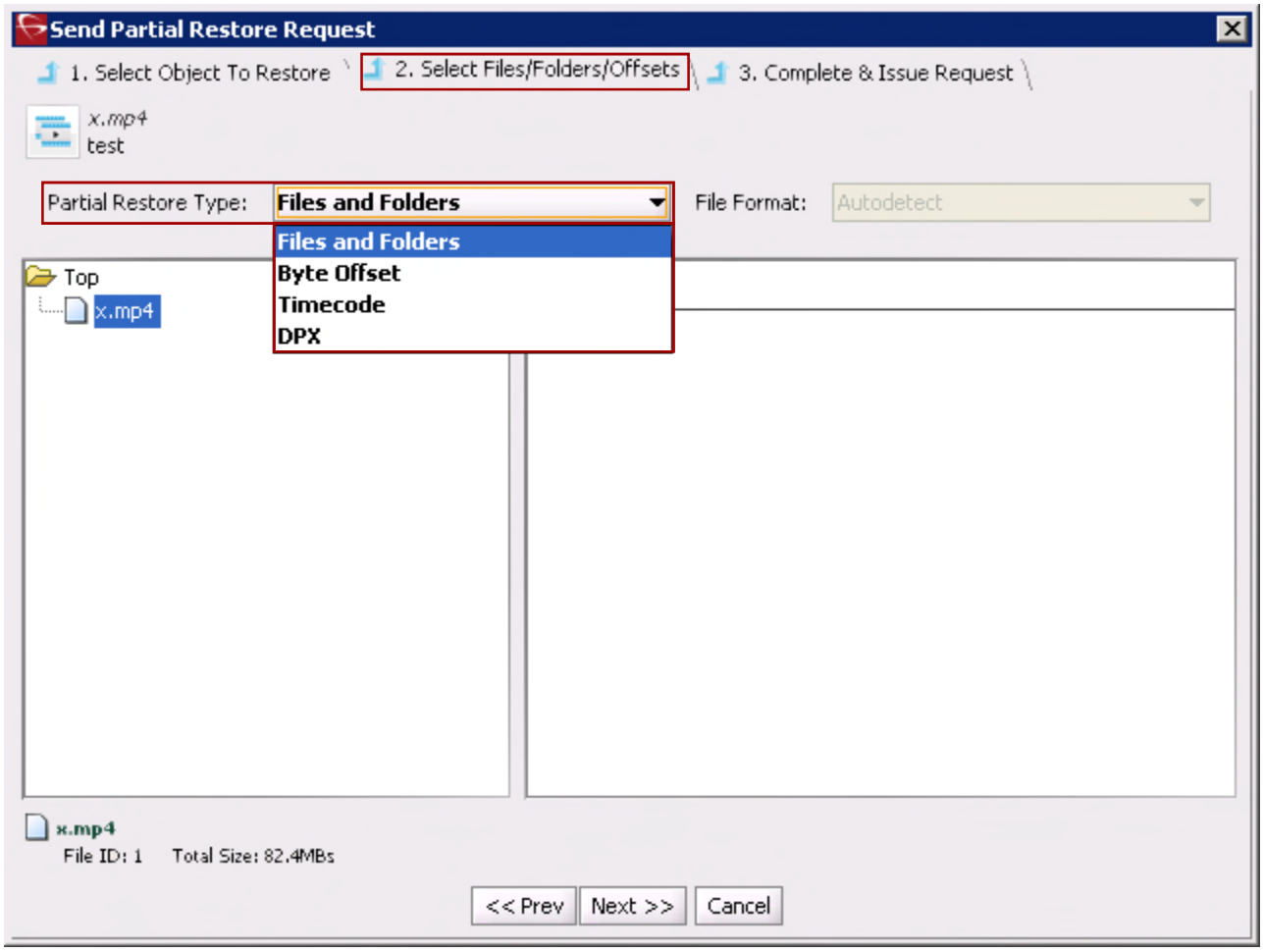


Figure 32: Files and Folders Partial Restore Options

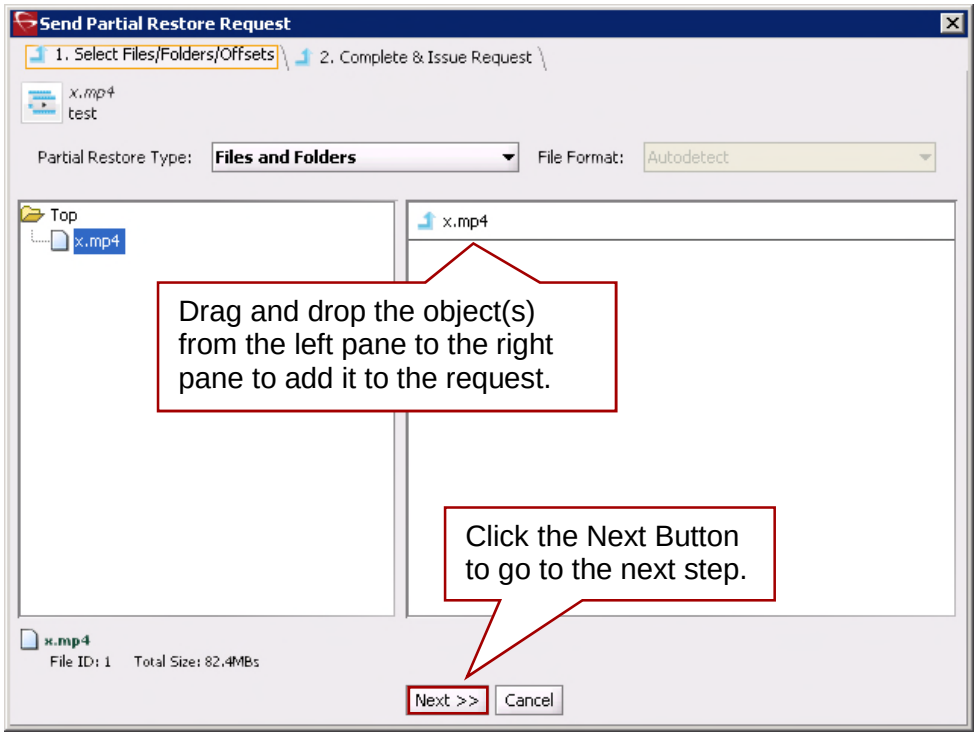


Figure 33: Byte Offset Partial Restore Options – Initial Window

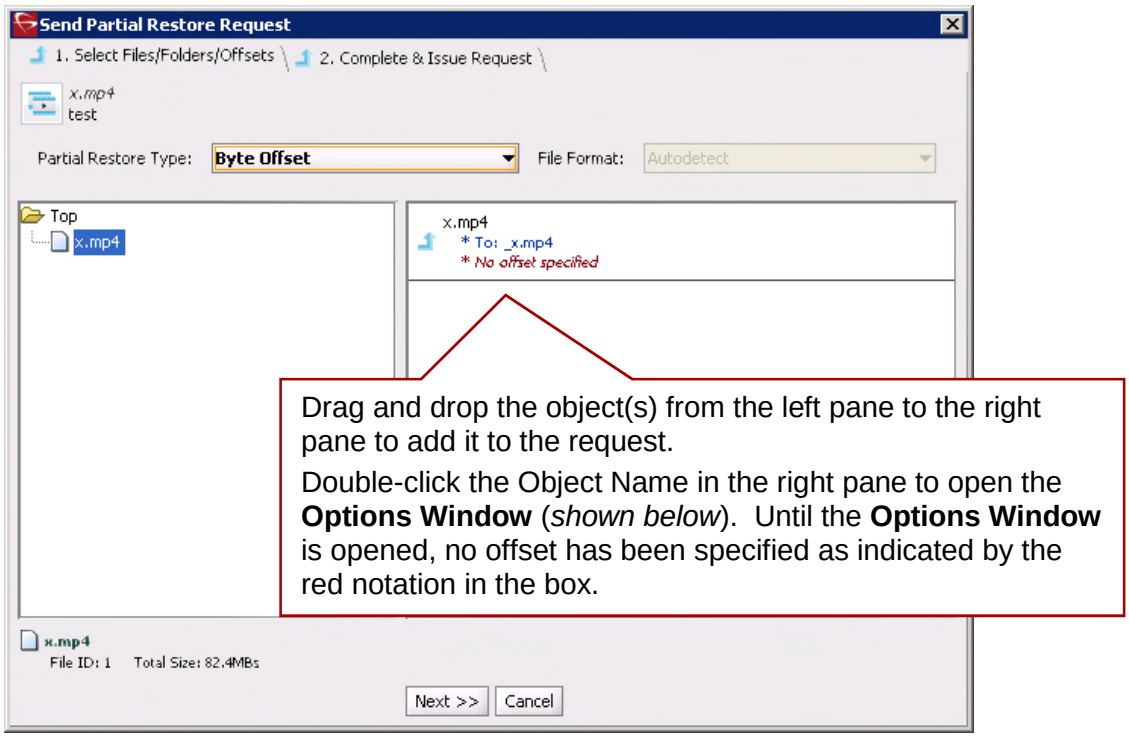
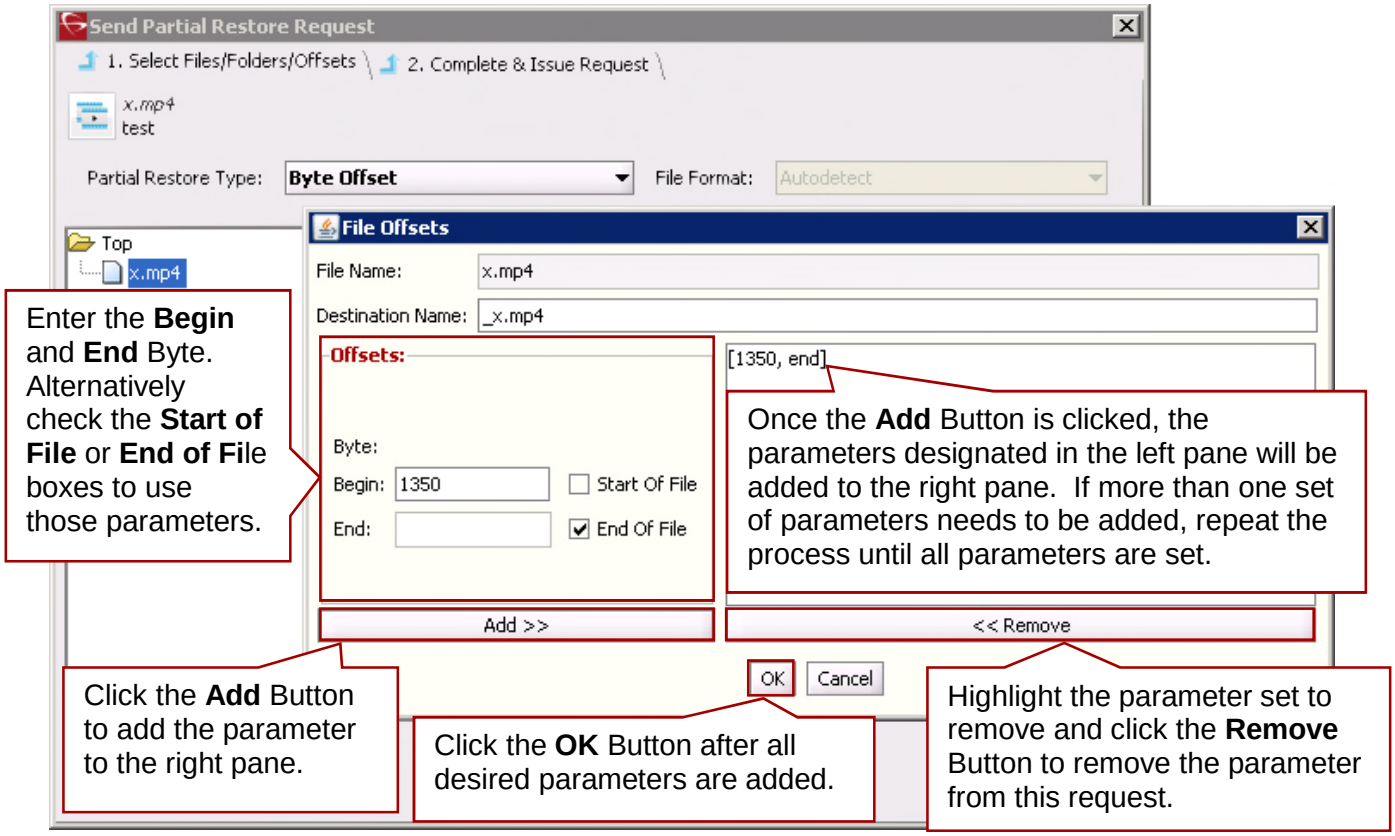


Figure 34: Byte Offset Partial Restore Options – Options Window



When the Timecode Partial File Restore Type is selected, the File Format pull-down box is enabled. Use the pull-down box to select the format of the object.

Figure 35: Timecode Partial Restore Options – Initial Window

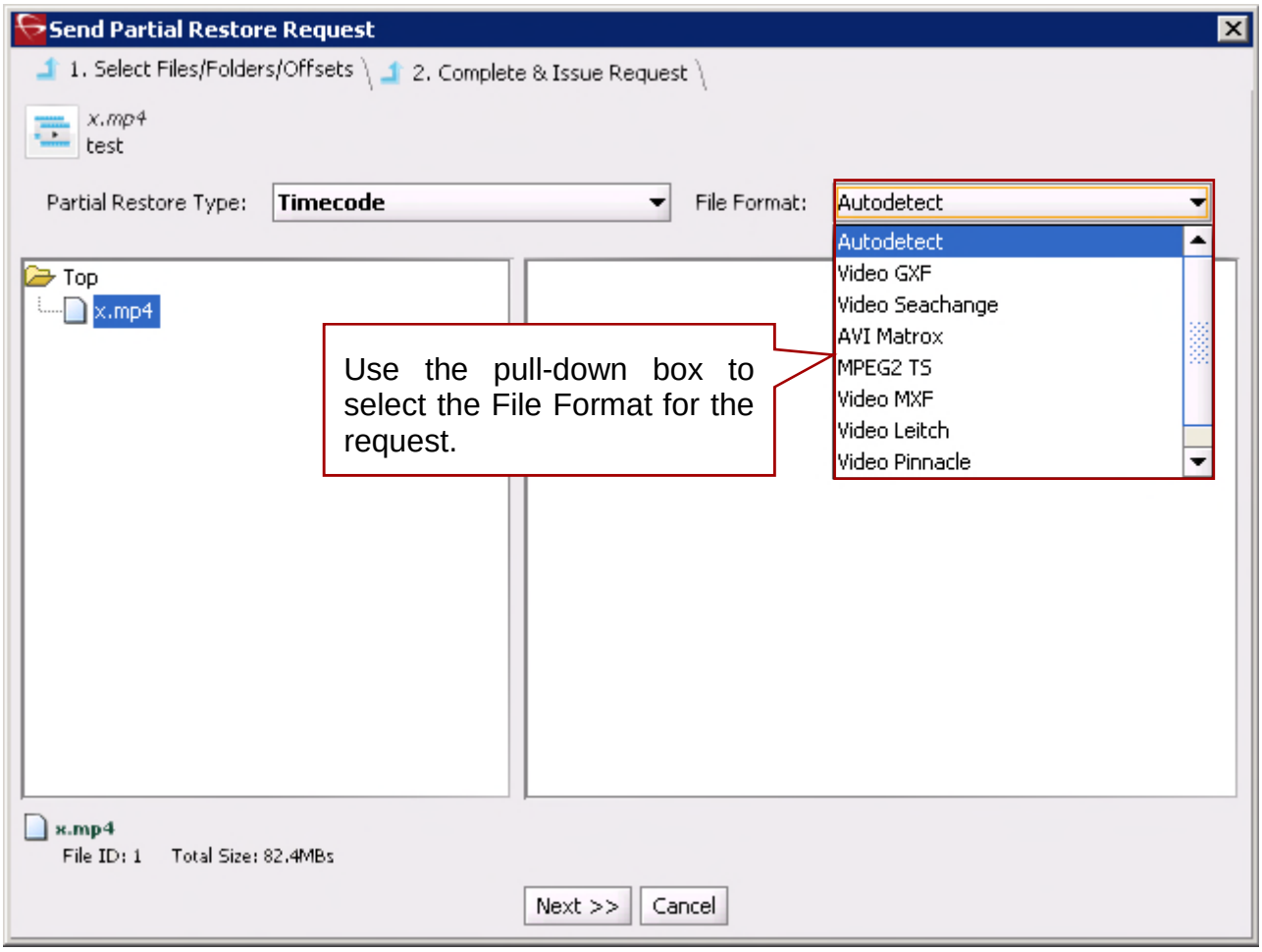


Figure 36: Timecode Partial Restore Options – Drag and Drop

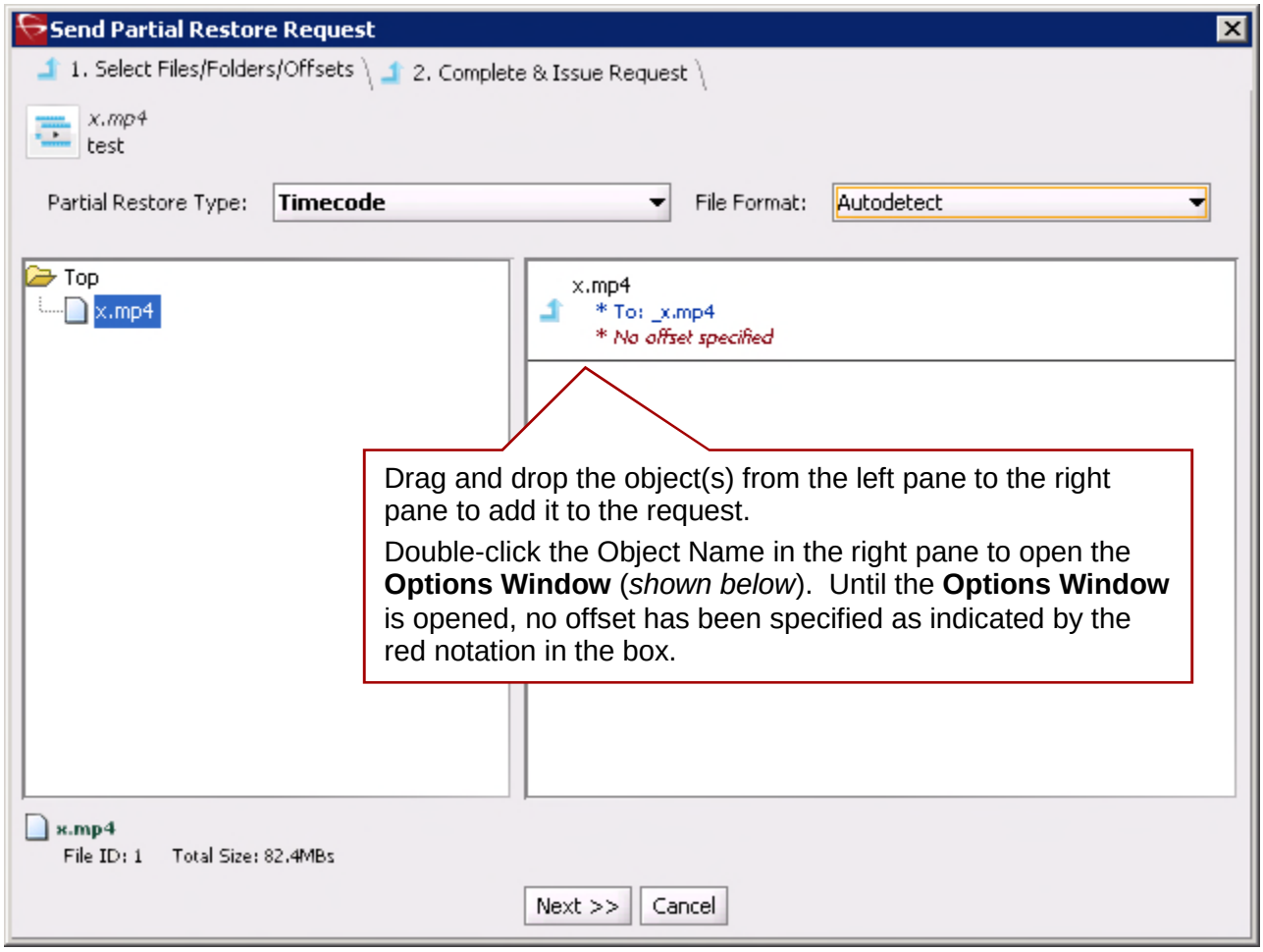


Figure 37: Timecode Partial Restore Options – Setting Offsets

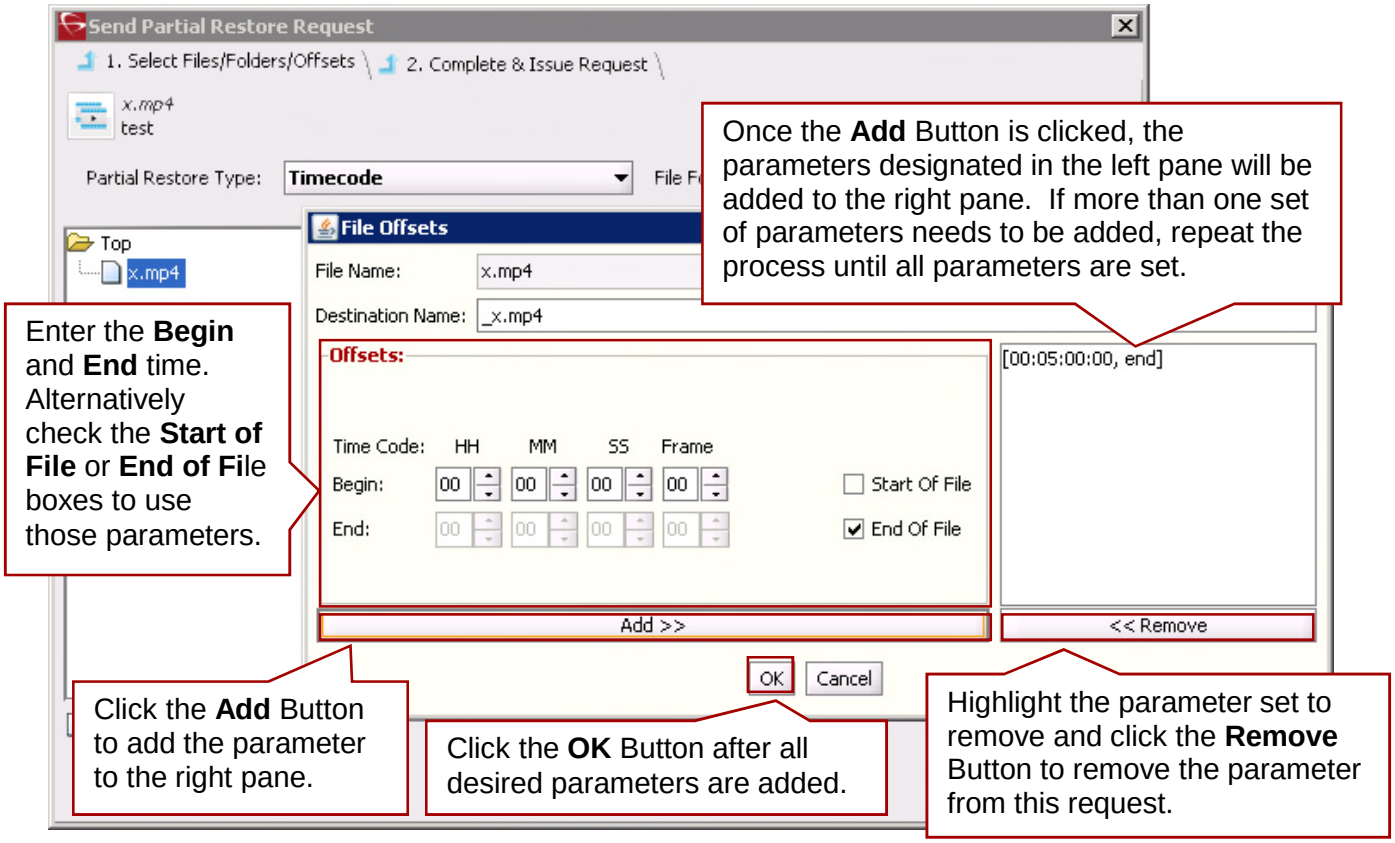


Figure 38: DPX Partial Restore Options – Initial Window

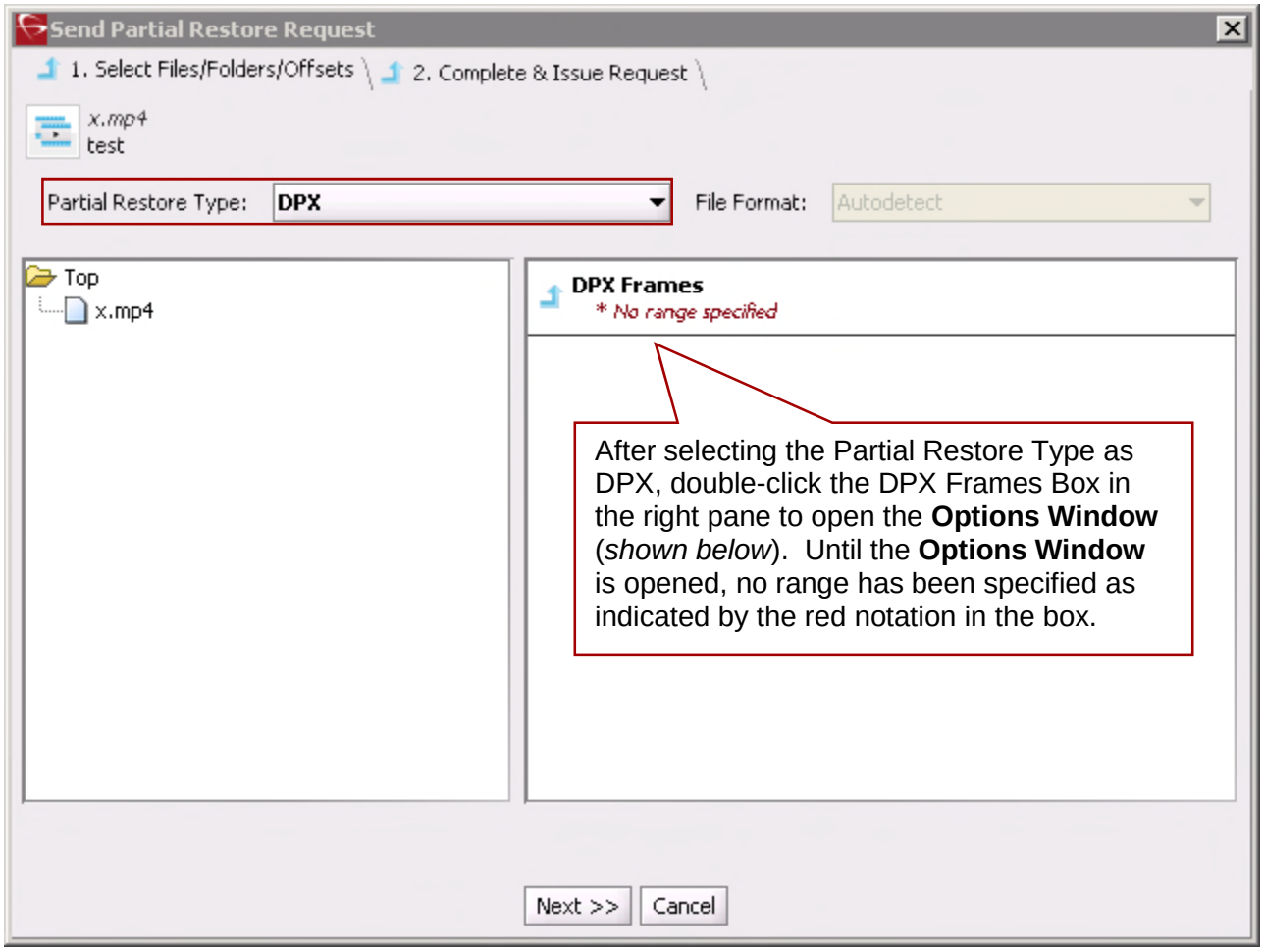
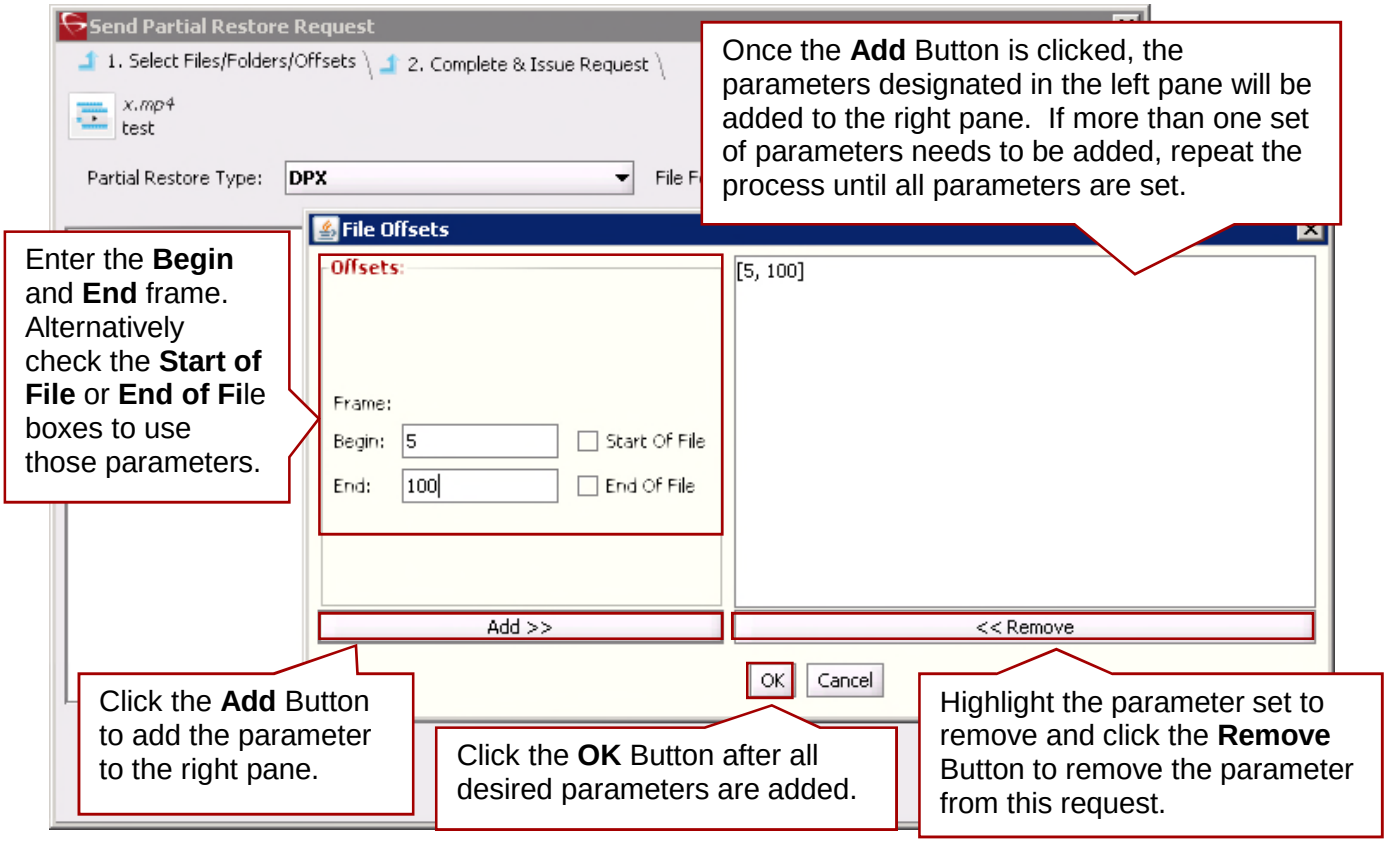
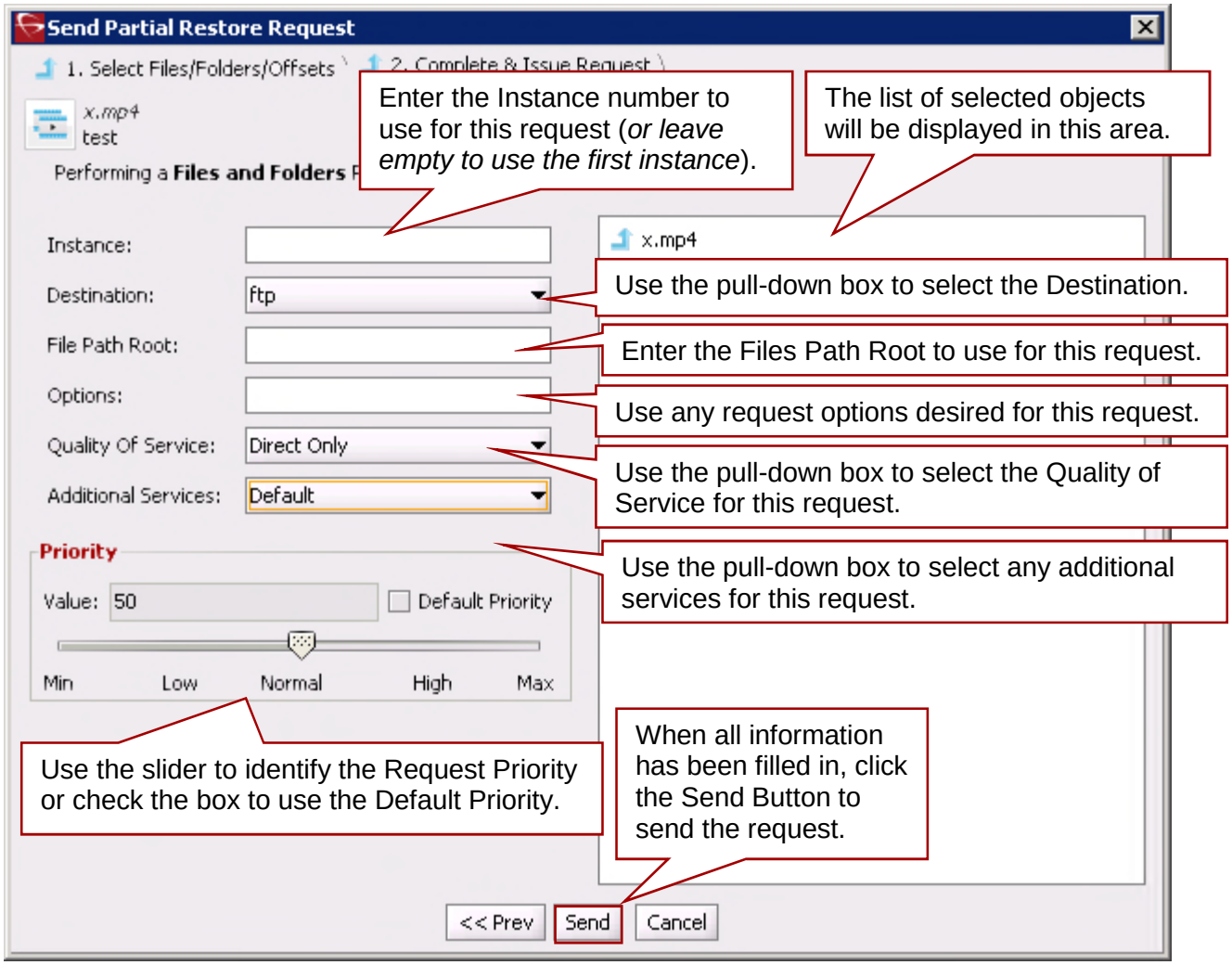


Figure 39: DPX Partial Restore Options – Options Window



After selecting the Partial File Restore Type and associated options for each object, click the **Next Button** to go to the final screen as shown in the figure below. Complete the required information on the final screen and click the **Send** button to send the request.

Figure 40: Partial Restore Request – Final Step



Note: Partial File Restore Requests for AVI format files must include the same offset range (*TCin, TCout*) for all object components (*e.g.* `clip.avi`, `clip_1.wav`, `clip_2.wav`).

Table 11: Send Partial Restore Request Window Parameters

Parameter	Description
Instance	If there are multiple instances of an object, DIVArchive will select the instance which will allow the request to complete in the least amount of time (*e.g. a disk instance will be selected over a tape instance*). Specifying an instance number in this field will override this behavior and target the specific instance.
Destination	Destination (e.g. video server or browsing server) to put the object files. This name must be known by the DIVArchive Configuration Description.
Files Path Root	Root folder on the destination where the object files will be placed. If left empty, the files will be placed in the FILES_PATH_ROOT folder specified when archiving the object.
Options	Additional options that must be used for performing the transfer of data from DIVArchive to the destination. These options supersede any options specified in the DIVArchive Configuration Database. Currently the possible Options values are: • No entry to specify no options. • -login: Login is used for some sources. This option obsoletes the –gateway option of the previous version. • -pass: Password used in conjunction with the –login option for some sources.
Quality of Service	One of the following codes: **DIVA_QOS_DEFAULT**: restoring is performed according to the default Quality Of Service (currently: direct restore). **DIVA_QOS_CACHE_ONLY**: Use cache restore only. **DIVA_QOS_DIRECT_ONLY**: Use direct restore only. **DIVA_QOS_CACHE_AND_DIRECT**: Use cache restore if available or direct restore if cache restore is not available. **DIVA_QOS_DIRECT_AND_CACHE**: Use direct restore if available or cache restore if direct restore is not available. Additional and optional services are available. To request those services, use a logical OR between the previously documented Quality Of Service parameter and the following constants: **DIVA_RESTORE_SERVICE_DO_NOT_OVERWRITE**: Do not overwrite existing files on the destination server.
Additional Services	Use the pull-down box to select whether or not DIVArchive will abort the request if the object already exists on the selected destination.

Parameter	Description
Priority	The level of priority for this request. The level can be in the range [0...100] or the Default Priority. The value 0 is the lowest priority and 100 the highest. There are five predefined values: • MIN • LOW • NORMAL • HIGH • MAX Move the slider to increase or decrease the request priority. If Default Priority is checked, the slider becomes inactive, and the priority configured in the DIVArchive configuration is used.

2.13.8 Multiple Restore (N-Restore)

If an object is required on a number of destinations simultaneously, the Multiple Restore, or **N-Restore,** Request allows you specify all of these destinations in one command and submit it as a single request (*as opposed to multiple standard restore requests for each destination*). This is also beneficial when the restore involves a tape instance; the tape is accessed once for the transfer rather than several read operations for single restore requests of the same object. Up to 5 simultaneous destinations are supported in the current version of DIVArchive.

If the object to be restored is part of a spanned tape set, it must be restored to cache prior to the transfer to all destinations. If the transfer to one of the destinations fails, the others will still proceed (*if possible*) and the request status will be partially aborted.

If multiple renaming rules are defined, DIVArchive will process the rule for each Source/Destination independently.

Note: The Multiple Restore (*N-Restore*) functionality is a purchasable option. Contact your Oracle Support Specialist for details on including Multiple Restore functionality in your system.

On the **Action Tab** of the Ribbon Bar, select the **Multiple Restore Button** to open the Multiple Restore Request Window.

Figure 41: Action Tab Ribbon Bar – Multiple Restore Button

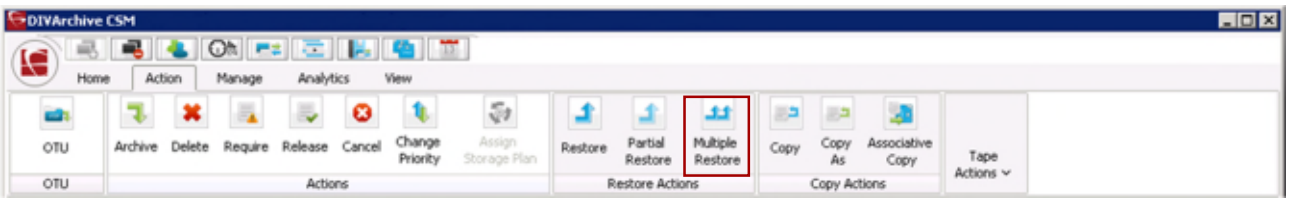
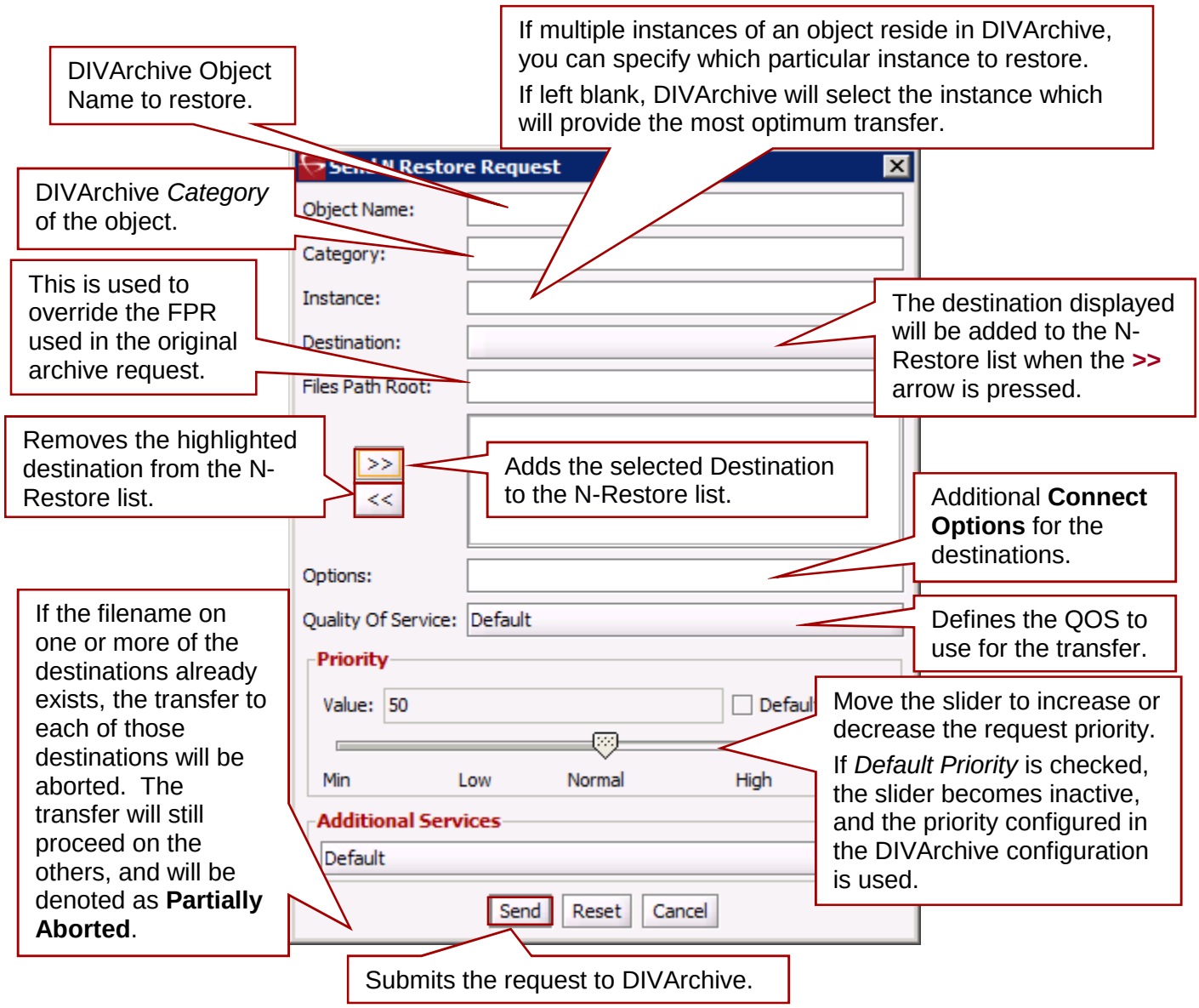


Figure 42: Send Multiple Restore (N-Restore) Window



2.13.9 Copy

Use the **Copy** command to create a new instance of an existing object in the same or another group or array. This is useful for creating a backup copy of the object on another media.

Submits a request for copying an archived object to a new object, with another name and/or category, to the DIVArchive Manager and the Manager chooses the appropriate instance as the source of the copy. All types of transfers (*Disk to Disk, Disk to Tape, Tape to Disk, and Tape to Tape*) are supported.

In the event the requested object is on media that is not available, the request will fail.

Note: When a Copy Request is issued with no instance specified, and there are multiple instances of that object, DIVArchive will select the instance that will execute the copy operation in the shortest possible time (*e.g. a disk instance will*

***be selected over a tape instance*). If an instance number is entered in the Instance field of the request, the copy operation will use that specific instance only.**

The **Copy** Request is initiated using the **Copy Button** on the Ribbon Bar, or the **Objects View** in the **Manage Tab** by right-clicking the object to copy and selecting **Copy** from the resulting menu as shown in the figure below.

Figure 43: Action Tab Ribbon Bar – Copy Button

Figure 44: Objects View Right-Click Menu (Copy)

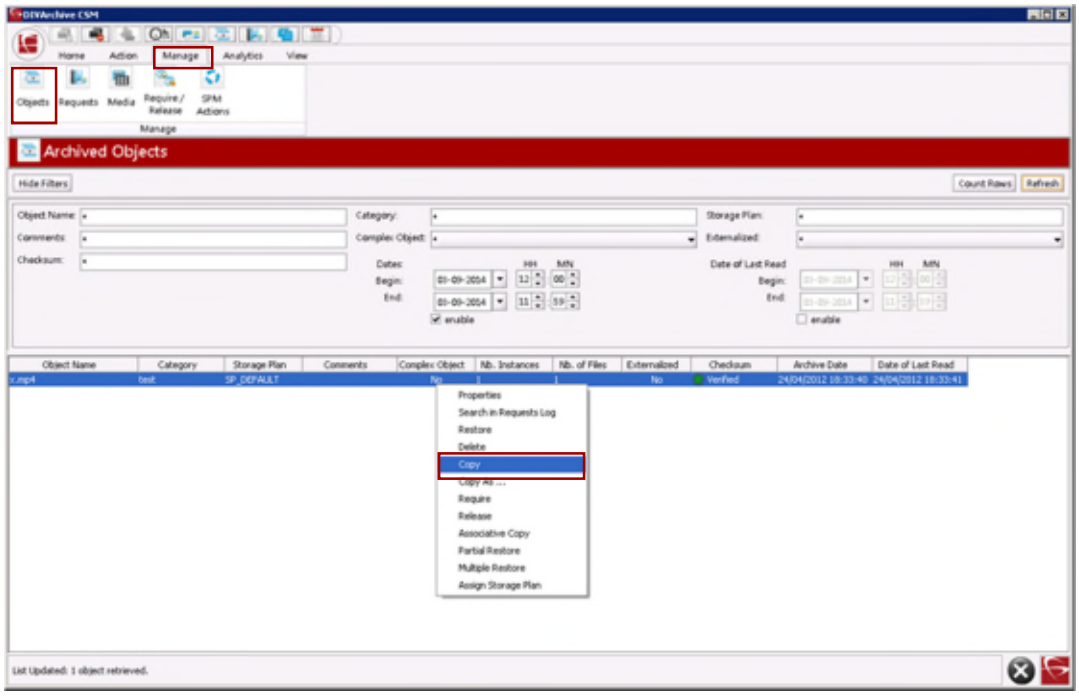


Figure 45: Copy Request Window

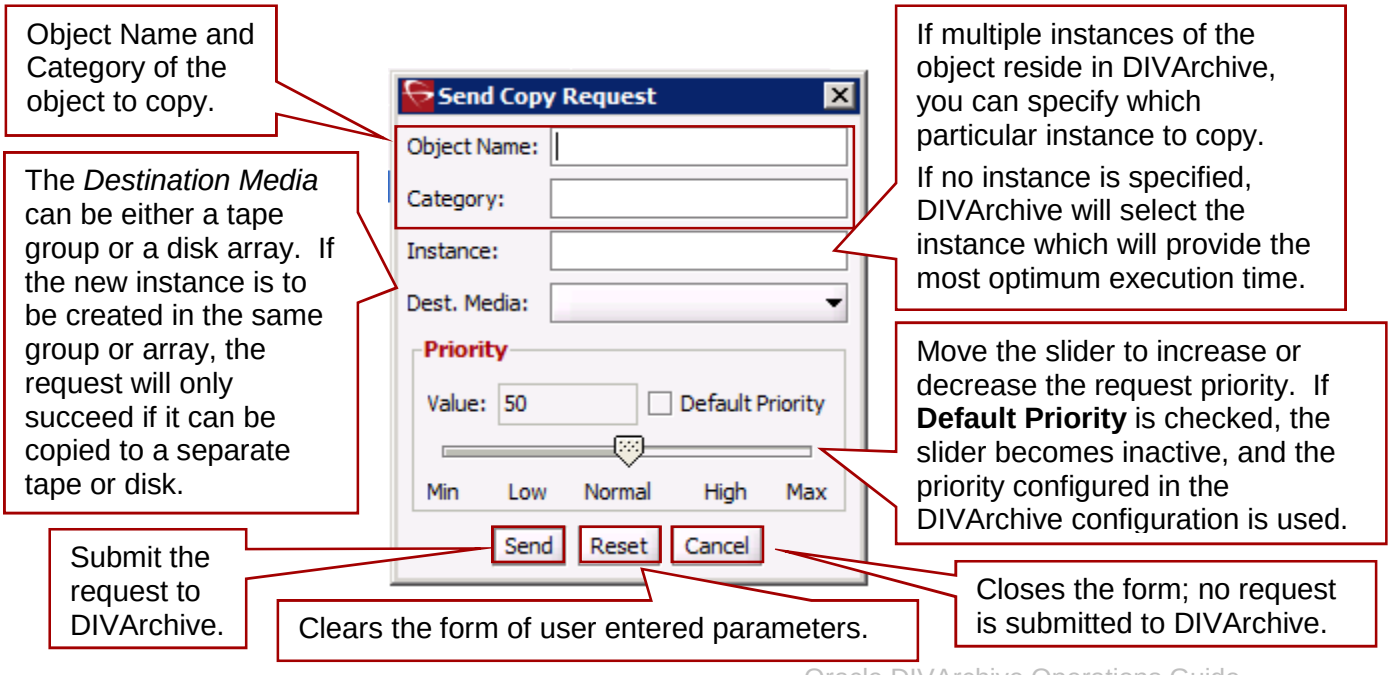


Table 12: Send Copy Request Window Parameters

Parameter	Description
Object Name	Source Object Name.
Category	Source Object Category.
Instance	If multiple instances of the object reside in DIVArchive, you can specify which particular instance to copy. If no instance is specified, DIVArchive will select the instance which will provide the most optimum execution time.
Destination Media	The **Destination Media** can be either a tape group or a disk array. If the new instance is to be created in the same group or array, the request will only succeed if it can be copied to a separate tape or disk.
Priority	The level of priority for this request. The level can be in the range [0...100] or the Default Priority. The value 0 is the lowest priority and 100 the highest. There are five predefined values: • MIN • LOW • NORMAL • HIGH • MAX Move the slider to increase or decrease the request priority. If Default Priority is checked, the slider becomes inactive, and the priority configured in the DIVArchive configuration is used.

2.13.10 Copy As

When an object is archived to DIVArchive it is uniquely identified by its **Object Name** and its **Object Category**. Neither the Object Name nor the Object Category can be altered once it exists within the DIVArchive Database. The **Copy As** command allows creation of a new object in DIVArchive with a new Object Name and/or Category, and the original object can then be deleted (*the latter must be performed manually*).

The **Copy As** Request is initiated using the **Copy As Button** on the Ribbon Bar, or the **Objects View** in the **Manage Tab** by right-clicking the object to copy as and selecting **Copy As** from the resulting menu as shown in the figure below.

Figure 46: Action Tab Ribbon Bar – Copy As Button

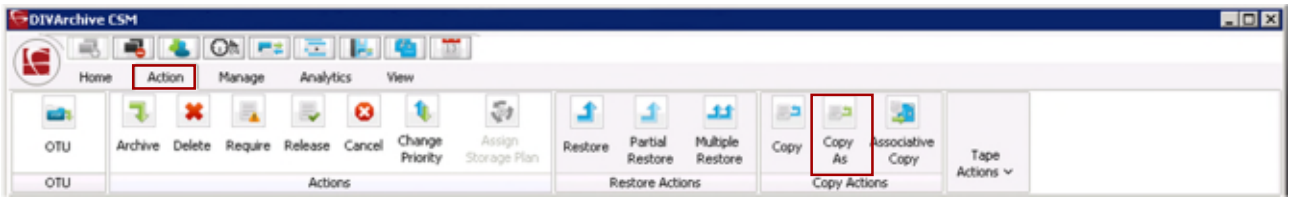


Figure 47: Objects View Right-Click Menu (Copy As)

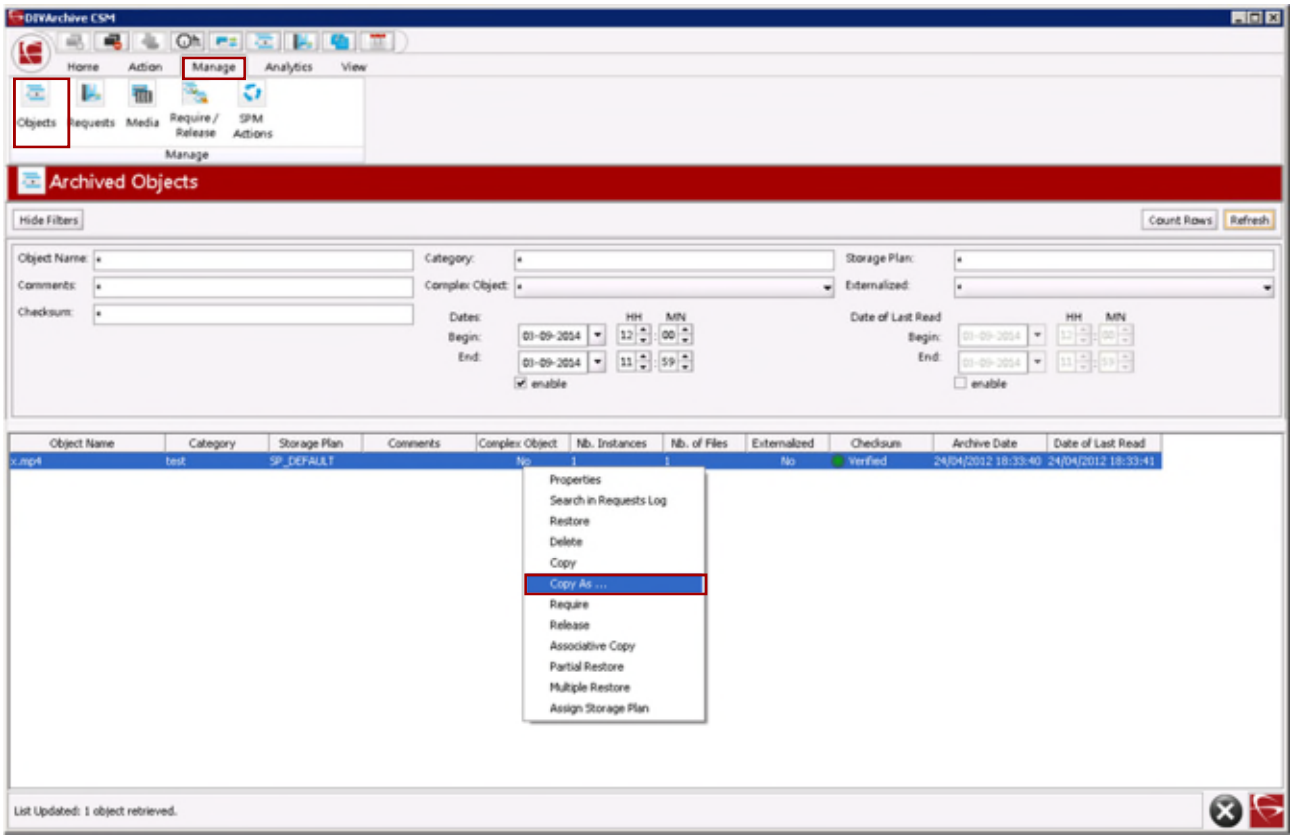
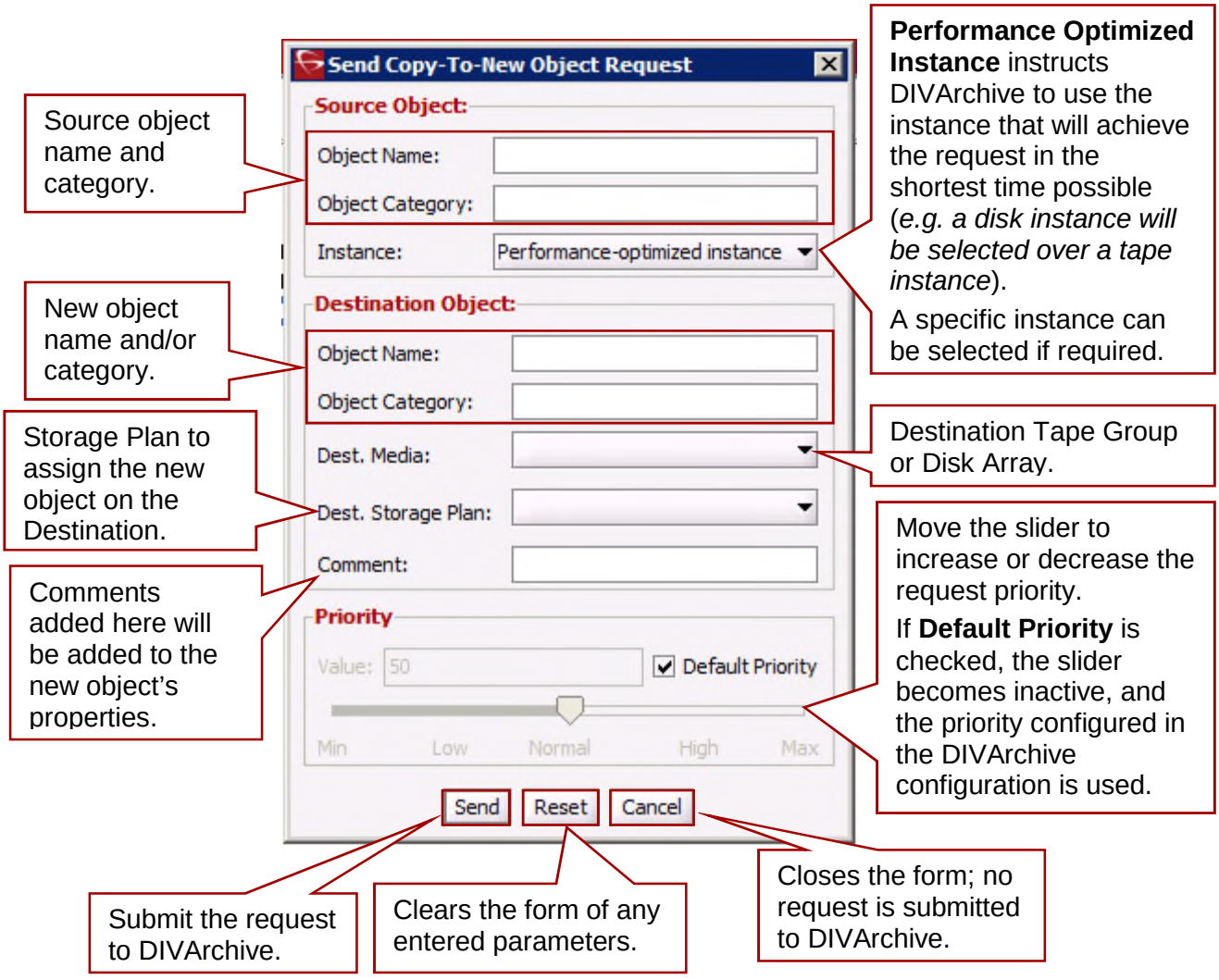


Figure 48: Copy As Request Window



For any DIVArchive Object, the Object Name may not necessarily match that of the filename of the essence stored within it. If you use the **Copy As** command to create a new DIVArchive Object, it will still be restored using the same name with which it was originally archived.

Example:

If a file named *xyz* is archived from a server, regardless of what object name given to it in DIVArchive, it will always restore to a destination as *xyz* regardless of its DIVArchive Object Name.

When a **Copy As** request is issued directly from the **Objects View**, the Instance field of the request is automatically left empty (*an Instance number may be manually entered before the request is issued*). If this field is left empty when the request is submitted and there are multiple instances of that object, by default DIVArchive will select the instance that will complete the transfer in the shortest possible time (*i.e. a disk instance will be selected over a tape instance*). This is dependent upon the QOS specified and the DIVArchive configuration.

When the **Copy As** request is issued from with the **Object Properties View** the Instance field of the request is automatically updated with the number of the selected instance, and will copy that specific instance only.

Note: Commands that are issued from the Objects Properties View must always specify an Instance Number.

2.13.11 Associative Copy

The **Associative Copy** request works in conjunction with the **Archived Objects View** and allows you to copy multiple objects sequentially to a single tape in a specified group. An example of its use is backing up the selected objects to a single tape so it can subsequently be externalized.

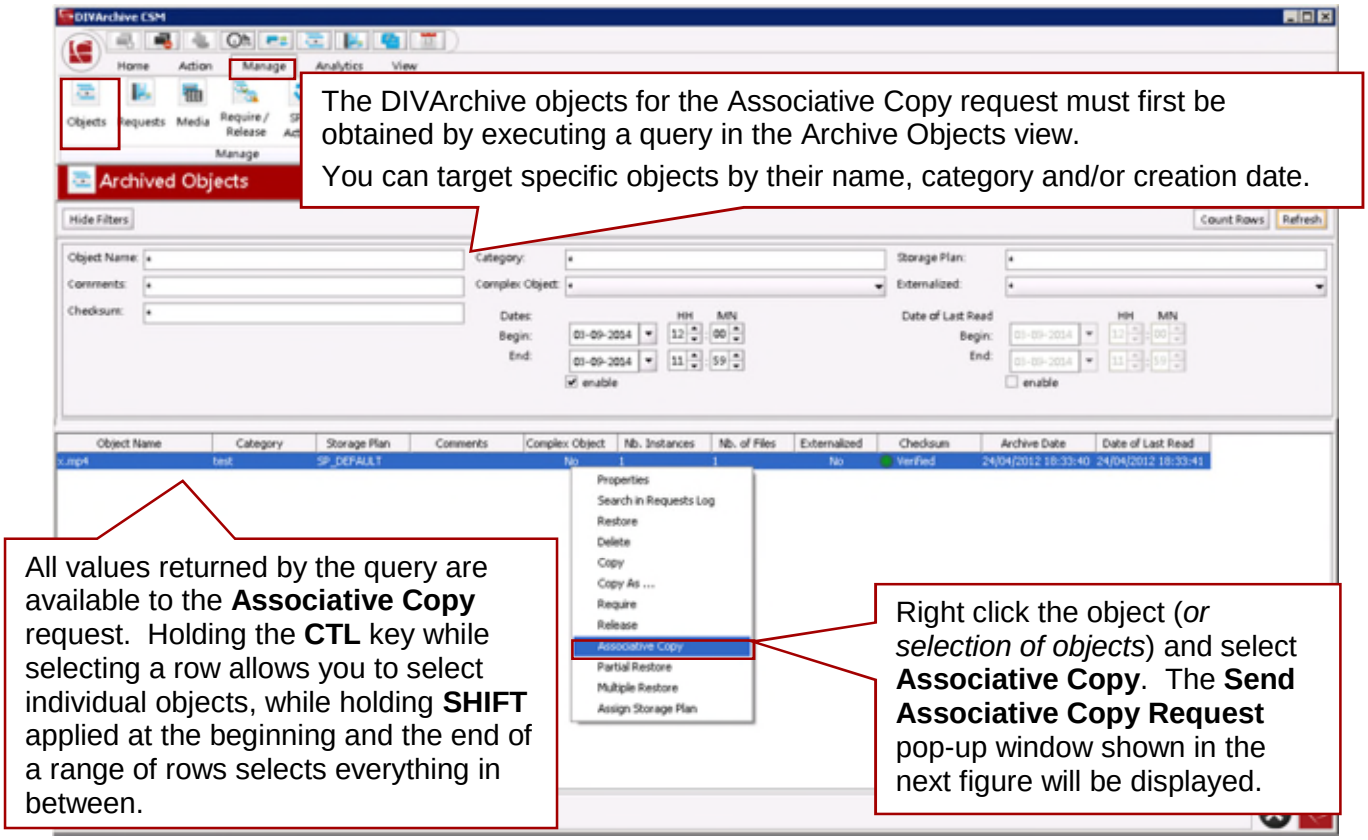
Associative copying involves reading and writing files from the source group(s) to the destination group one file at a time. DIVArchive guarantees that these instances are stored sequentially on tapes:

- It is not compatible with tape spanning; if no tape is currently available for copying all of the selected objects to a single tape. The request aborts (*and is retried once*) instead of spanning. If the sum of the size of the objects to copy exceeds the capacity of every individual tape present in the library, the request aborts.
- Two or more instances of an object on the same tape are not permitted. This may reduce the range of tapes that can be selected for the Associative Copy. If no appropriate tape is available to meet this condition, the request will be aborted.
- The request is completed only when every object has been copied onto the same tape.
- In the case of drive or tape failure during a write operation, instances currently written are erased and the request is retried once.
- Choice of the tape to be used for the copy follows the policy used for the archive operation (*written tapes with enough remaining size regardless of optimizations*).

The **Associative Copy** Request is initiated using the **Associative Copy Button** on the Ribbon Bar, or the **Objects View** in the **Manage Tab** by right-clicking the object to copy and selecting **Associative Copy** from the resulting menu as shown in the figure below.

Figure 49: Action Tab Ribbon Bar – Associative Copy Button

Figure 50: Objects View Right-Click Menu (Associative Copy)



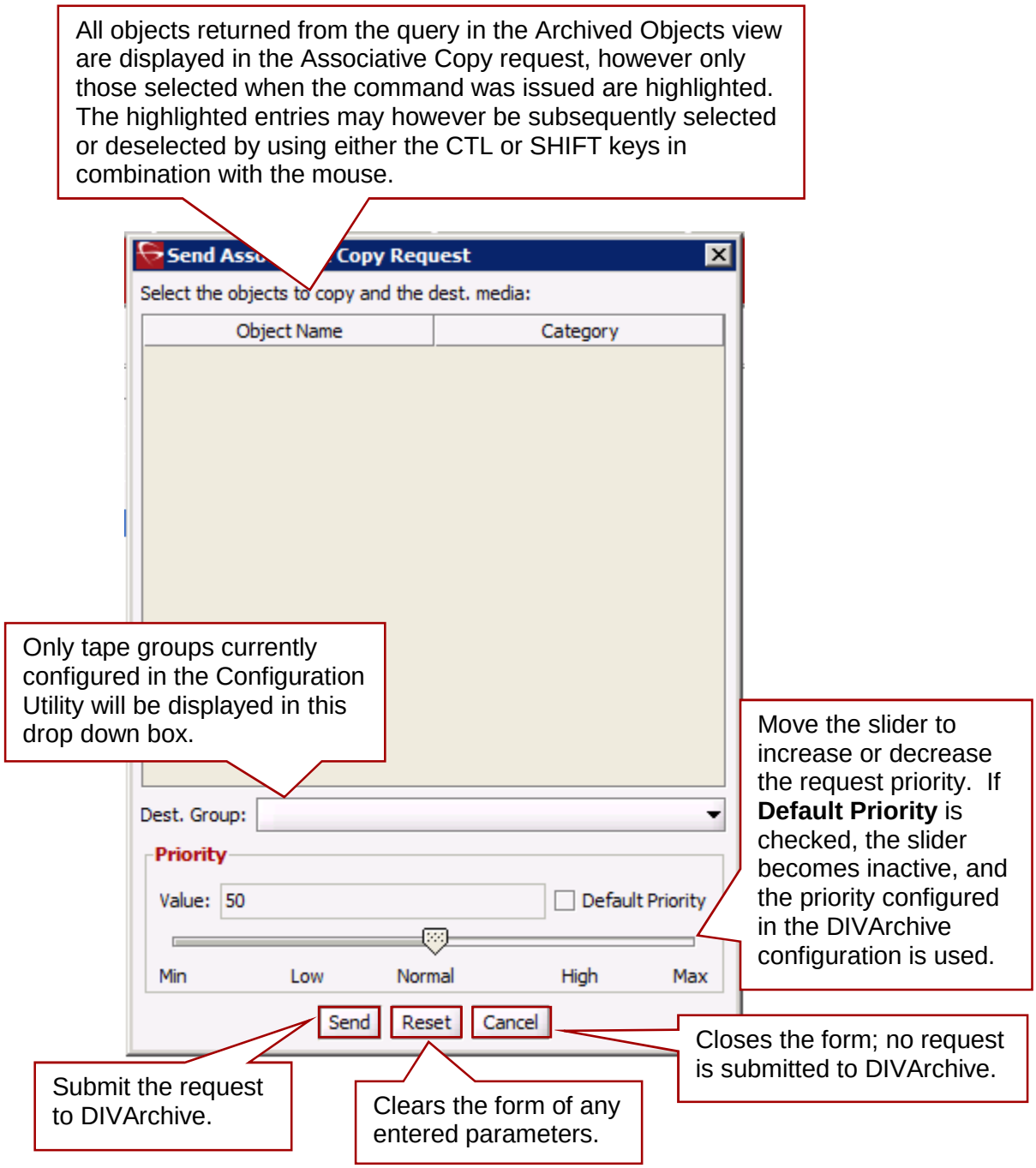
The DIVArchive objects for the Associative Copy request must first be obtained by executing a query in the Archive Objects view.

You can target specific objects by their name, category and/or creation date.

All values returned by the query are available to the **Associative Copy** request. Holding the **CTL** key while selecting a row allows you to select individual objects, while holding **SHIFT** applied at the beginning and the end of a range of rows selects everything in between.

Right click the object (*or selection of objects*) and select **Associative Copy**. The **Send Associative Copy Request** pop-up window shown in the next figure will be displayed.

Figure 51: Send Associative Copy Request Window



2.13.12 Repack Tape

The **Repack Tape** request sends a repack request for the selected or specified tape. A tape repack reclaims unusable space on a tape due to object deletions and remove fragmentation.

Tape repacking can be a lengthy process and DIVArchive (*by default*) considers tape repacks a low priority operation. As such, if higher priority requests are issued, a tape repack request can be temporarily suspended while the higher priority requests are completed. If the higher priority requests are issued sporadically, this can result in frequent mount and dismount operations of the drive performing the repack. It is recommended that Tape Repack operations should be run during off-peak periods where the frequency of new (*higher priority*) requests is limited. Some installations may have a drive dedicated solely to tape repacking to prevent this scenario from occurring.

The repack process involves:

1. Mounting the source tape and reading all objects to temporary disk cache of an Actor enabled for repack operations.

   Note: If the temporary disk cache is filled prior to reading all objects from the source tape, DIVArchive will begin proceed to Step 2 until the cache is cleared. It will then proceed to read the remaining objects from the source tape and so on.

2. Mounting a tape from the **Unused Tapes Sets** pool associated with the Set ID of the group from the source tape.
3. Writing all objects from the temporary cache in Step 1.
4. Deleting the objects from the temporary cache after all objects have been successfully written to the new tape.
5. The original source tape will be released to the **Unused Tapes Sets** pool, and be unassigned from the group.

If a read error occurs at some point during the repack process from the source tape, or a write error occurs on the destination tape, the entire repack request is aborted and no objects from the source tape are deleted. If the cache had been filled during the repack request, and objects were successfully written to another tape before the cache was cleared, these objects will remain on the destination tape. If a read error has occurred, the source tape will have both its repack status and write status disabled. If a write error occurred, the destination tape will have its write status disabled, and will not be used for any tape write operations. The write and repack states of both tapes can be examined in the **Tape States** frame of the Configuration Utility.

Notes:

- **The Repack Tape function is NOT intended to move material from a tape that is already known to be generating read errors. Contact Oracle Technical Support for advice in these situations.**
- **During the manual repack of a WORM Media, the usual pop-up displays; however a warning is included notifying the user that the space on the source media will not be recoverable after the repack is complete.**
- **Deletes and Repacks do not clear WORM Media as these are Write-Once media. The instances are deleted, but the space is not recoverable.**

The **Repack Tape** Request is initiated using the **Repack Tape Button** on the Ribbon Bar, or the **Tapes View** in the **Home Tab** by right-clicking the tape to repack and selecting **Repack Tape** from the resulting menu as shown in the figure below.

Figure 52: Action Tab Ribbon Bar – Repack Tape Button

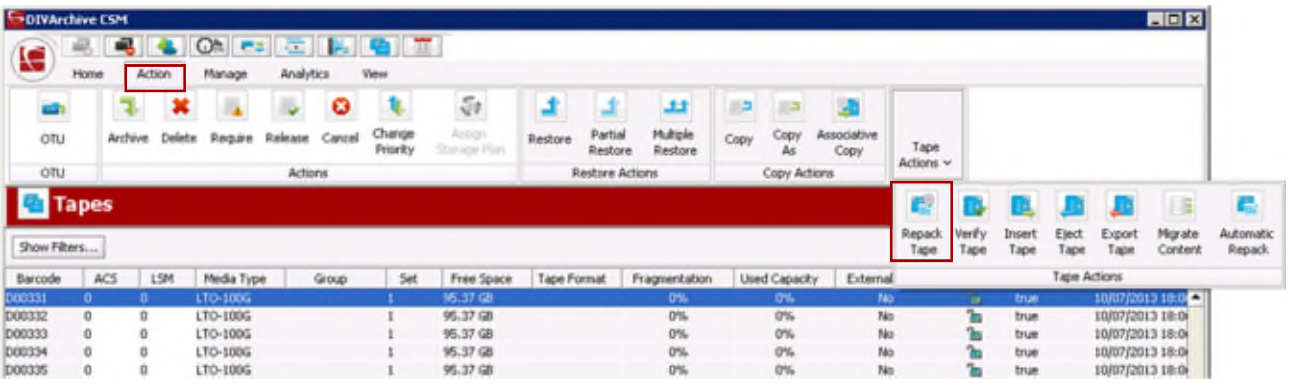


Figure 53: Tapes View Right-Click Menu (Repack Tape Menu)

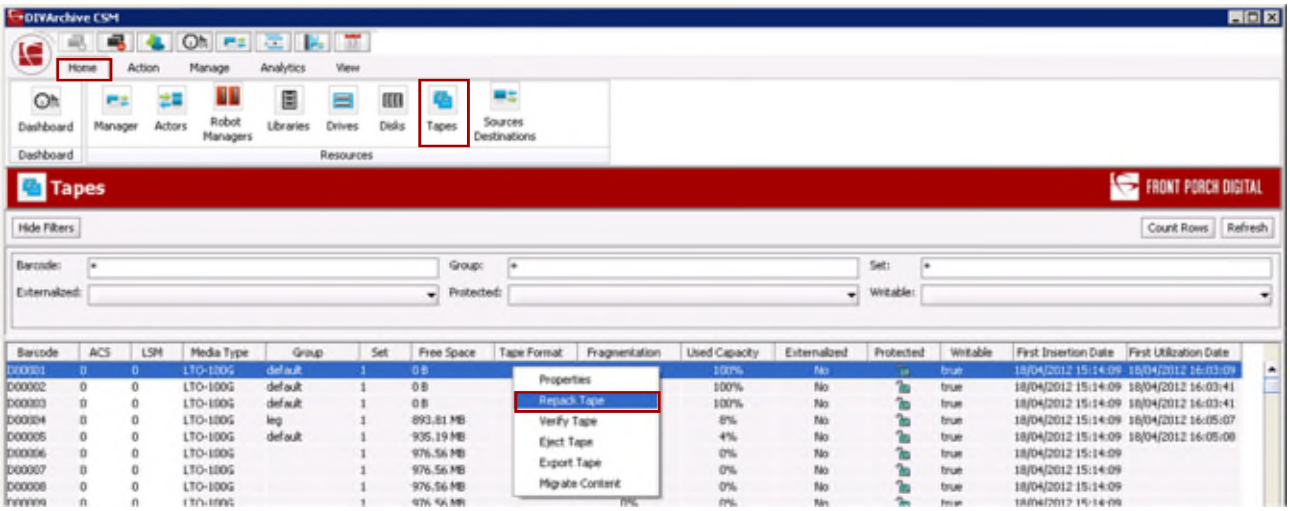
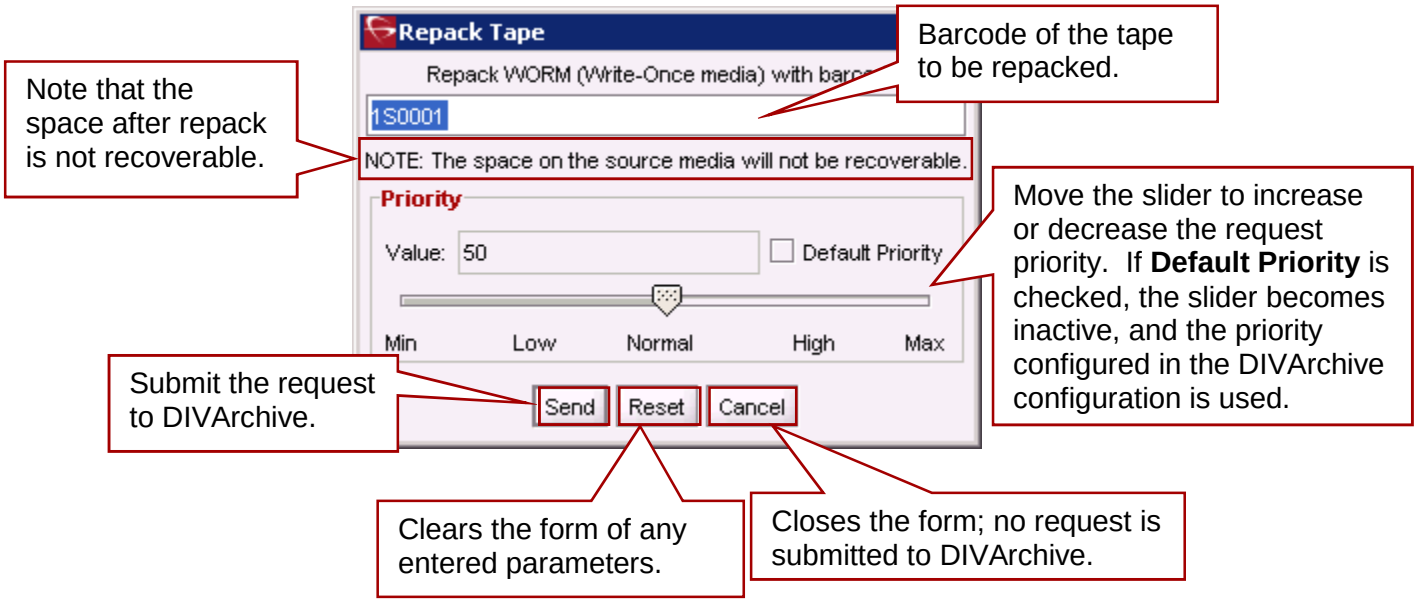


Figure 54: Repack Tape Request Window



2.13.13 Verify Tape

The Verify Tape Request initiates a system read-back through every object on the selected tape one at a time and verifies all of the checksum values

The **Verify Tape** Request is initiated using the **Verify Tape Button** on the Ribbon Bar, or the **Tapes View** in the **Home Tab** by right-clicking the tape to repack and selecting **Verify Tape** from the resulting menu as shown in the figure below.

Figure 55: Action Tab Ribbon Bar – Verify Tape Button

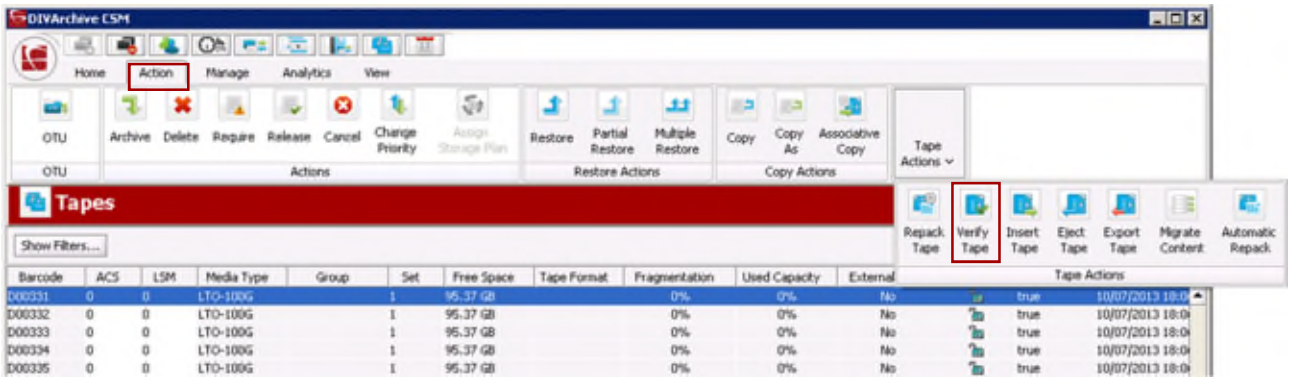


Figure 56: Tapes View Right-Click Menu (Verify Tape Menu)

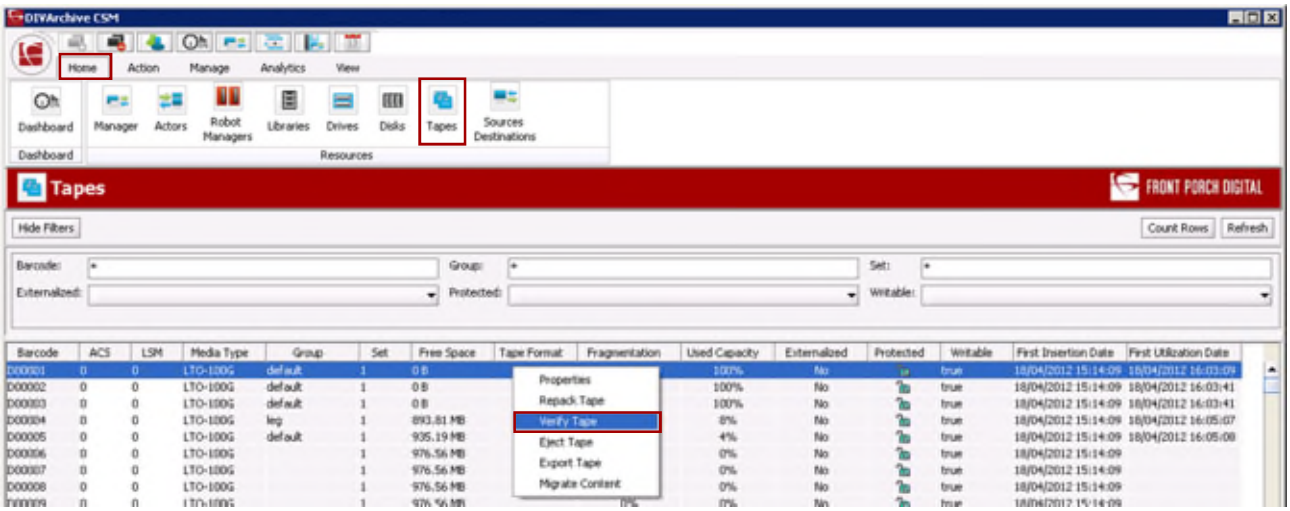
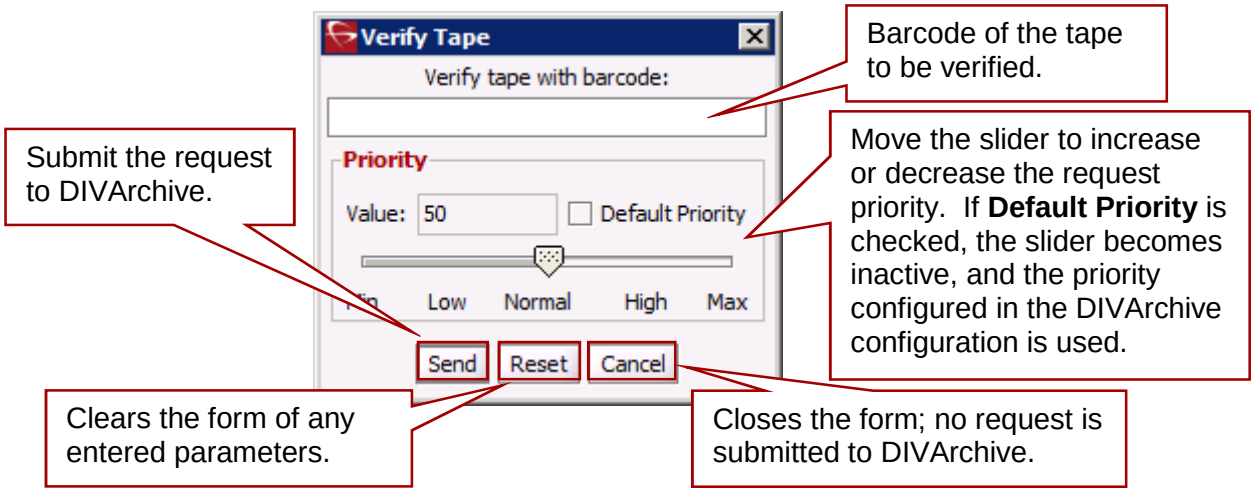


Figure 57: Verify Tape Request Window



2.13.14 Insert Tape

This request allows a tape to be inserted into a library through its **Cartridge Access Port** (*CAP*). Some library configurations only allow you to enter the tape(s) in the CAP **after** this command is issued.

For instructions on bulk loading of tapes to a library, contact your Oracle Support Specialist.

The **Insert Tape** Request is initiated using the **Insert Tape Button** on the Ribbon Bar.

Figure 58: Action Tab Ribbon Bar – Insert Tape Button

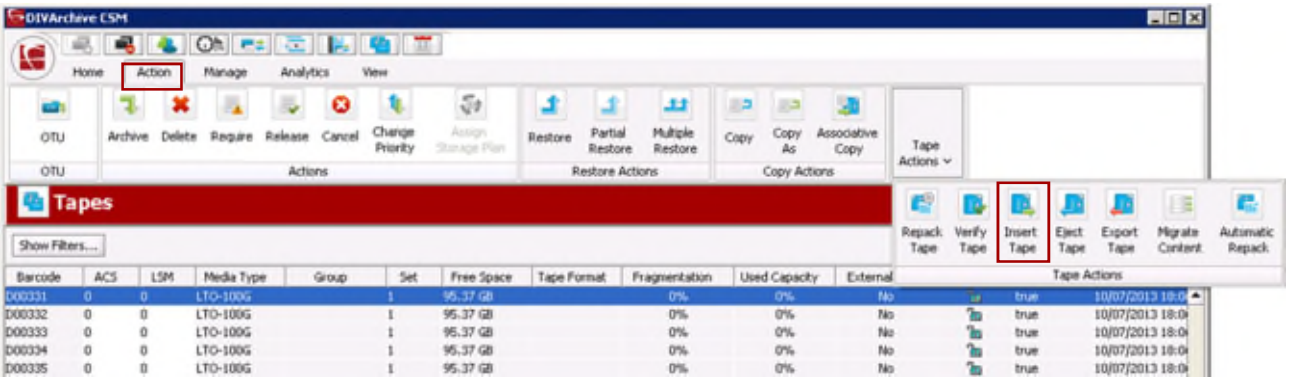
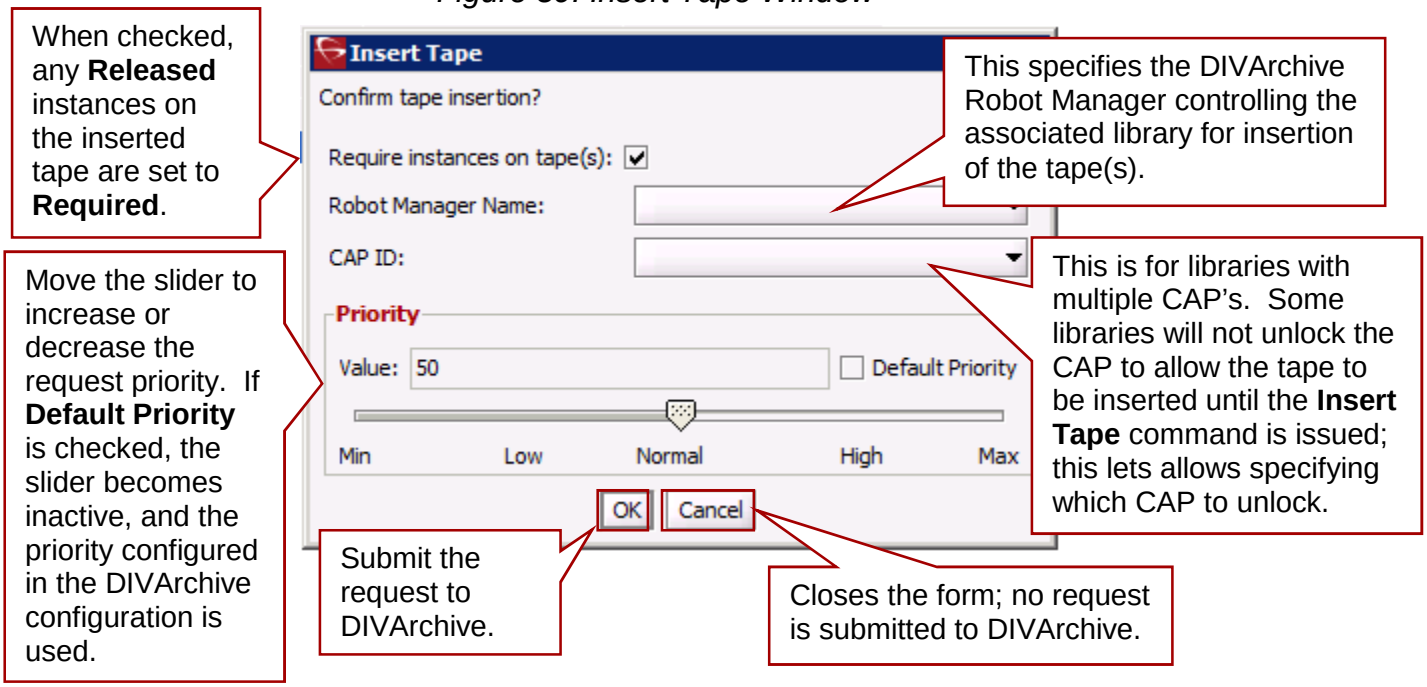


Figure 59: Insert Tape Window



Note: The Sony PetaSite PSC software allows you to enter a tape in its CAP and manually place it within the PetaSite. In this case, DIVArchive is not informed by the PSC that this has been done and will not recognize the tape until an audit is done on the library using the Configuration Utility.

2.13.15 Eject Tape

The **Eject Tape** request will eject the selected tape(s) from the associated library (*one or more tapes can be selected simultaneously*).

The **Eject Tape** Request is initiated using the **Eject Tape Button** on the Ribbon Bar, or the **Tapes View** in the **Home Tab** by right-clicking the tape to eject and selecting **Eject Tape** from the resulting menu as shown in the figure below.

Figure 60: Action Tab Ribbon Bar – Eject Tape Button

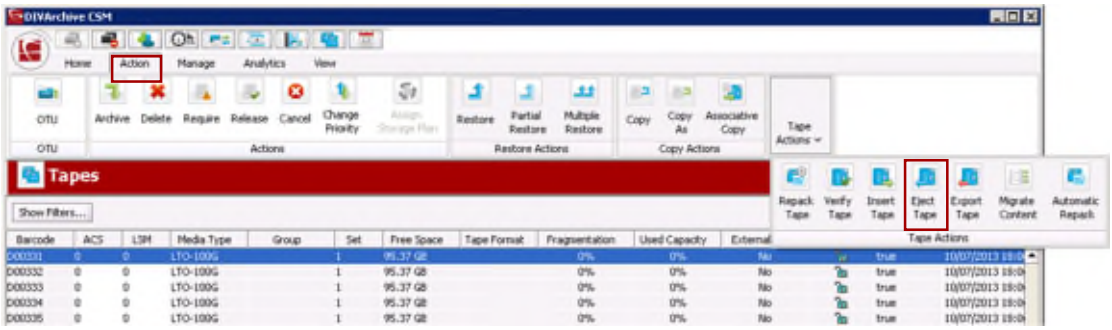


Figure 61: Tapes View Right-Click Menu (Eject Tape Menu)

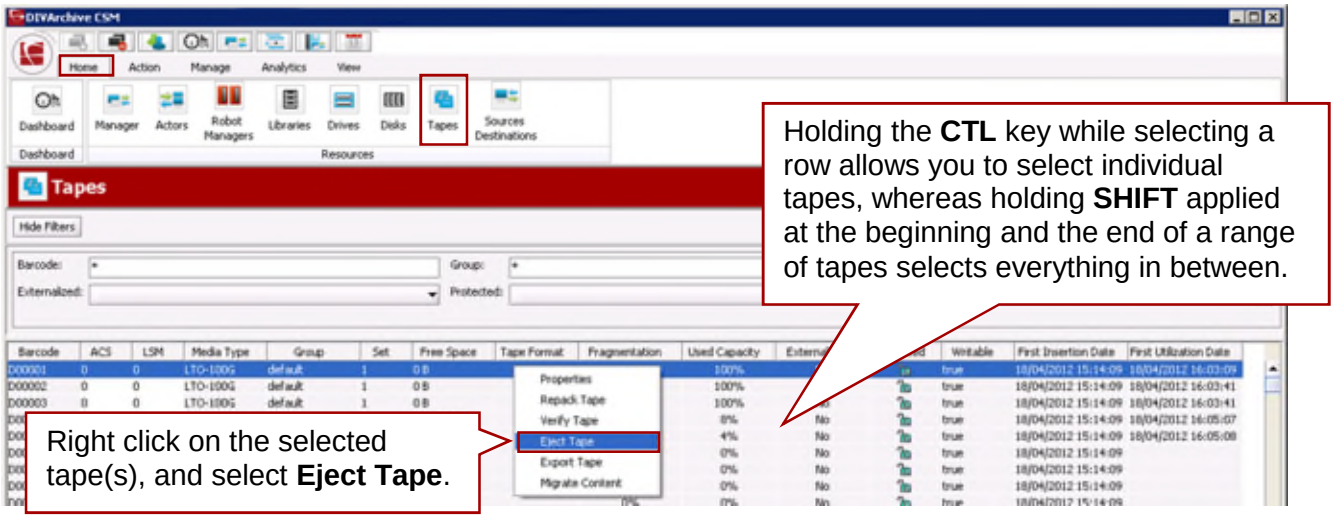
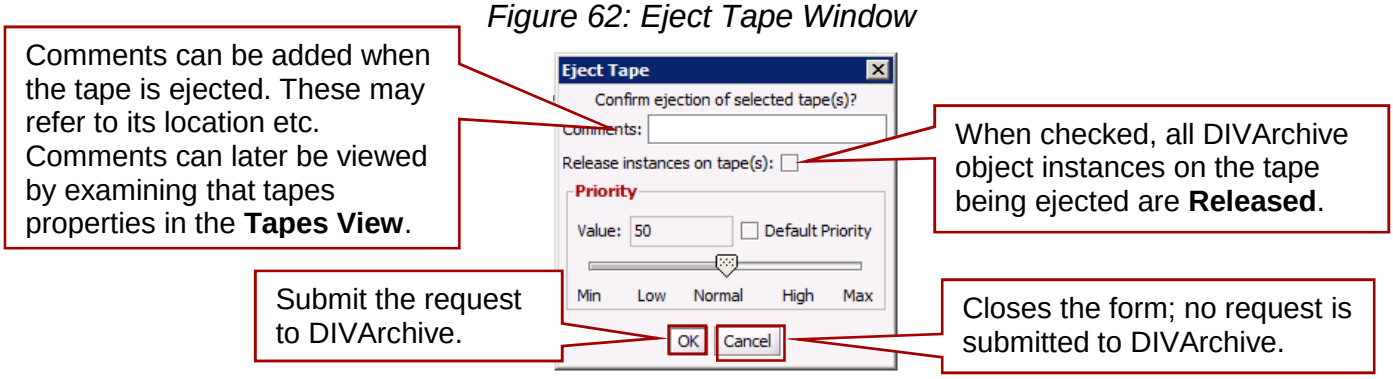


Figure 62: Eject Tape Window



2.13.16 Export / Import Tape

The **Export Tape** request type allows one or more tapes containing DIVArchive Objects to be exported to another independent DIVArchive platform (*e.g. at a remote disaster recovery or partner site*).

The **Metadata** of each tape (*i.e. the Object Names and Categories it contains and their location on the tape itself*) are maintained in the DIVArchive Oracle Database, and for Complex Objects, also in the Metadata Database. The metadata of each tape is also saved to an XML file when the tape(s) are exported. This XML file is then used to transfer the metadata of each tape into the other DIVArchive platforms database when the tape(s) are imported.

Note: The Export Tapes command is NOT used for transferring tapes between two or more libraries controlled by the same DIVArchive Manager. Tapes (*and the instances they contain*) that are exported from DIVArchive using this command are also removed from the DIVArchive Database when exported. If the object(s) being exported is the last, or only, instance of that object it will be removed entirely from the database.

The following new parameters have been added for Export and Import Tape functions. All XML Metadata Files exported from all previous DIVArchive versions will **not** continue to be supported.

During an Export/Import of WORM Media, whether or not the media is Write-Once and whether or not the media is a cartridge is identified in the exported XML file. This information is imported as well with the attributes **`isWriteOnce`** and **`isCartridge`** being either **`true`** or **`false`**.

Importing of WORM Media is supported by DIVArchive 7.2 and later; however, if an import of a DIVArchive 7.2 (*or later*) export that contains WORM Media into an older DIVArchive version (*pre-7.2*), the WORM will be ignored (*set to* `false`) and logged in the Manager log. The device will be seen in the Control GUI as a Tape but not usable if finalized or no WORM Drive is connected to the system.

Table 13: Export and Import Parameters

Parameter	XML Element/Attribute	Notes
`objectId`	Attribute of the object element	Not imported. A new Object ID is generated during import.
`uuid`	Attribute of the object element	Imported if present, otherwise a new UUID will be generated.
`numFolders`	Attribute of the object element	
`Format`	Attribute of the object element and Attribute of the Tape element.	0 = Legacy 1 = AXF -1 = Unknown
`numFolders`	Attribute of the object element	

Parameter	XML Element/Attribute	Notes
isHeaderValid	Attribute of the object element	
isComplex	Attribute of the object element	
footerBeginPos	Attribute of the element.	If exists in Database.
footerEndPos	Attribute of the element.	If exists in Database.
compOrderNumBegin	Attribute of the element.	If exists in Database.
compOrderNumEnd	Attribute of the element.	If exists in Database.
fileFolderMetadataInfo	Element	Valid for Complex Objects.
fileFolderMetadataInfo-elem	Element	Valid for Complex Objects.
checksums and checksum	Element	NOT valid for Complex Objects.

The **Export Tape** Request is initiated using the **Export Tape Button** on the Ribbon Bar, or the **Tapes View** in the **Home Tab** by right-clicking the tape to export and selecting **Export Tape** from the resulting menu as shown in the figure below.

Figure 63: Action Tab Ribbon Bar – Export Tape Button

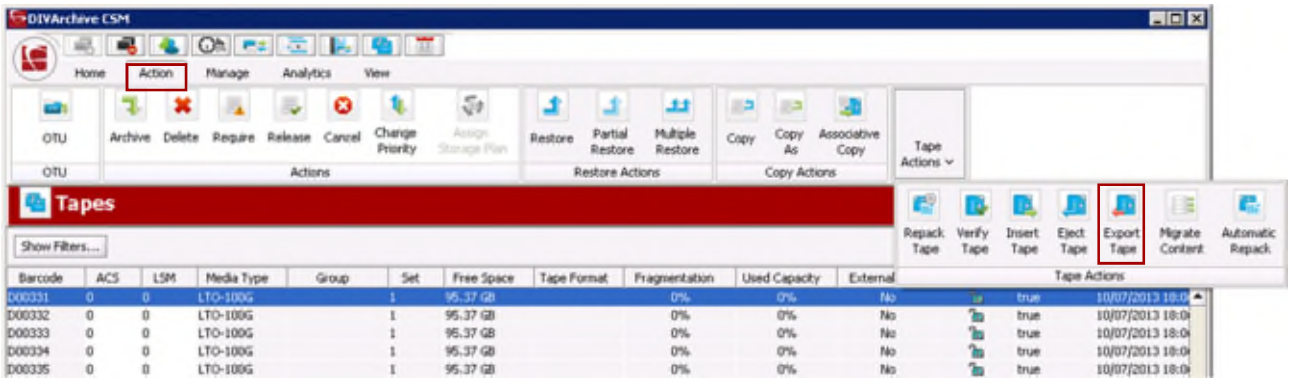


Figure 64: Tapes View Right-Click Menu (Export Tape Menu)

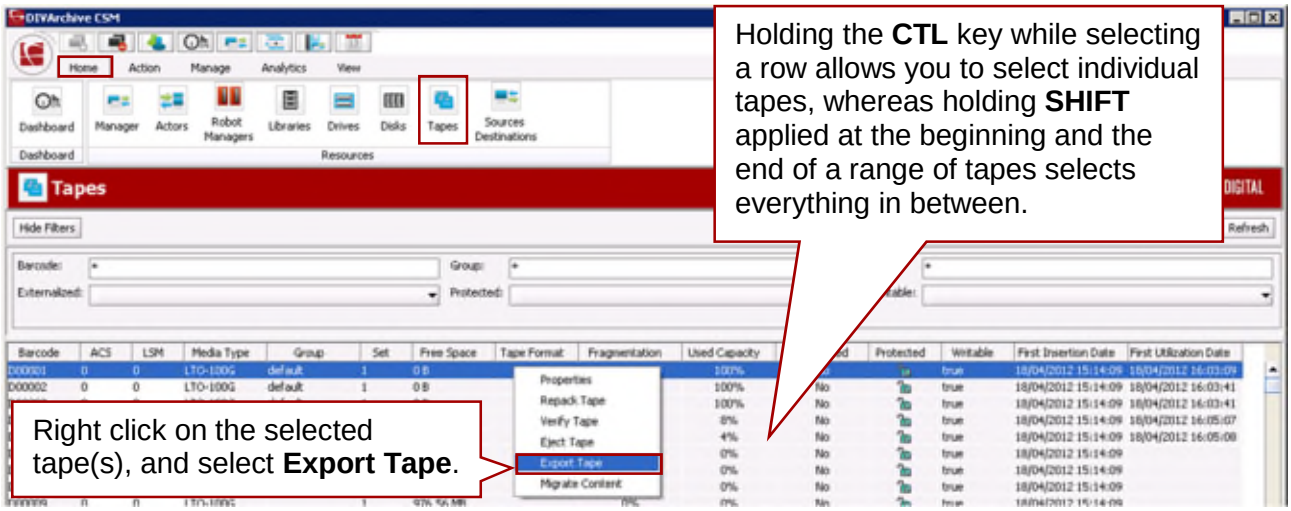


Figure 65: Export Tape Window

2.13.16.1 Exported Tape Metadata Files

When the tapes are exported from your DIVArchive System, each tape's metadata is written to an XML file. If an object is spanned across two (*or more*) tapes, the XML file will encompass every tape in the spanned set. The naming format of each tape metadata XML file is:

`Tapeset-<Barcode>.xml`

Example: `Tapeset-000131.xml`

The root path where the XML files are saved is defined by the **`DIVAMANAGER_EXPORT_ROOT_DIR`** parameter in the DIVArchive Manager Configuration File (*consult your site's DIVArchive Delivery Plan for these details*). By default the export absolute directory root path is:

`%DIVA_HOME%\Program\Manager\bin\exported\`

From this root path, the XML files from each Export Tapes command are saved in sub-folders based on the date and time the command was run.

2.13.16.2 Tape Import Workflow

To use the **`importtapes`** command, first insure that the XML Metadata file and the **`.ffm`** files that were exported exist on the DIVArchive System into which they are to be imported. The files must exist in uncompressed form (*unzipped*) in the DIVArchive Manager's **`bin`** directory (*by default*). In addition, the Object Tape Group must already exist on the target system before the import begins. This Tape Group does not necessarily have to be the same group that the tape was assigned to in the Source System.

There are three main ways that a Tape Object can be treated during the import process:

- Imported as a new object.
- Skipped if the object is already present.
- Imported as an instance of an object already existing in the DIVArchive Database.
    - This option only works if the checksums match.

Refer to the *Oracle DIVArchive Export/Import User Guide* for more information.

2.13.16.3 Importing Tapes

The associated XML files from exported tapes should be copied to the DIVArchive Manager **bin** directory on the platform in which they are to be imported.

Prior to inserting the tapes to the library, the tape metadata must first be imported to the DIVArchive Database. This must be executed for each tape (*or spanned set*) that is to be imported.

To import the metadata, open a command prompt and enter the following:

```
cd \%DIVA_HOME%\Program\Manager\bin
importtapes <destination group> <metadata file>
```

where:

destination group is the tape group that the tape (*or spanned set*) and its instances will be assigned to.

metadata file is the filename of the XML file for the tape (*or spanned set*).

Example:

The tape with barcode number 000131 also contains objects that are spanned across the tape with a barcode of 000120. When tape 000131 is exported, its exported XML file is **Tapeset-000131.xml**, which will also encompass the objects from tape 000120, and both tapes 000131 and 000120 will be ejected from the library. After all objects from both tapes are exported to the XML file, all instances on each tape (*and references to the tapes themselves*) are removed from the DIVArchive Database.

The XML file is then copied to the **%DIVA_HOME%\Program\Manager\bin** folder of the other DIVArchive System on which it is to be imported.

The metadata for this tape is going to be imported into the group MOVIES:

```
importtapes MOVIES Tapeset-000131.xml
```

When the tape's metadata has been successfully imported to the database (*check the Control GUI Current Requests queue*), both tapes and their objects are then considered externalized and can then both be entered into the library with the **Insert Tape** command.

2.13.17 Migrate Content

The **Migrate Content** request allows tape content to be migrated to another Tape Group or Disk Array. An example of where this may be required is if you are upgrading to a new media type in your library, and wish to move the content from the old legacy tapes to the new format.

This request type is only available from the Control GUI **Tapes View** (*refer to Section 6.6.9*). It also uses the DIVArchive Storage Plan Manager (*SPM*) option to perform the migration (*SPM must be installed*). Appropriate **Slots** must also be configured for the migration in the **Slots Tab** of the Configuration Utility. The **Slots** indicate to DIVArchive when the migration operations are to be performed (*refer to the Oracle DIVArchive Storage Plan Manager (SPM) Guide in the DIVArchive Additional Features Documentation library for more information*).

A Migrate request will perform the following:

1. Mount the source tape(s), and issue Copy requests to DIVArchive to copy from the source tape to the destination media (*disk or tape*). Any objects that are spanned will require the object to be copied first into cache.
2. Delete the source instance once the object has been successfully copied to the new media.
3. Ultimately, the source tape(s) will be cleared of all DIVArchive objects and be returned to the **Unused Tapes Sets** pool.

The **Migrate Content** Request is initiated using the **Migrate Content Button** on the Ribbon Bar, or the **Tapes View** in the **Home Tab** by right-clicking the tape to migrate the content from and selecting **Migrate Content** from the resulting menu as shown in the figure below.

Note: DIVArchive now includes an embedded migration service. It is a new and separate internal (*to DIVArchive*) service which helps users to schedule and run jobs to migrate content between different media inside of a DIVArchive system. You can use the Control GUI or command line client. Contact your Oracle Support Specialist for more details.

Figure 66: Action Tab Ribbon Bar – Migrate Content Button

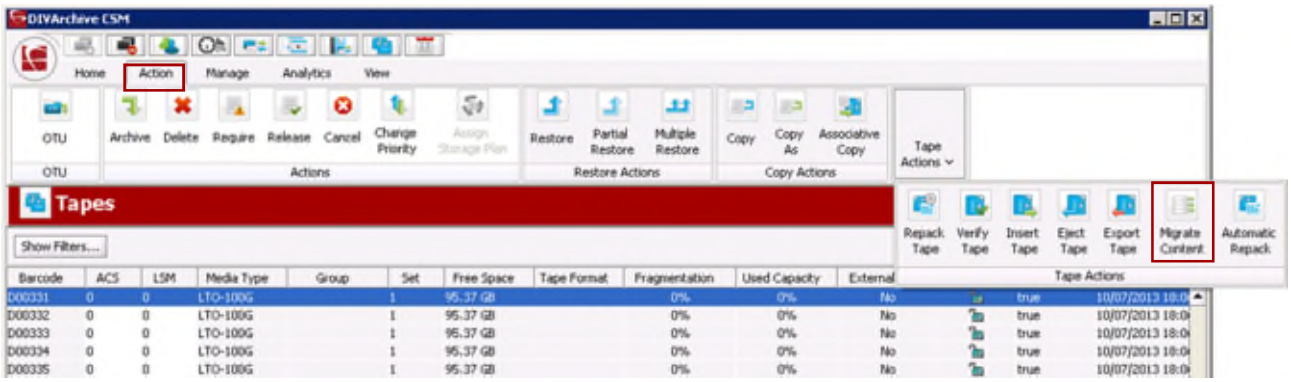


Figure 67: Tapes View Right-Click Menu (Migrate Content Menu)

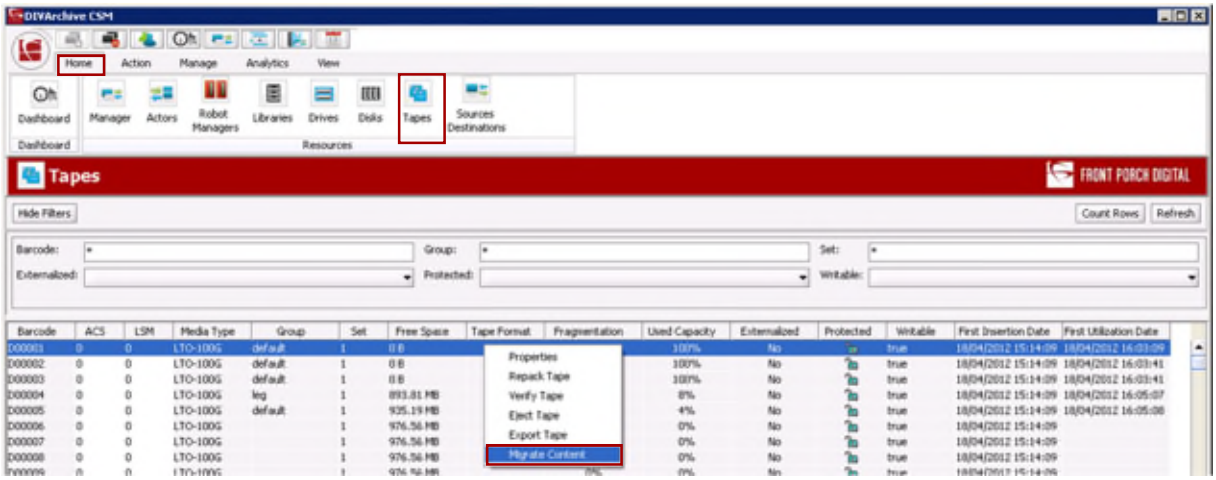
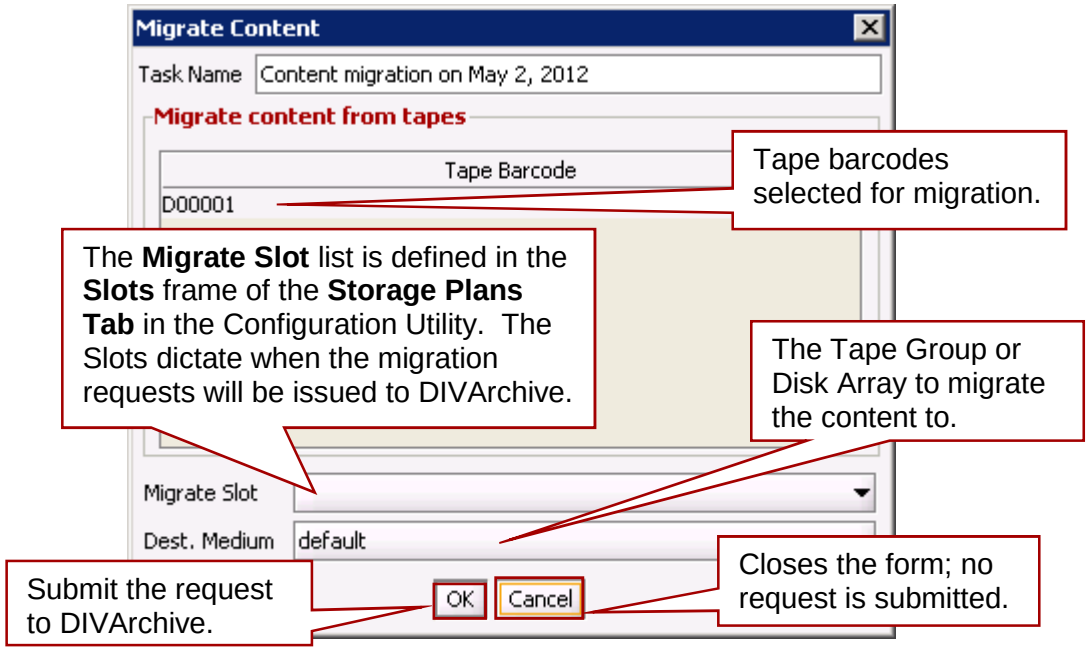


Figure 68: Migrate Content Window



3 DIVArchive Architecture Overview

The DIVArchive System is an integrated archive solution composed of several hardware and software components described in the following sections.

3.1 DIVArchive Hardware Components

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

3.1.1 Storage Devices

- A RAID set is used to store data on hard disk drives.
- A tape library is used to 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 DIVArchive Actors, or via a Fibre Channel interface. In the latter case, they can be attached to a Fibre Channel switch, allowing them to be shared by multiple Actors (*sharing of resources amongst the Actors is controlled and coordinated by the DIVArchive Manager*). The switch provides the connectivity between any Actors and any tape drives that are connected to it.

3.1.2 Management Stations

- At least one management station is required to run the DIVArchive Manager software component, and generally 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.

3.1.3 Actors

- Dedicated Windows servers can be used to host the DIVArchive Actor component.
- The DIVArchive Actor software can also be installed directly on a production server (*Windows based server*) in most cases.

3.1.4 Managers

- The DIVArchive Manager (*Manager*) is the main component in a DIVArchive System and must be installed on Windows platforms.
- As a purchasable option, DIVArchive also supports Main and Backup DIVArchive Managers.
- To use the DIVArchive Backup Service, a Backup Manager must be configured.

3.1.5 Network Devices

- The connection between the DIVArchive System components is achieved through a 10/100BaseT or Gigabit Ethernet hub or switch.

3.1.6 Other components

Other systems or components interacting with the DIVArchive system are:

- 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 can be a Broadcast Automation System, or a Media Asset Management (*MAM*) Application.
- The production servers where objects (*e.g. video files*) are produced (*recorded and digitized*) or from where they are broadcasted (*played back*). 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 DIVArchive Actors that are either attached directly to the high-speed network or via a gateway device provided by the production server manufacturer.

Figure 69: DIVArchive Production Servers and Fiber Channel SAN

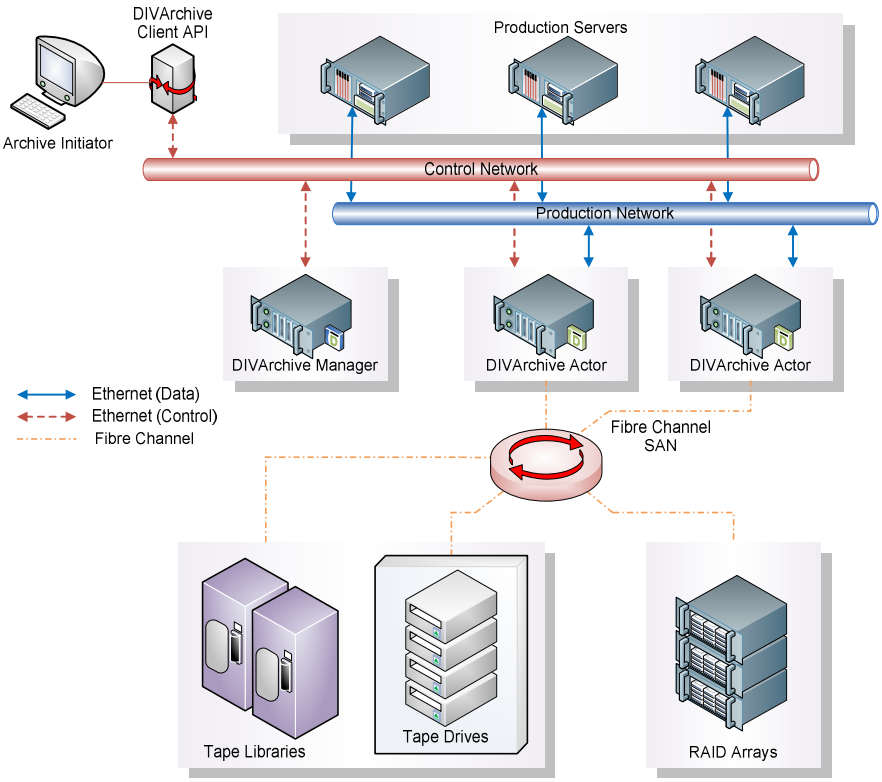
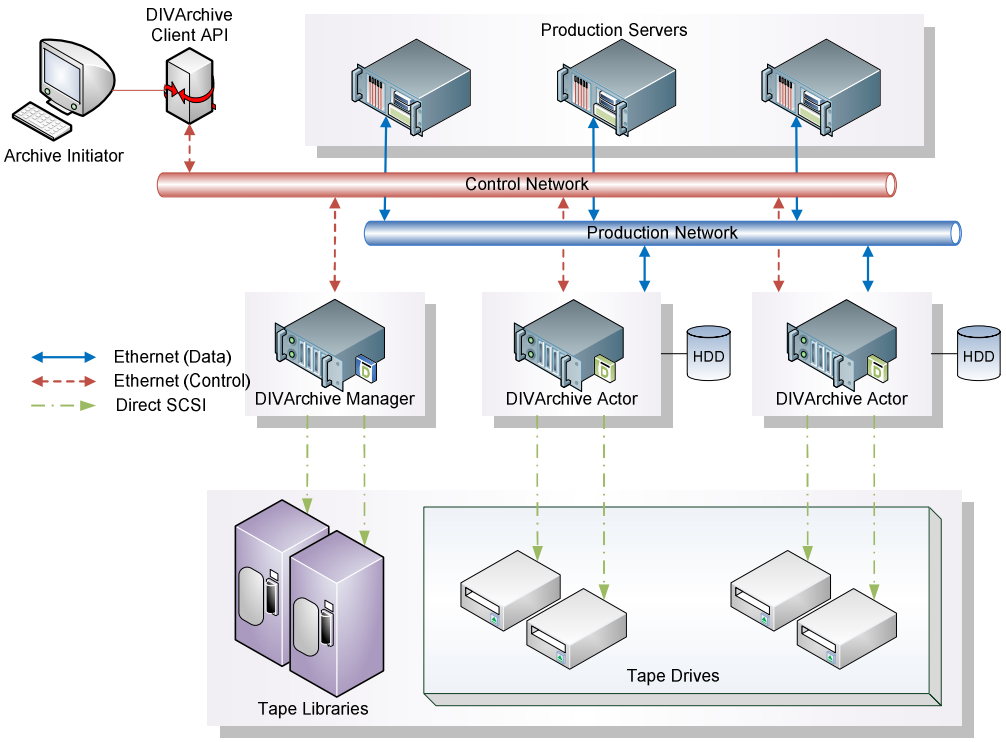


Figure 70: DIVArchive Network Showing Directly Connected Tape Drives/Disk Arrays



3.2 DIVArchive Software Components

DIVArchive software components currently include:

- DIVArchive Actor
- DIVArchive Manager
- DIVArchive Robot Manager
- DIVArchive Configuration Utility
- DIVArchive Control GUI
- DIVArchive Backup Service
- Access Gateway – DIVAnet (*optional*)
  - DIVAnet Migration Gateway (*DMG*)
- Avid Connectivity (*optional*)
  - AM Communicator (*AMC*)
  - TM Communicator (*TMC*)
- Checksum Support and Content Verification
- Client APIs
  - C++, Java, Web Services (*WS, optional*)
  - The DIVArchive API is compatible with DIVArchive versions 6.3 and later.
- Customer Information Collection Tool
- DIVAprotect
- Drop Folder Monitor (*optional*)
- SNMP Agent (*optional*)
- Storage Plan Manager (*SPM*)/Disk Space Monitor (*optional*)
- VACP Converter (*optional*)

Additionally, 3rd party control software may 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 DIVArchive Solution.

3.2.1 DIVArchive Password Security

The DIVArchive Control GUI provides three fixed user profiles (*Administrator, Operator and User*). The Administrator and Operator accounts require a password to obtain access. The DIVArchive System comes installed with default passwords that can be changed any time via the DIVArchive Configuration Utility. If the default passwords are not changed, it leaves the DIVArchive System accessible to possible malicious activity.

Default passwords are required to be changed immediately after installation and configuration for both the Administrator and Operator accounts, and every 180 days (*minimum*) thereafter. Once the change has been made, you must store the passwords in a safe location, offline, where they can be made available for Oracle Support if needed.

3.2.2 Actor

The DIVArchive Actor is the data mover between devices in the production system. It supports the data transfer between many different types of devices and handles Transcode operations with Telestream Transcoding Software (*optional*).

All Actor operations are initiated and coordinated by the DIVArchive Manager. One or more Actors can be configured and controlled by a single DIVArchive Manager.

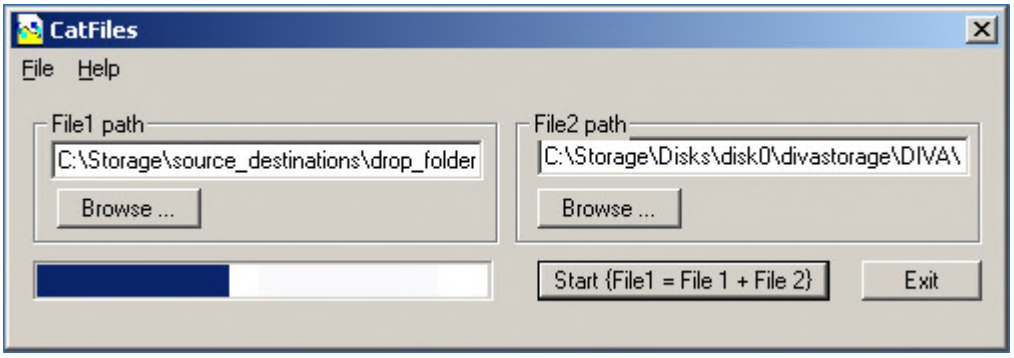
Actor Executable Files

- **`%DIVA_HOME%\Program\Actor\bin\ActorService.exe command [option]`**
  - Refer to Section 3.3.1 for command line parameters.

- **`%DIVA_HOME%\Program\Actor\bin\ActorGUI.exe`**
  - Refer to Section 3.3.1 for information.

- **`%DIVA_HOME%\Program\Actor\bin\CatFiles.exe`**
  - Merges 2 files into a single file.
  - No command line parameters

Figure 71: CatFiles.exe Display Window



- **%DIVA_HOME%\Program\Actor\bin\scandrive.exe**
  - Identifies the Tape Drives in the system.
  - No command line parameters.
- **%DIVA_HOME%\Program\Actor\bin\TapeReadingUtility.exe**
  - Opens the Tape Reading Utility.
  - Utility to read the Tape Drive manually.
  - No command line parameters.
- **%DIVA_HOME%\Program\Actor\bin\VideoAnalyser.exe**
  - Starts the Video Analyzer Utility.
  - This utility GUI displays the internal structure of a video format by dropping video files to the appropriate top tab of the user interface for that file type (*e.g. drop a.mov file on the MOV tab, .avi file on the AVI tab, etc.*). Information will be displayed in the lower window panes.
  - No command line parameters.

3.2.3 Manager

The DIVArchive Manager is the main component in a DIVArchive System. All archive operations are controlled and handled by the DIVArchive Manager. Operation requests are sent by initiator applications through the DIVArchive Client API. As a purchasable option, DIVArchive also supports Main and Backup DIVArchive Managers.

Major Operations

Using the batch files in the Manager's **bin** folder, the user may perform the following major operations.

- Start, Stop, and Restart the Manager Service. All of these operations may be executed via the manager batch file by specifying a **start**, **stop**, or **restart** after the **manager.bat** respectively. An alternative to terminating all running requests via a stop command is to issue a **graceful_shutdown** command that will wait until all running requests have terminated before stopping the Manager.
- Notify the Manager of any changes to the Manager's configuration using the **NotifyManager** batch file.
- Import tapes into a group using the **ImportTapes** batch file.
- List all active connections and kill some connections by connection identifier via the **ConnMgr** batch file.

Manager Executable Files

The **manager.bat** file is a batch file that allows a user to run the Manager as a service or via a console window.

```
%DIVA_HOME%\Program\Manager\bin\manager.bat command [options]
```

*Table 14: **Manager.bat** Command Line Commands*

Command	Description
install (-i)	Installs the Manager as a System Service.
uninstall (-u)	Removes the Manager System Service.
start	Starts the Manager.
stop	Stops the Manager if it is currently running.
graceful_shutdown	Stops the Manager after all requests running at the time of the shutdown have terminated, and ignores any new requests.
restart	Stops and subsequently restarts the Manager.
reload	Requests that the current service reloads its settings.
status	Determines whether or not the service is running.
dump	Requests that the Manager Service create a system dump.
version (-v)	Displays the Manager version information and exits.
help (-h)	Displays help information and exits.

*Table 15: **Manager.bat** Command Line Options*

Option	Description
-conf (-f)	Specifies a particular module configuration file to load the settings from.

3.2.3.1 Checksum Support and Content Verification

The purpose of the Checksum Support and Content Verification program is to introduce additional levels of verification into the DIVArchive System. This feature introduces checksum generation and verification for each file managed by DIVArchive.

Checksum verification occurs when transferring data from a Source/Destination or when reading data from a source or a storage medium. The latter occurs during the retrieval of an object from a storage medium during routine functions (*restore, copy, repack, transcode, but not partial-restore*), or during a read-back from storage (*Verify-Following-Write feature*), or from the source (*Verify-Following-Restore feature*).

Refer to the *Oracle DIVArchive Checksum Support User Guide* in the DIVArchive Additional Features Documentation library for more detailed information.

3.2.3.2 Import Tapes Tool

The **importTapes.bat** file is a batch file used to import one or more tapes into a user-specified group of the DIVArchive system. A user must specify the XML files created during the Export of the tapes as a command-line parameter.

Note: This tool only imports the tape's Metadata into the database and not the objects (*or tape*) themselves into the system. The tape will still need to be inserted using the Insert Tape functions.

Refer to the *Oracle DIVArchive Export - Import User Guide* for more information.

```
%DIVA_HOME%\Program\Manager\bin\importTapes.bat groupname mfiledir [mfiledir…]
```

*Table 16: **importTapes.bat** Command Line Parameters*

Command	Description
help (*-h*)	Displays help information and exits.
groupname	The Tape Group to which imported tapes will belong.
mfiledir	The XML file(s) containing exported tape metadata or a folder that contains the files. The first **mfiledir** is required, additional entries are optional. Multiple files may be used as shown: **mfiledir1 mfiledir2 mfiledir3 mfiledir4**…
-skipIfNameExists (*advanced*)	This is an advanced parameter and skips importing of objects with naming conflicts. Normally if the object name exists the program stops and nothing is imported. This option allows the user to skip the existing object and continue on to import the next object in the XML file. **Warning: This option is not recommended for normal use! Use of this option causes the object on the tape to become "invisible" and DIVArchive will use only the object already existing in the system.**
-useImportDateAsArchiveDate	Forces use of the Import Date instead of the Archive Date as the Archive Date of the object imported into DIVArchive.

3.2.3.3 Connection Manager Tool

The **connmgr.bat** file is a batch file that allows the user to list all the current connections to the Manager. It also allows the user to kill a particular connection using the connection identifier returned with the list of connections.

```
%DIVA_HOME%\Program\Manager\bin\connmgr.bat <manager address> <manager port> command
```

*Table 17: **connmgr.bat** Command Line Parameters*

Command	Description
-l	Lists all the connections to the Manager with Connection IDs.
-d id	Kills the connection specified by **id**.

3.2.3.4 Notify Manager Tool

The Notify Manager application is a tool that allows the user to update a running Manager's configuration. The user must specify the IP and port of the running Manager whose configuration must be updated.

- **%DIVA_HOME%\Program\Manager\bin\NotifyManager.bat**
  - **Usage:**
    - **java com.storagetek.diva.communication.NotifyManager –ip <manager ip> -port <manager port>**

3.2.4 Robot Manager

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

The DIVArchive Robot Manager interfaces to the library by using either a direct interface to the library itself (*via native SCSI or SCSI over Fiber Channel*), or via an intermediate Ethernet connection to the manufacturer's own library control software.

The Robot Manager alerts the DIVArchive Manager when the collection of tapes in the associated library needs synchronization with the DIVArchive database. This functionality is specific to the SCSI Robot Manager module. The purpose is to detect potential tape inventory mismatches between the DIVArchive database and the library inventory.

Potential inventory issues are trapped by the Robot Manager if the library sends unit attention codes **06h 00h 28h** (*inventory may be altered*), or **06h 00h 29h** (*reset occurred*). When this happens, the Robot Manager notifies the DIVArchive Manager so that it resynchronizes the database with the content of the library.

Robot Manager Executable Files

- **%DIVA_HOME%\Program\RobotManager\bin\RobotManager.exe command [options]**
  - Refer to Section 3.3.3 for command line parameters.
- **%DIVA_HOME%\Program\RobotManager\bin\RobotManagerClient.bat rmHost rmPort**
  - This is a command line utility to take control of the Robot Manager in the event that DIVArchive System is down.

*Table 18: **RobotManagerClient.bat** Command Line Parameters*

Parameter	Description
rmHost	Remote host name for connection.
rmPort	Remote host port for connection.

%DIVA_HOME%\Program\RobotManager\bin\RobotManagerGUI.bat

- This is a GUI utility to take control of the Robot Manager in the event that DIVArchive System is down.

3.2.5 Configuration Utility

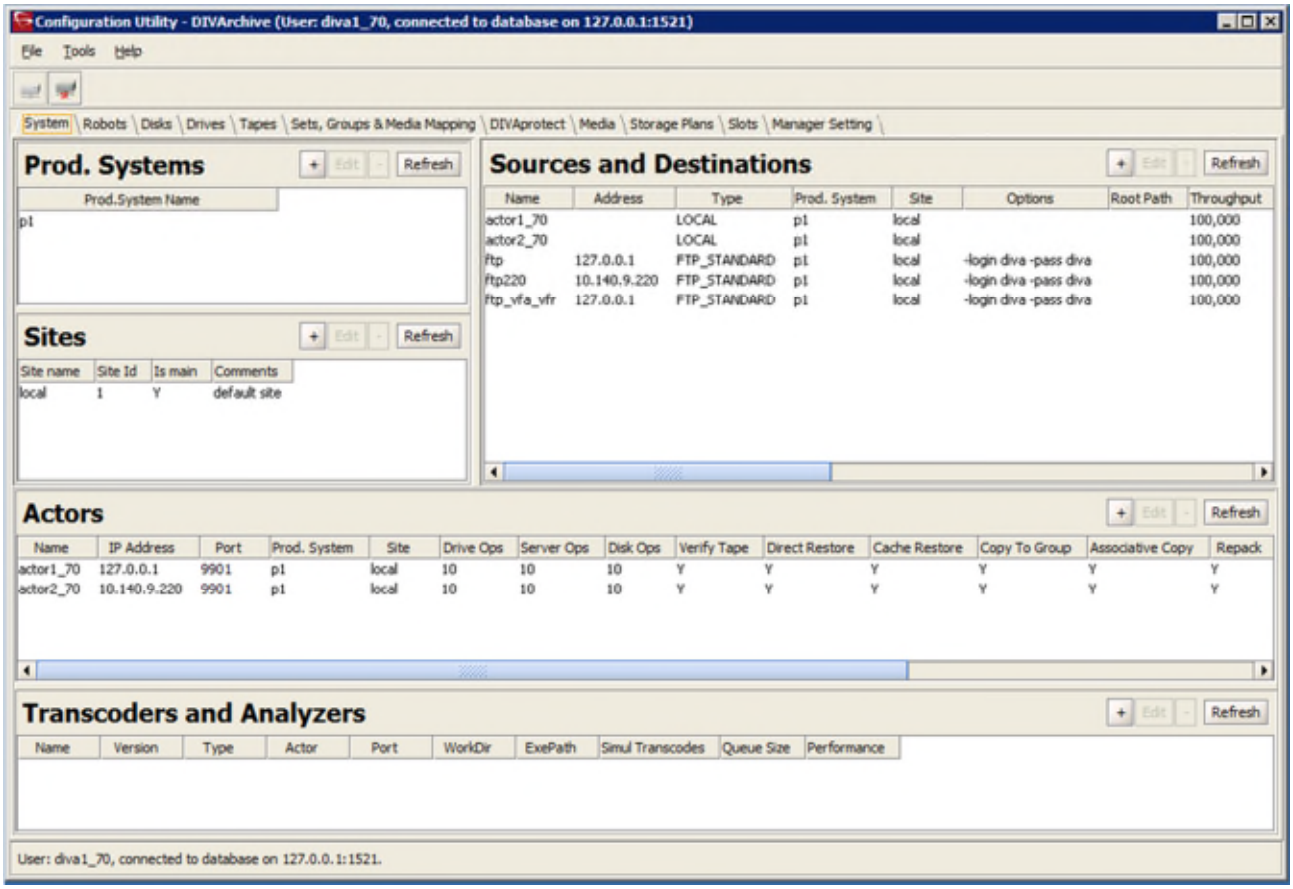
The DIVArchive Configuration Utility is used to configure a DIVArchive System. Although used primarily for configuration of DIVArchive, some operational functions are also performed from the Configuration Utility.

Configuration Utility Executable Files

```
%DIVA_HOME%\Program\Utilities\bin\configutility.bat
```

- Launches the Configuration Utility GUI.
- No command line parameters.

Figure 72: Configuration Utility



3.2.6 Control GUI

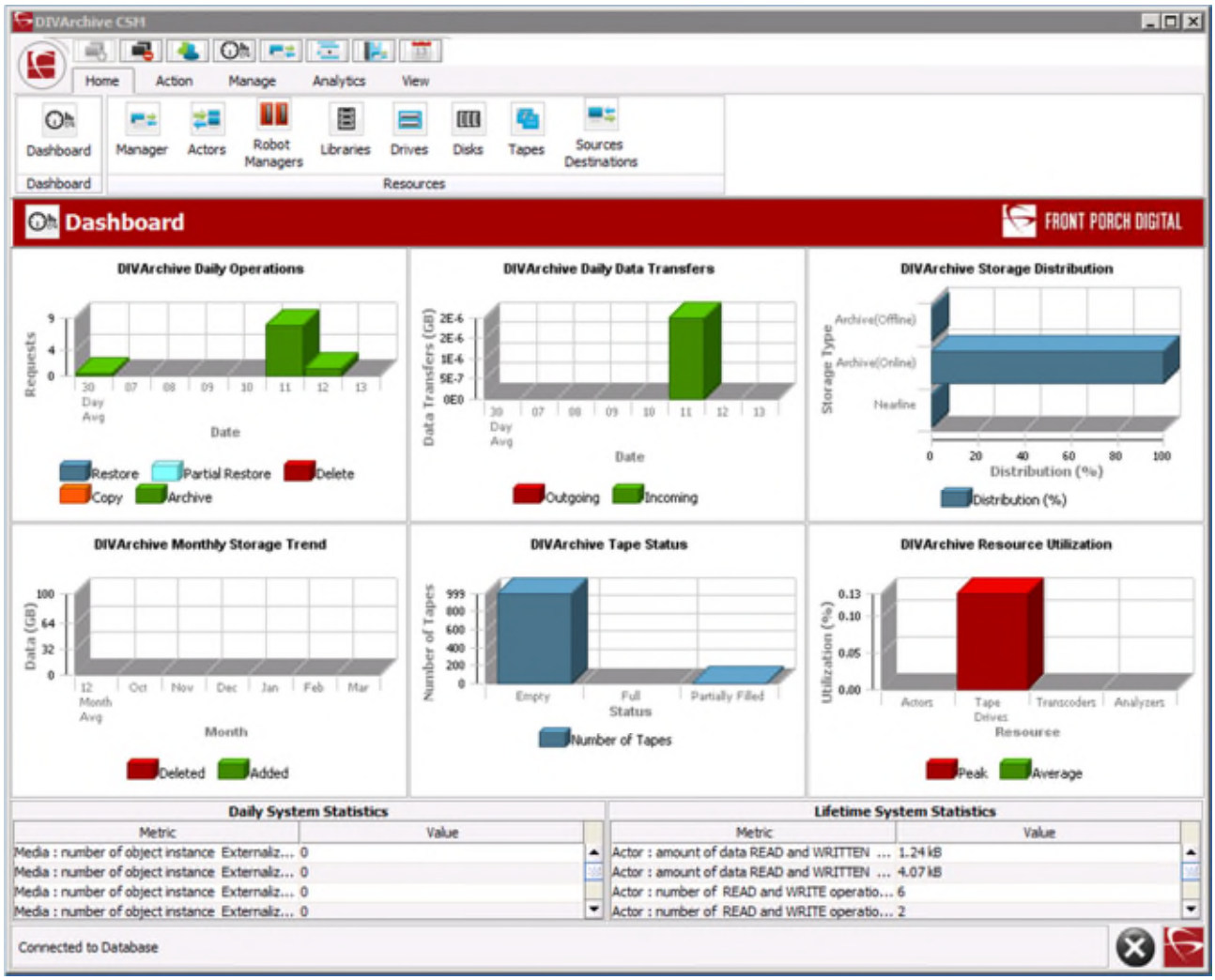
The DIVArchive Control GUI (*Graphical User Interface*) is used to monitor, control, and supervise operations in DIVArchive. Several DIVArchive GUIs can be running and connected to the same DIVArchive System at the same time.

Control GUI Executable Files

```
%DIVA_HOME%\Program\GUI\bin\gui.bat
```

- Launches the Control GUI.
- No command line parameters.

Figure 73: Control GUI Dashboard



3.2.7 DIVArchive Backup Service

To ensure reliability and monitoring of both the Oracle Database and Metadata Database backups, the DIVArchive Backup Service was introduced.

The DIVArchive Backup Service component is installed as an integral part of the standard DIVArchive System installation. The component is typically installed on the same server as the DIVArchive Manager and Oracle Database. The DIVArchive Backup Service allows for configuration of scheduled backups through its configuration file. The DIVArchive Backup Service manages and monitors the entire backup process.

The DIVArchive Backup Service now incorporates the ability to send out emails of issues arising from the process of backing up the Database and Metadata Database files. In order to take advantage of this feature, DIVArchive must be configured to connect to an SMTP mail provider. The email notifications are configured through the **DIVArchive Configuration Utility** under the **Manger Setting Tab**.

Identified issues will be:

- Displayed on all connected GUI Systems.
- Saved to the Events Log.
- Delivered via email.

Contact your Oracle Support Specialist for more information.

3.2.8 Oracle Avid Connectivity

The purpose of the Avid Connectivity with DIVArchive is to transfer archival data to and from DIVArchive in specific video formats and allows for archiving and retrieval of single clips or a sequence of clips. The AMC and TMC related components are installed along with the main DIVArchive installation. Additional installation is required for certain plugins for both AMC and TMC.

Certain DIVArchive API operations used in Avid Connectivity (*such as* ***`GetByFilename`*** *and* ***`DeleteByFilename`***) are not currently supported for Complex Objects.

NOTE: Avid Connectivity is no longer packaged with DIVArchive and is a separate installation process. Contact your Oracle Support Specialist for more detailed information.

3.2.9 Client APIs

The DIVArchive Client API is a set of documented functions allowing external applications, acting as clients, to use the services offered by the DIVArchive System.

A library of client functions is provided and must be linked to each DIVArchive client application. These functions encapsulate client commands into DIVArchive request messages sent over a TCP/IP connection to the DIVArchive Manager.

The **`getFilesAndFolders`** API call is called successively to get the complete file and folder list. Normally the first time the method is called the **`startIndex`** is set to 1 (*one*). For successive calls, set the **`startIndex`** to the **`endIndex`** as returned from the previous call. Once all of the requests have been returned, a call to this method will return an empty list.

New functionality includes:

- Folders will not contain a checksum.
- Several checksums per file are provided if available.
    - MD5, SHA1, etc.
    - Will indicate which checksum is a Genuine Checksum.

Various APIs are available including:

- DIVArchive C++ API.
- DIVArchive Java API.
- DIVArchive WS API (*Web Services*).

The DIVArchive API is compatible with DIVArchive versions 6.3 and later. Please reference the corresponding manuals in the DIVArchive API Documentation library for specifications and details on the use of each API:

- DIVArchive C++ API Reference Manual
- DIVArchive Java API Reference Manual
- DIVArchive WS API Reference Manual
- DIVArchive DIVAprotectWS API User Guide

Along with DIVArchive version 7.3, DIVAS version 2.2 will be released that includes three WS API bundles. DIVAS version 2.2 supports both SOAP and RESTful interfaces and includes:

- DIVArchive WS 6.5 API
- DIVArchive WS 7.0 API
- DIVArchive WS 7.1 API
- DIVArchive WS 7.2 API
- DIVArchive WS 7.3 API
- DIVArchive DIVAprotectWS API

Different bundles may be started and used at the same time. Also, WS API performance has been enhanced through the use of connection pooling.

3.2.10 Customer Information Collection Tool

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

The purpose of the Customer Information Collection Tool is to:

- Receive all customer information required for a support investigation.
  - Log files
  - Dump Files
  - Client Environment
- Receive information from all client sites in a unified (*uniform*) manner.
- Keep detailed client issue information along with the originator's contact information.
- Notify the Oracle Development team as soon as information is transferred to the development facility.
- Permanently store the information collected so that it can be tracked back whenever necessary.

Customer Information Collection Tool Executable Files

```
%DIVA_HOME%\Program\Utilities\bin\CollectSysInfo.bat [parameter value]
```

- Example:

```
%DIVA_HOME%\Program\Utilities\bin\CollectSysInfo.bat –EXMODULES
VACP, AMCommunicator –AFTERDATE 09/25/2009 –MACHINES
172.16.3.45,172.16.3.46 –DBTYPE conf –CUST -CUSTOMER1
```

*Table 19: **`CollectSysInfo.bat`** Parameters*

Parameter	Value
`-EXMODULES [`*`Module names`*`]`	Exclude the specified module from collection logs and configuration files. **`-EXMODULES ALL`** will exclude all of the modules and will collect only the DIVArchive Oracle Database dump. ***The default is collecting all of the modules.***
`-AFTERDATE [`*`MM/DD/YYYY`*`]`	Collects logs only on or after the specified date. ***The default is collecting all of the available logs.***

Parameter	Value
-MACHINES [*IP:hostname,IP:hostname,etc*]	Collects logs from the additional machines mentioned. ***The default is to collect logs only for the current system running the script.***
-DBTYPE [*FULL or CONF*]	Collects a full DIVArchive Oracle Database dump or configuration dump. ***The default is to collect a full DIVArchive Oracle Database dump.***
-CUST [CUSTOMERNAME]	Name of the customer where the logs are collected. The customer name will be truncated if it is longer than 13 characters. ***There is no default value for this optional parameter. If it is not supplied as an argument, the script will prompt the user to enter the Customer Name during execution.***

Apart from the options mentioned above, there are several internal parameters for the script. Each of the internal parameters has a default value that can be overridden by specifying a custom value using the script options.

Example:

```
%DIVA_HOME%\Program\Utilities\bin\CollectSysInfo.bat –EXMODULES VACP,
AMCommunicator –AFTERDATE 09/25/2009 –MACHINES 172.16.3.45,172.16.3.46
–DBTYPE conf –CUST CUSTOMER1 –DIVALOC C:\INSTALL\DIVA
```

*Table 20: List of Hidden Parameters for the **CollectSysInfo.bat** Script*

Internal Parameter Override	Value
-DIVALOC	The DIVArchive installation path for all machines from where the script is collecting logs. ***The default value is %DIVA_HOME%.***
-REMOTEDIVA	The DIVArchive installation location if additional machines are specified using the **–MACHINES** parameter. The path set in this parameter must be shared within the network. ***The default value is \\RemoteSystem\C$\DIVA***
-DUMPPATH	The location where the script will generate the output the **7z** zip file. ***The default value is H:\.***

Internal Parameter Override	Value
-ORACLELOGIN	The DIVArchive Oracle Database username and its connection details. ***The default value is* `diva/lib5@lib5`*.***
-CYGWIN	The Cygwin installation path. ***The default value is* `C:\cygwin\bin`*.***
-SEVENZIP	The **`7z`** zip tool installation path. ***The default value is* `C:\Program Files\7-Zip\7z.exe`*.***
-TEMPDIR	Temporary directory where the script copies the logs and configuration files. This folder is created automatically at the beginning of the script execution and subsequently deleted once the script finishes execution. If the path set in this parameter already exists, the script will fail execution. ***The default value is* `H:/supportinfo`*.***

3.2.11 Drop Folder Monitor (DFM)

The DIVArchive Drop Folder Monitor (*DFM*) provides automatic monitoring of newly created files in up to 20 local folders or FTP folders (*or combinations thereof*). One file or multiple files (*in FTP-folders*) per DIVArchive Object are supported. When a new file (*or FTP folder*) is identified, DFM issues an archive request automatically to DIVArchive to archive the new file or folders. Once these files are successfully archived, they are then automatically deleted from the source.

Drop Folder Manager Executable Files

```
%DIVA_HOME%\Program\InterLink\dfm\bin\dfm.bat command [options]
```

*Table 21: **`dfm.bat`** Command Line Commands*

Command	Description
`install`	Installs the DFM module as a System Service.
`uninstall`	Removes the DFM module System Service.
`start`	Starts the DFM module.
`stop`	Stops the DFM module if it is currently running.
`restart`	Stops and subsequently restarts the DFM module.

Command	Description
status	Requests the status of the DFM.
version	Displays the version information and exits.
help (-h)	Displays help information and exits.

*Table 22: **dfm.bat** Command Line Options*

Option	Description
-conf (-f)	Specifies a particular module configuration file to load the settings from.

3.2.12 SNMP Agent

The DIVArchive Simple Network Management Protocol (*SNMP*) Agent and Management Information Base (*MIB*) support status and activity monitoring of DIVArchive and its subsystems to a 3rd party monitoring application through the SNMP protocol.

The DIVArchive SNMP agent is integrated with the Windows SNMP Service. SNMP information from DIVArchive to a monitoring application is obtained through the DIVArchive SNMP Agent, which in turn establishes a connection to the DIVArchive Manager.

3.2.12.1 Configuring the SNMP Service to Monitor DIVArchive

1. Install the Microsoft SNMP Services on the machine where the DIVArchive Manager is installed.
    a. Add/Remove Programs
    b. Add/Remove Windows Components
    c. Management and Monitoring Tools
    d. Simple Network Management Protocol
2. Stop the SNMP Service and SNMP Trap Service.
3. Navigate to the DIVArchive SNMP installation folder.
    a. **%DIVA_HOME%\Program\SNMP\bin**
4. Make sure this folder contains **DIVAapi.dll**. If it does not, it can be copied from the API Visual Studio .Net Dynamic Release directory.
5. Edit **config.txt.ini** file so that it contains the correct DIVArchive Manager Connection information. Set **POLLING_RATE** to 60 (*to poll for running requests every 60 seconds*). Remove the **.ini** from the end of the file.
6. Open the appropriate registry file (*win2k or nt4, depending upon the Operating System the DIVArchive Manager machine is installed on*) and edit **pathname** so

that it points to the DIVArchive SNMP path you will be using (*e.g.* ***%DIVA_HOME%\Program\SNMP\bin\divasnmpagt.dll***).

7. Double-click on registry file that you just edited to install the SNMP registry keys.
8. Start **`regedit`** (*Start, Run,* ***`regedit`***) and using the registry information in the registry file, navigate to each registry key and make sure the path in the registry is as displayed in the registry file.
9. Open up the properties for the SNMP Service and edit the following:
    a. On the **Traps Tab**, create the **Community Name** *public* and add the IP address of the machine where traps will be viewed (*e.g. the machine where the MIB browser is installed*).
    b. On the **Security Tab**, make sure *send authentication trap is checked* and *Accept SNMP packets from any host* is selected. In the *Accepted community names* text box, add *public* with *READ ONLY* rights and click **Apply**.
10. Start/Restart the SNMP service. **DO NOT START the SNMP Trap Service**.

3.2.13 Storage Plan Manager (SPM)

The DIVArchive Storage Plan Manager (*SPM*) provides automatic migration and life cycling of material within the archive based on the rules and policies defined in the SPM configuration.

The SPM component is also used to trigger deletion of material from SPM managed arrays (*based on disk space watermarks*).

For Major Operations of the DIVArchive SPM refer to Section 3.3.12.

Using FTP is currently not recommended for Complex Objects or Partial File Restore Requests if the Complex Object has more than 3,000 files included.

Even though FTP Servers are now supported as Sources/Destinations, the recommended practice (*for now*) is to use a local Source/Destination, CIFS, or local disk.

Notes:

- **The current (*tested*) workaround for using Complex Objects with FTP servers is to slow down the FTP transfer rate of either the Source/Destination or the FTP Server. However slowing down the transfer rate decreases the performance; it also may be incompatible with many workflows.**
- **For SPM Metadata features, a case-sensitive FTP server is recommended.**
- **SPM will retry failed copy, delete and restore actions after the configured failed action retry interval as set in the SPM configuration file. Refer to the *Oracle DIVArchive Storage Plan Manager (SPM) Guide* in the DIVArchive Additional Features Documentation library for detailed information.**
- **SPM supports disk cleaning based on the object's archived date. Previously, the SPM disk cleaning feature only supported cleaning based on an object's last access time and object size.**

- **Refer to the *Oracle DIVArchive Storage Plan Manager (SPM) Guide* in the DIVArchive Additional Features Documentation library for more information.**

Storage Plan Manager Executable Files

```
%DIVA_HOME%\Program\SPM\bin\SPMService.exe command [options]
```

*Table 23: **SPMService.exe** Command Line Commands*

Command	Description
install (-i)	Installs the SPM module as a System Service.
uninstall (-u)	Removes the SPM module System Service.
debug (-d)	Starts SPM Service in console mode.
version (-v)	Displays the version information and exits.
help (-h)	Displays help information and exits.

*Table 24: **SPMService.exe Command Line Options***

Option	Description
-conf (-f)	Specifies a particular module configuration file to load the settings from.

3.2.14 VACP Converter

VACP (*Video Archive Command Protocol*) is a protocol developed by Harris Automation for interfacing to an Archive System. DIVArchive has its own API for communicating with the DIVArchive 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 DIVArchive API commands.

VACP Executable Files

```
%DIVA_HOME%\Program\VACP\VACPService.exe
```

*Table 25: **VACPService.exe** Command Line Commands*

Command	Description
install (-i)	Installs the VACP module as a System Service.
uninstall (-u)	Removes the VACP module System Service.
debug (-d)	Starts VACP Service in console mode.
version (-v)	Displays the version information and exits.
help (-h)	Displays help information and exits.

*Table 26: **VACPService.exe** Command Line Options*

Option	Description
-conf (-f)	Specifies a particular module configuration file to load the settings from.

3.2.15 Miscellaneous DIVArchive Utilities

DIVArchive has various miscellaneous utilities, some of which are associated with the modules listed previously in this section.

Miscellaneous Utility Executable Files

```
%DIVA_HOME%\Program\Utilities\bin\DIVAConfigurationPrinter.bat
```

- Prints the current DIVArchive configuration.
- No command line options.

```
%DIVA_HOME%\Program\Utilities\bin\DivaScript.exe
```

- Utility allowing using Command Line orders to execute DIVArchive requests and operations.

```
%DIVA_HOME%\Program\Utilities\bin\GetVersion.exe <application path>
```

- Returns the version number for a specific application.

*Table 27: **`GetVersion.exe`** Command Line Parameters*

Parameter	Description
`application path`	Valid path to the application for which the version is being checked.

```
%DIVA_HOME%\Program\Utilities\bin\rdtu.bat
```

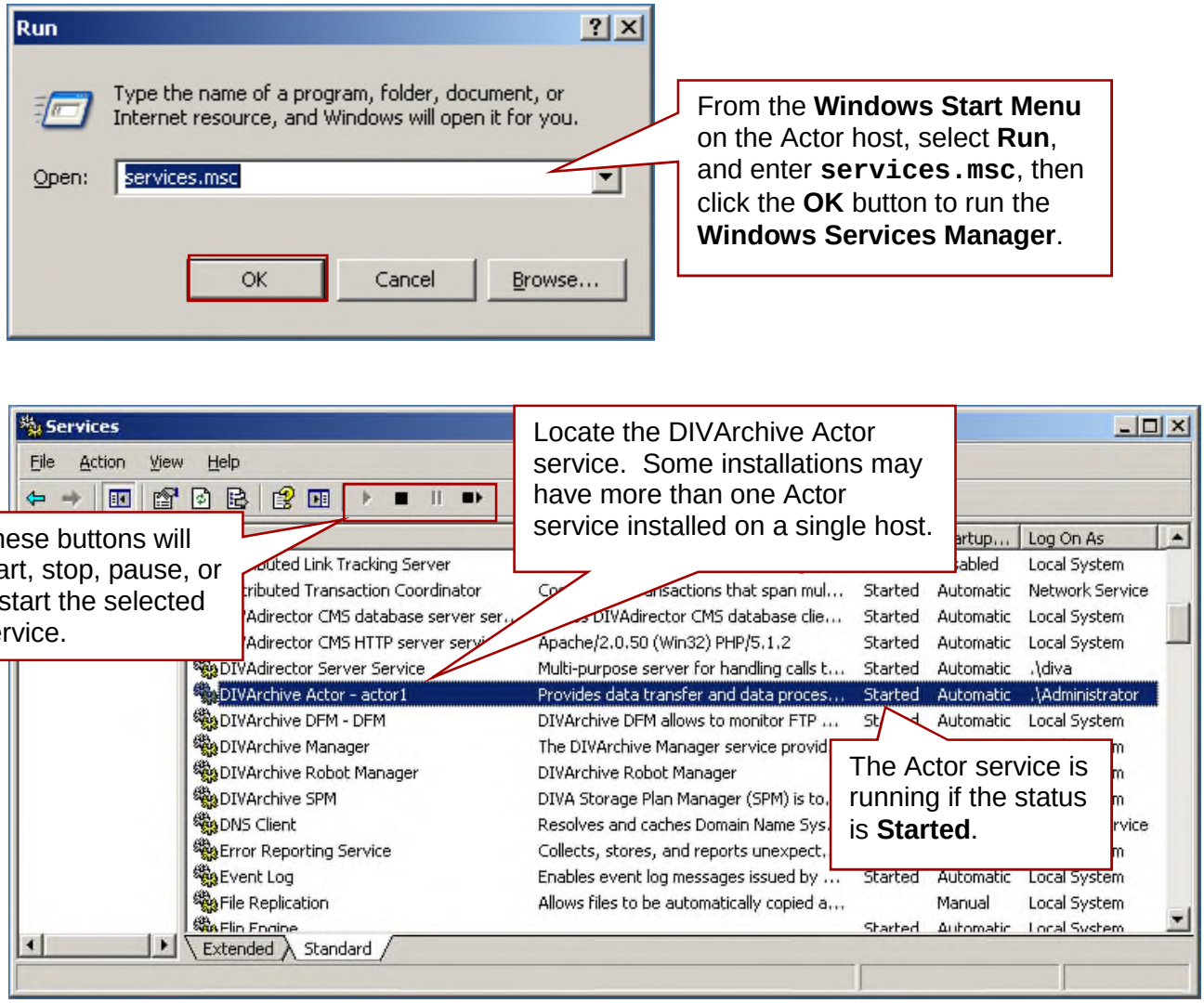
- The Recover Damaged Tape Utility (*RDTU*) is designed to recover object instances that are contained on a damaged tape. The utility is able to recover instances that have valid copies on other available media (*i.e. internal tape or connected disk/array*) within a local or remote DIVArchive System.
- No command line parameters; the settings and configurations are defined in the **`rdtu-conf.xml`** configuration file.

3.3 Managing DIVArchive Software Components

3.3.1 Actor

Each DIVArchive Actor runs as a Windows Service and will automatically start and begin accepting connections from the DIVArchive Manager when the Actor host is booted. Actor service(s) on each host may be managed as shown below.

Figure 74: Starting the DIVArchive Actor Service



The Actor Service may also be started using the Windows Command Line Interface with the following options:

- Main Command:

```
%DIVA_HOME%\Program\Actor\bin\ActorService.exe [command] [options]
```

*Table 28: **ActorService.exe** Command Line Commands*

Command	Description
install (-i)	Installs an Actor as a System Service.
uninstall (-u)	Removes an Actor System Service.
debug (-d)	Starts an Actor in console mode.
***version* (-v)**	Displays the Actor version information and exits.
help (-h)	Displays help information and exits.

*Table 29: **ActorService.exe** Command Line Options*

Option	Description
-conf (-f)	Specifies a particular module configuration file to load the settings from.

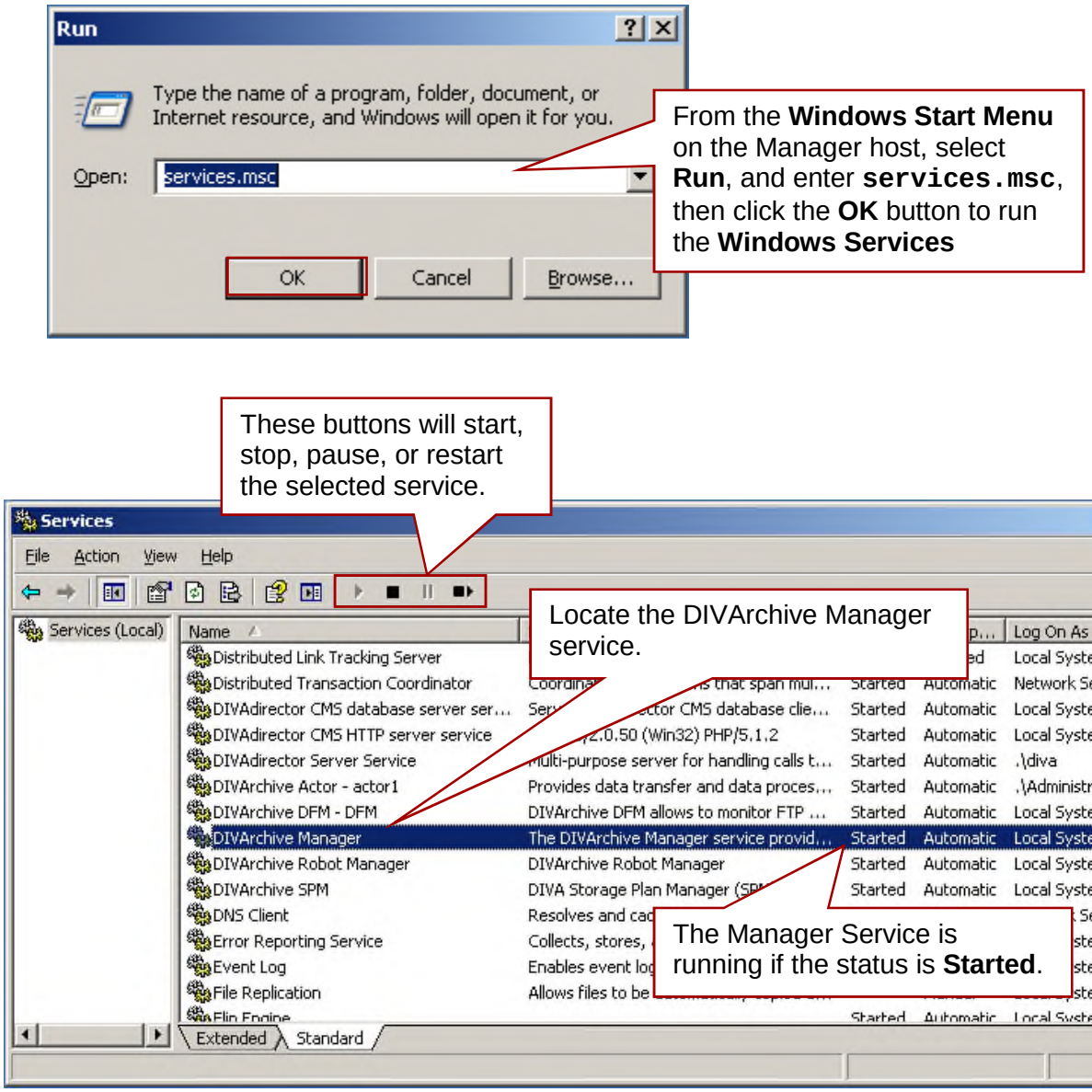
3.3.2 Manager

The DIVArchive Manager (*Manager*) is the main component in a DIVArchive System and must be installed on Windows platforms. All archive operations are controlled and handled by the DIVArchive Manager. Operation requests are sent by initiator applications through the DIVArchive Client API.

The DIVArchive Manager runs as a Windows Service. The static configuration file for the Manager is **`manager.conf`**. Most settings in this file can usually be left set to the default**. Contact your Oracle Support Specialist for more information on Manager Configuration.**

The Manager Service(s) on each host may be managed as shown below.

Figure 75: Starting the DIVArchive Manager Service



The Manager Service may also be managed using the Windows Command Line Interface with the following options:

- Main Command:

```
%DIVA_HOME%\Program\Manager\bin\manager [command] [options]
```

*Table 30: **Manager.bat** Command Line Commands*

Command	Description
install (-i)	Installs the Manager as a System Service.
uninstall (-u)	Removes the Manager System Service.
start	Starts the Manager.
stop	Stops the Manager if it is currently running.
restart	Stops and subsequently restarts the Manager.
reload	Requests that the current service reloads its settings.
status	Determines whether or not the service is running.
dump	Requests that the Manager Service create a system dump.
version (-v)	Displays the Manager version information and exits.
help (-h)	Displays help information and exits.

*Table 31: **Manager.bat** Command Line Options*

Option	Description
-conf (-f)	Specifies a particular module configuration file to load the settings from.

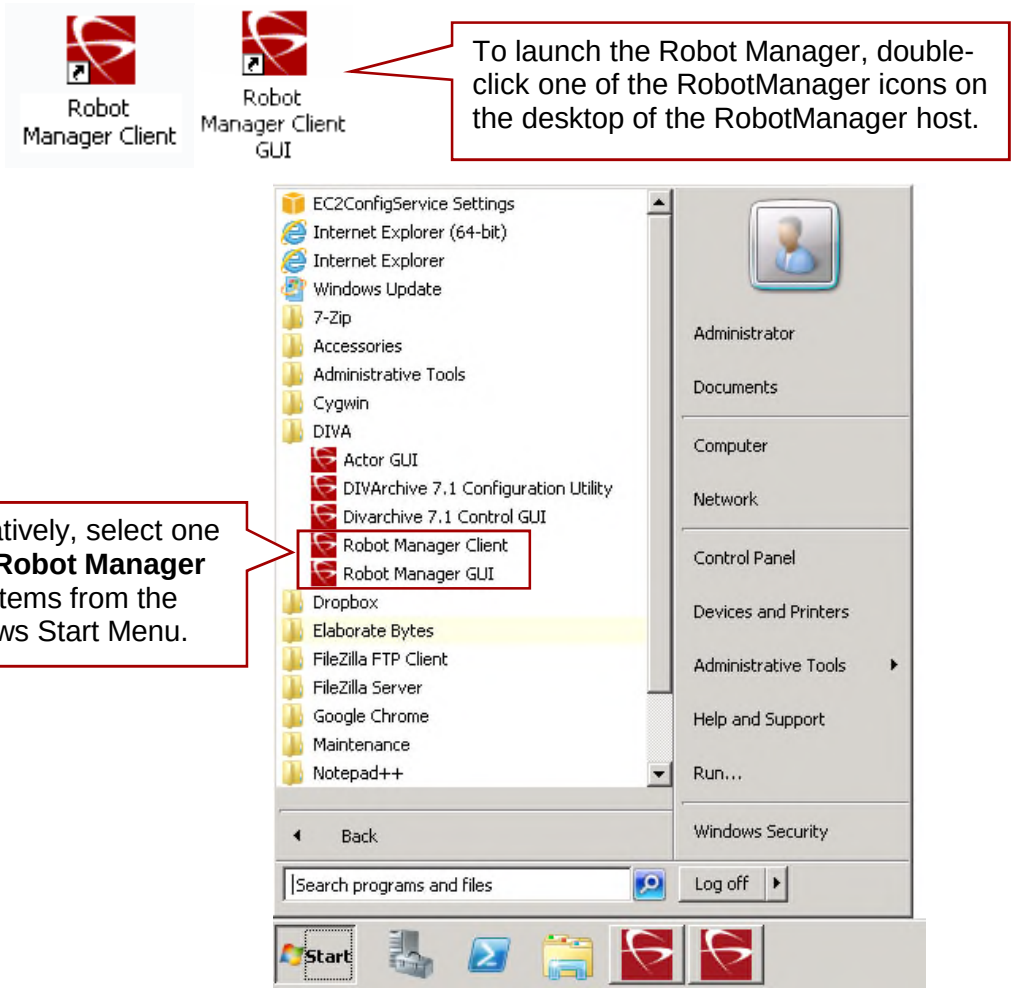
Operations of the Manager Service can be monitored by launching the Control GUI.

3.3.3 Robot Manager Client

The DIVArchive Robot Manager Client can be accessed using either the **Robot Manager Client** (*command line based*) or the **Robot Manager Client GUI** (*graphical interface*).

Note: If intermediate robotics control software is installed between the Robot Manager and the library under control (*such as ACSLS, SDLC, or PSC*), it must be running prior to starting the associated DIVArchive Robot Manager.

Figure 76: Starting the Robot Manager Client



When the Robot Manager Client Command Line Interface is started it will display the window shown in the figure below. The Robot Manager Client will already be started and only the commands necessary to perform the required operations, or to display the required information, need to be entered.

Note: Although a Robot Manager may be restarted while the DIVArchive Manager is running, an attempt to mount a tape to a drive while the Robot Manager is offline may cause the drives to be set *Out of Order*.

```
%DIVA_HOME%\Program\RobotManager\bin\RobotManager.exe command [options]
```

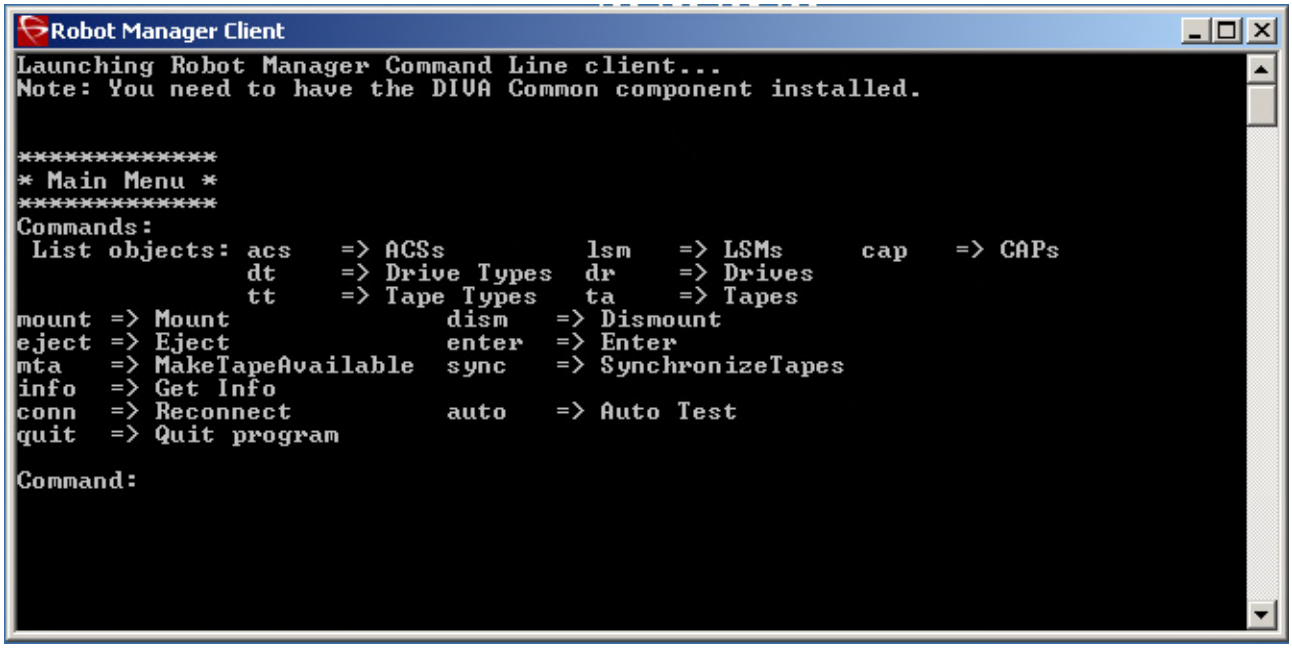
*Table 32: **RobotManager.exe** Command Line Commands*

Command	Description
install (**-i**)	Installs the RobotManager as a System Service.
uninstall (**-u**)	Removes the RobotManager System Service.
debug (**-d**)	Starts the RobotManager in **console** mode.
version (**-v**)	Displays the RobotManager version information and exits.
help (**-h**)	Displays help information and exits.

*Table 33: **RobotManager.exe** Command Line Options*

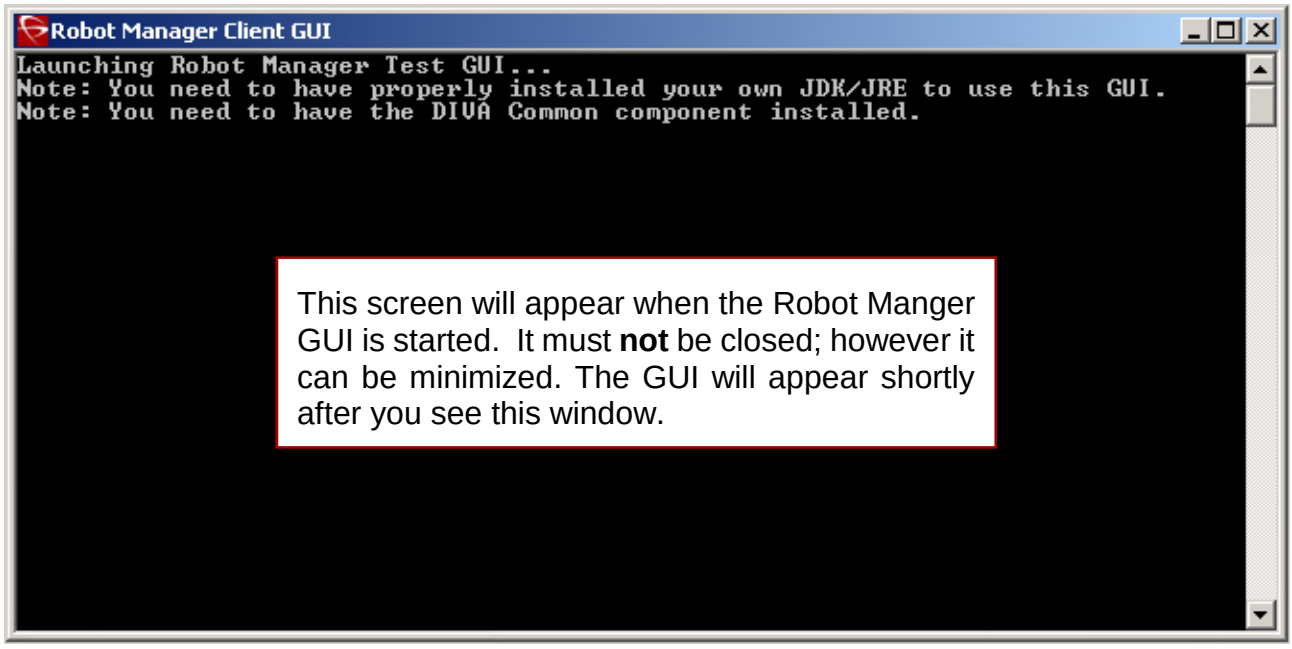
Option	Description
-conf (**-f**)	Specifies a particular module configuration file to load the settings from.

Figure 77: Robot Manager Command Line Interface Screen



The Robot Manager Client GUI is a graphical interface making it easy for the user to interact with the Robot Manager.

Figure 78: Robot Manager Client GUI Screen



3.3.4 Configuration Utility

The DIVArchive Configuration Utility is a software utility used to configure the DIVArchive System. It can be run on any machine that has TCP/IP connectivity to the host running the DIVArchive Database.

The DIVArchive Configuration Utility connects primarily to the DIVArchive Database, and for some tasks, directly to the DIVArchive Robot Manager(s), if installed. After launching the utility you must first connect to the database to edit the DIVArchive System Configuration. The Oracle username and password for DIVArchive should be documented in the DIVArchive Delivery Plan for your site.

Since it is a Java based utility, Java Runtime Environment 64-bit (*build 1.8.0_45-b14*) must also be installed on the host. For the Configuration Utility to launch, the **%DIVA_HOME%** environmental variable in the host Operating System must also be defined. This variable should match the absolute directory path to the JRE **bin** folder; for example **%DIVA_HOME%\Java** (*where **%DIVA_HOME%** is the chosen DIVArchive installation directory*).

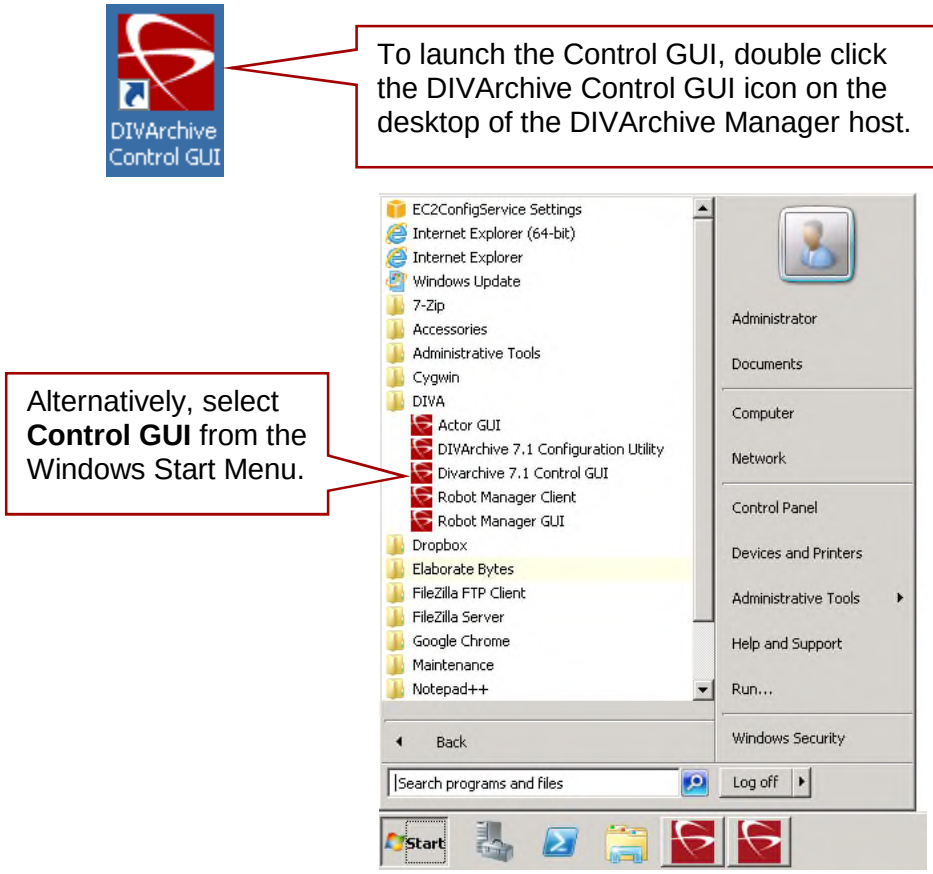
Contact your Oracle Support Specialist for detailed information.

Warning: The Configuration Utility is intended only for experienced users. Incorrect or incomplete changes in the Configuration Utility can adversely affect DIVArchive operations (*and possibly even delete data from the archive*), or prevent the DIVArchive Manager from running. If you are unsure about changes you wish to make, please contact Oracle Technical Support for assistance before attempting to make alterations to the system configuration.

3.3.5 Control GUI

Perform the following procedure on the DIVArchive Manager host to launch the DIVArchive Control GUI.

Figure 79: Starting the DIVArchive Control GUI



3.3.6 DIVArchive Backup Service

When using Complex Objects, it is STRICTLY REQUIRED to use the Backup Service. The DIVArchive Backup Service is the only component backing up the Metadata Database and removing outdated Metadata files. When a Delete Request for a Complex Object is sent and processed, the data is removed from the Oracle Database, but the Metadata Database File is not deleted and is removed by the Backup Service after the configured clean up period (*define by the Recovery Period parameter*) has been reached. **Note: Do not change the Metadata Location parameter when the system is running.**

In the event of a database/system failure where restoring from a system backup is necessary, restoration of a stored backup is accomplished manually through existing Oracle scripts and should be performed by Oracle Support personnel only.

The DIVArchive Backup Service generates full database backups and incremental database backups. Oracle Database Backups and Metadata Database Backups will be incrementally replicated to all remote backup systems by the DIVArchive Backup Service.

The DIVArchive Backup Service periodically sends status messages to the DIVArchive Manager. The DIVArchive Manager saves all error messages received in the Manager Events Log, and also forwards messages to all connected Control GUI applications to be displayed in a pop-up window. If no Control GUIs are connected at the time of the error, no error pop-ups will be displayed. However, errors can be reviewed later in the Events Log.

Users should have an elevated awareness of error messages from the Backup Service.

Contact your Oracle Support Specialist for more information.

3.3.7 Avid Connectivity

The purpose of the Avid Connectivity with DIVArchive is to transfer Avid content (*single clips or sequences of clips*) to and from DIVArchive.

All operations for the AM Communicator are performed from Avid Interplay, not DIVArchive.

All TM Communicator archive operations are performed from Avid while all restore and delete operations are performed from DIVArchive.

Certain DIVArchive API operations used in Avid Connectivity (*such as* ***`GetByFilename`*** *and* ***`DeleteByFilename`***) are not currently supported for Complex Objects.

Contact your Oracle Support Specialist for more information.

3.3.8 Checksum Support and Content Verification

During the archive process the checksum is generated “on the fly” by the Actor and stored in the database. This checksum is not verified until an initial read-back or restore operation is performed.

Viewing the Checksum verifications and failures is accomplished through the Control GUI System Manager View, Actor View, or via other request control views.

Double-clicking on the resource will bring up a popup window showing verification or failure messages along with the checksum information. Hover over the Checksum notation to bring up a smaller popup showing the Source, Component, Checksum Type, and Checksum Value.

Note: New features (*and metrics*) have been introduced into the Checksum verification process. Refer to the *Oracle DIVArchive Checksum Support User Guide* in the DIVArchive Additional Features Documentation library for more information.

3.3.9 Customer Information Collection Tool

The Customer Information Collection Tool is used by the Oracle Customer Engineers to collect data for submission to the Oracle Development and Engineering Team.

*This tool is meant to be used **only** with assistance from an Oracle Customer Support Engineer.*

3.3.10 Drop Folder Monitor

The following are general instructions for operating and administering the DFM. The DFM Service can be started, stopped, and restarted using the Operating System Services facilities or the DFM command line utility on each host that is running a DFM installation.

Refer to the *Oracle DIVArchive DFM User Guide* in the DIVArchive Additional Features Documentation library for more information.

3.3.10.1 Starting and Restarting DFM

When the DFM Service starts, or restarts, DFM loads and validates the configuration file. If any configuration issues are detected, the process terminates and runs diagnostics.

If the configuration validation has performed successfully, DFM begins scanning all of the configured Drop Folders, checks the status of all objects that were initialized before DFM was last shutdown, and updates the internal database with the current status of the objects.

Once all of these have completed, the DFM status will be **Running**.

3.3.10.2 Running DFM

When DFM finds files in a configured Drop Folder it updates the internal database and requests DIVArchive to archive all files found as new objects. In order to avoid repeated archive requests, DFM continuously updates the archive operations status in the internal database.

DFM logs information about the incomplete files and calls the DFM File Manager Module to move them to the Trash Folder.

If DIVArchive requests fail, the DIVArchive Status Module informs the internal database about the failure. If the number of unsuccessful request attempts reaches a pre-configured number, the object status is changed to **could not be archived** and the object is marked as incomplete.

If the request completes successfully, the internal database is updated by the DIVArchive Status Module. In the case of a File Set Object, DFM removes the Metadata File and the File Set folder.

3.3.10.3 Stopping DFM

DFM will shut down upon execution of the shutdown script, stopping all internal processes before all archive operations are completed.

After all of the modules are stopped, all internal statuses are saved on the disk in the internal database before the DFM completes shutdown.

3.3.10.4 Summary of DFM Administration

The Configuration file for DFM is:

`%DIVA_HOME%\Program\conf\dfm\dfm.conf.`

Service Logging is achieved through:

- The log folder is **`DIVA\Program\log\dfm\`**.
- The logging configuration is in **`DIVA\Program\conf\dfm\dfm.trace`**.

DFM can be managed using:

```
%DIVA_HOME%\Program\InterLink\dfm\bin\dfm.bat command [options]
```

Table 34: DFM Command Line Commands

Command	Description
`install`	Installs the DFM as a System Service.
`uninstall`	Removes the DFM System Service.
`start`	Starts the DFM Service.
`stop`	Stops the DFM Service

Command	Description
`restart`	Stops and then restarts the DFM.
`status`	Displays the status of the DFM.
`version`	Displays the version information and then exits.
`help`	Displays help information and then exits.

Table 35: DFM Command Line Options

Option	Description
`-conf (-f)`	Specifies a particular module configuration file to load the settings from.

3.3.11 SNMP Agent

The SNMP (*Simple Network Management Protocol*) Agent is integrated with the Windows SNMP Service and should automatically start when the host is booted.

SNMP information from DIVArchive to a SNMP monitoring application is obtained through the SNMP Agent. The SNMP Agent establishes a connection to the DIVArchive Manager and the Windows SNMP Service starts automatically when the host is booted. The SNMP Agent should connect to the Manager automatically when the Manager is launched. If the connection is not successful, the SNMP Service can be managed as follows:

Figure 80: Starting the Windows Services Control Panel

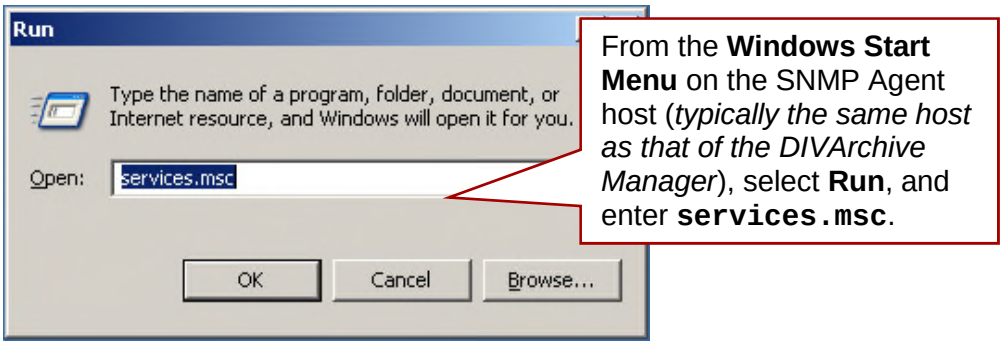
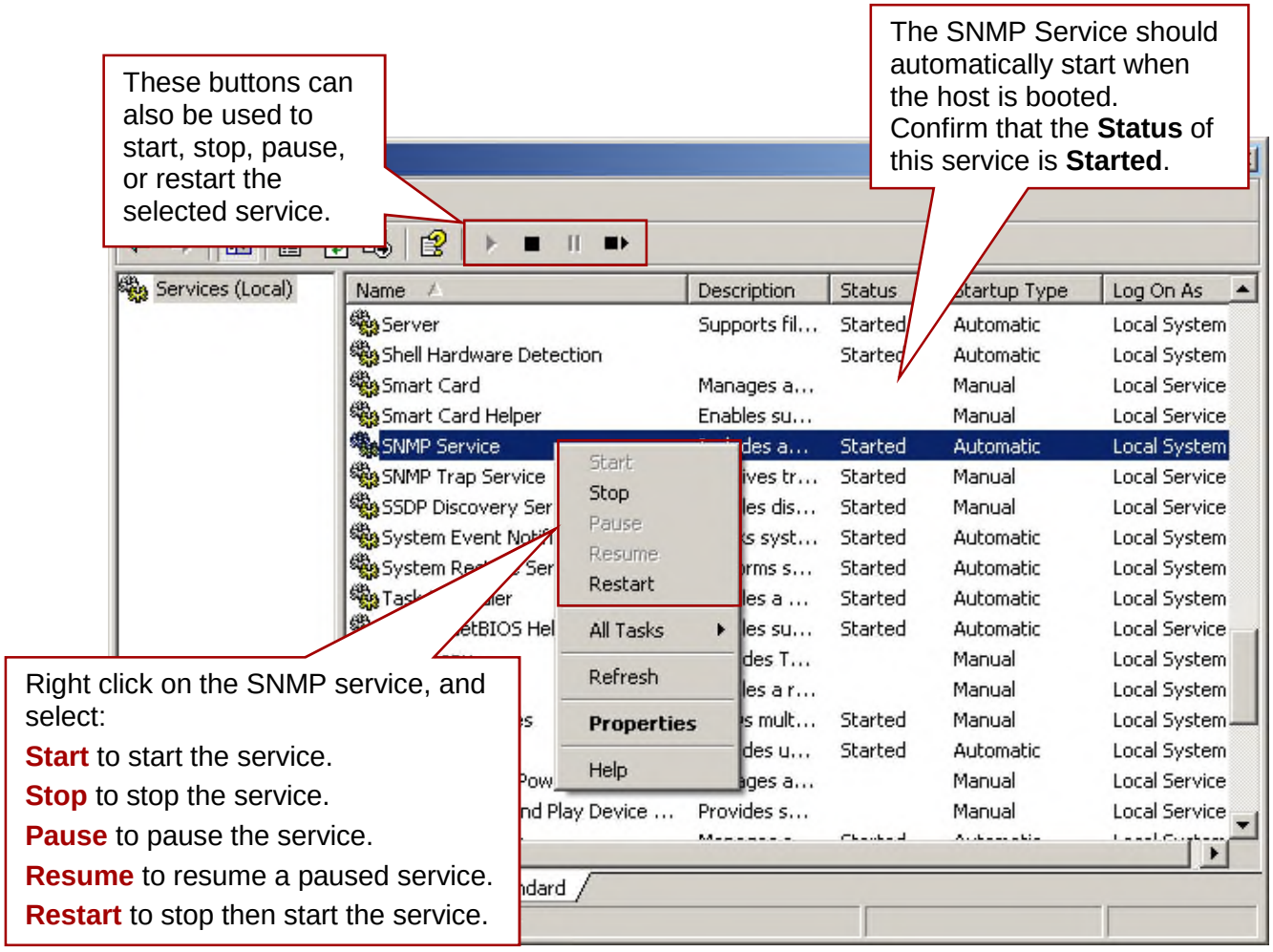


Figure 81: Starting the SNMP Service



The SNMP Service can also be manipulated through the Windows command prompt. From the **Windows Start Menu** on the SNMP Agent host (*typically the same host as that of the DIVArchive Manager*), select **Run**, and enter **`cmd`**. This opens a Windows Command Line Window. Once the Command Line Window opens, use one of the following commands to control the service:

```
net start "SNMP Service"
```

- Starts the SNMP Service.

```
net stop "SNMP Service"
```

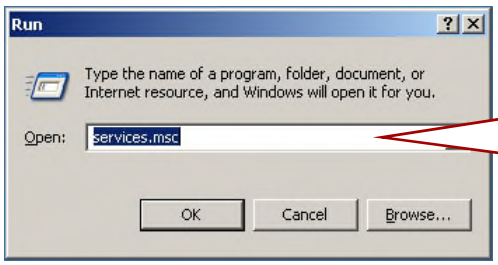
- Stops the SNMP Service.

Note: The quotation marks in the above commands are <u>required</u> when dealing with services that have spaces in their service name.

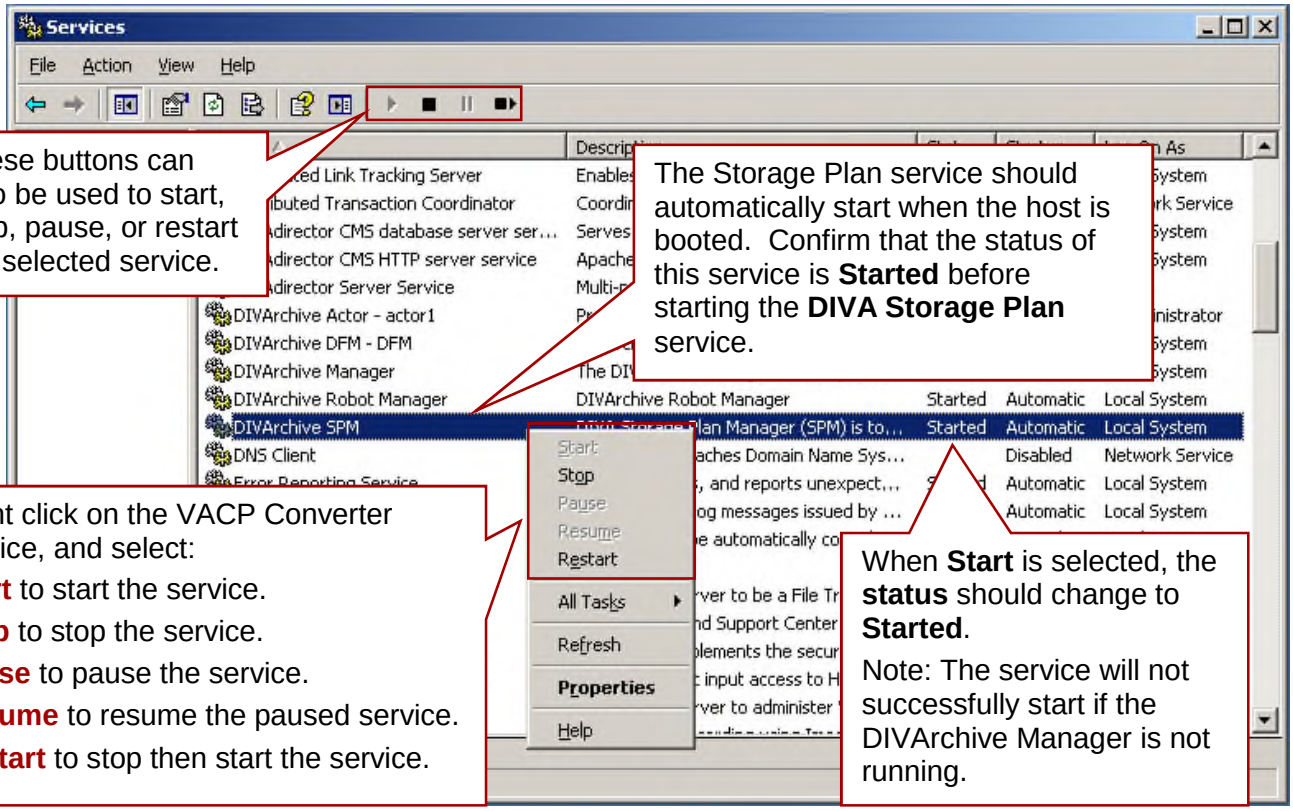
3.3.12 Storage Plan Manager

The Storage Plan Manager (*SPM*) runs as a Windows Service. For the service to start requires a successful connection to the DIVArchive Manager. Therefore it should be started manually **after** the DIVArchive Manager is running.

Figure 82: Starting the Storage Plan Manager and Naming Service



From the Windows **Start Menu** on the SPM host (*typically the same host as that of the DIVArchive Manager*), select **Run**, and enter **`services.msc`**.



These buttons can also be used to start, stop, pause, or restart the selected service.

The Storage Plan service should automatically start when the host is booted. Confirm that the status of this service is **Started** before starting the **DIVA Storage Plan** service.

Right click on the VACP Converter service, and select:

Start to start the service.

Stop to stop the service.

Pause to pause the service.

Resume to resume the paused service.

Restart to stop then start the service.

When **Start** is selected, the **status** should change to **Started**.

Note: The service will not successfully start if the DIVArchive Manager is not running.

The Storage Plan Service can also be manipulated through a command prompt using the following commands:

```
net start "DIVArchive SPM"
```

- Starts the DIVArchive SPM Service.

```
net stop "DIVArchive SPM"
```

- Stops the DIVArchive SPM Service.

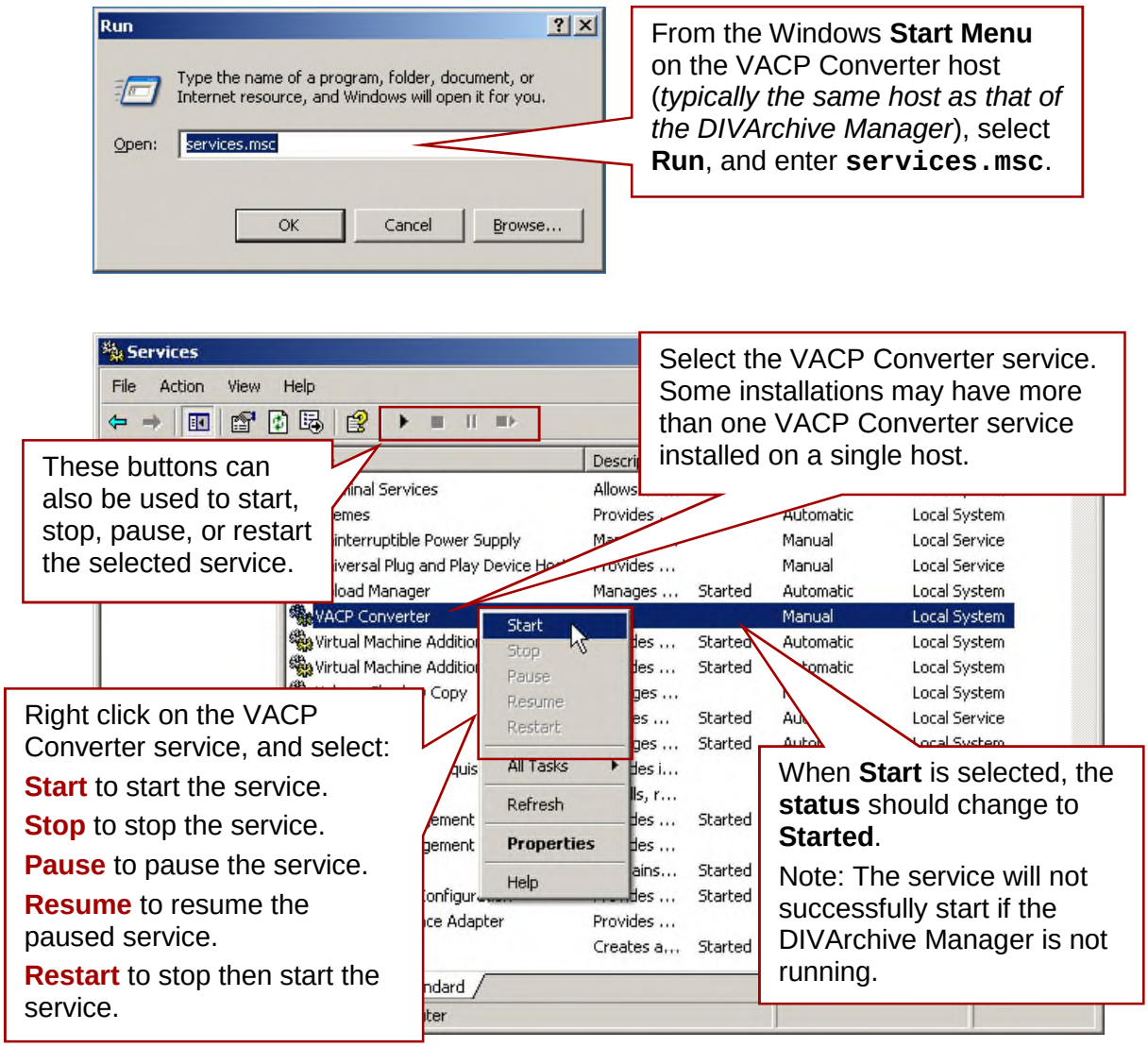
Refer to the *Oracle DIVArchive Storage Plan Manager (SPM) Guide* in the DIVArchive Additional Features Documentation library for more information.

Note: The quotation marks in the above commands are <u>required</u> when dealing with services that have spaces in their service name.

3.3.13 VACP Converter

The VACP Converter is installed as a Windows Service. For the service to start requires a successful connection to the Manager. Therefore it must be started manually **after** the Manager is running.

Figure 83: Starting the VACP Converter Service



The VACP Converter service can also be manipulated using the command prompt. The precise name of the service may vary at each site if there is more than one VACP Converter service installed (*refer to the Site Delivery Plan for details*).

```
net start “VACP Converter”
```

- Starts the VACP Converter Service.

```
net stop “VACP Converter”
```

- Stops the VACP Converter Service.

Note: The quotation marks in the above commands are <u>required</u> when dealing with services that have spaces in their service name.

4 Starting and Stopping DIVArchive

The following sections describe the steps needed to start and stop the DIVArchive System.

4.1 Starting DIVArchive

4.1.1 Hardware Startup

To start all of the DIVArchive hardware components perform the following steps in sequence.

Note: Wait for initialization of each hardware component to complete before moving to the following step.

1. Check that all required devices are installed. If they are not installed, install them before proceeding any further.
    a. Library and drives
    b. SAN RAID Arrays
    c. Fiber Channel Switches
    d. Networking Devices
    e. Terminal Concentrator
    f. Graphical Front End Hosts
    g. Library Manager Host
    h. Actor Hosts
2. Power on the Library and Drives.
3. Power on the SAN RAID Arrays.
4. Power on the Fiber Channel Switches.
5. Power on Networking Devices.
6. Power on Terminal Concentrator.
7. Power on the Graphical Front End Hosts.
8. Power on the Library Manager Host.
9. Power on External Direct Attached Devices
10. Power On Manager Hosts
    a. **IMPORTANT**: In installations where two Manager Hosts are installed, it may be required to always start the Main Manager first; then start the Alternate Manager at a later time. Please consult your installation specialist to determine if this is applicable to your installation.
11. Power on the Actor Hosts.
12. If everything powered on successfully, hardware startup is now complete.

4.1.2 Software Startup

The following steps indicate the order in which the software components of a DIVArchive System are required to be launched. Some software components may be set to launch automatically when the host is booted (*such as the Actor Service*).

The management of each DIVArchive software component, whether manually or automatically initiated, is covered in Managing DIVArchive Software Components.

1. Check that all of the required components are installed. If they are not installed, install them before proceeding any further.
    a. Library Manager
    b. Library
    c. DIVArchive Manager
    d. DIVArchive Backup Service
    e. Complex Objects (*if being used*)
    f. DIVArchive Access Gateway
    g. DIVArchive VACP Converter
    h. DIVArchive Storage Plan Manager (*SPM*)
    i. DIVArchive Drop Folder Manager (*DFM*)
2. Launch the Library Control Software.
    a. ACSLS
    b. PCS
    c. SDLC
3. Launch the DIVArchive Robot Manager(s).
4. Launch the DIVArchive Actors(s).
5. Launch the DIVArchive Manager.
6. Launch the DIVArchive Access Gateway.
7. Launch the DIVArchive VACP Converter.
8. Launch the DIVArchive Naming Service.
9. Launch the DIVArchive Storage Plan Manager (*SPM*).
10. Launch the DIVArchive Drop Folder Manger (*DFM*).
11. If everything started successfully, software startup is now complete.

4.2 Stopping DIVArchive

4.2.1 Software Shutdown

To ensure that requests currently still in progress are not prematurely aborted by shutting down the DIVArchive System, it is recommended the DIVArchive Manager be stopped first, since any request(s) currently active will be completed before the Manager will complete the shutdown.

Shutdown of the DIVArchive Manager is detailed in 3.3.2. When the DIVArchive Manager is shutdown, all archive operations are ceased. Therefore it is not necessary to stop other DIVArchive software components prior to shutting down the host computer on which they are installed. For reference purposes however, manual shutdown of each DIVArchive component is detailed in Managing DIVArchive Software Components.

4.2.2 Hardware Shutdown

To shut down all DIVArchive related equipment or devices, follow these steps in sequence:

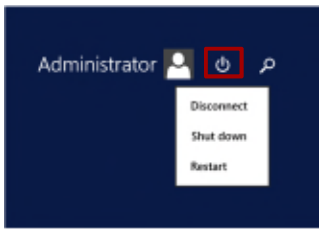
1. Shutdown Actor Hosts.
2. Shutdown Manager Host.
3. Power off external direct attached devices (*disks, etc.*).
4. Power off Graphical Front End Hosts (*if installed*).
5. Power off Terminal Concentrator (*if installed*).
6. Shutdown Library Manager Host (*if installed*).
7. Power off Networking Devices.
8. Power off Fiber Channel Switches (*if installed*).
9. Power off SAN RAID Arrays (*if installed*).
10. Power off Library and Drives (*if installed*).
11. If everything shutdown successfully, hardware shutdown is now complete.

4.2.3 Shutting Down Windows

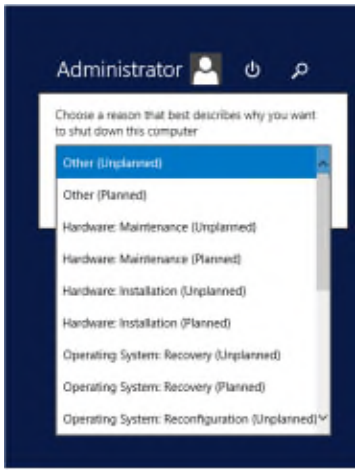
Use the following procedure to shut down Windows 2012 Server:

1. Click on the windows icon on the lower left side of the screen. This will take you to the *Live Tiles* screen.

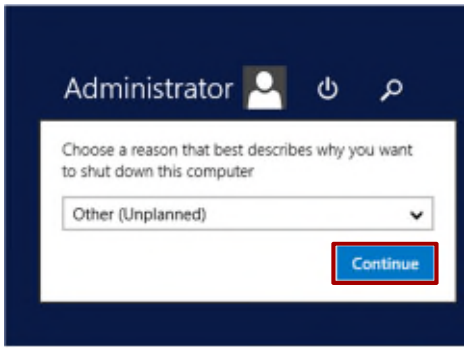
2. On the top right side of the screen click on the Power Button icon.



3. Click on **Shutdown** in the resulting menu.



4. Select the reason for shutting down the server from the list and click Continue.



5. The server will now shut down gracefully.

Note: If a Windows based host appears to stop responding for a lengthy period on system shutdown, you can also force it to power off by holding the power button continuously for 4 seconds.

4.3 Manager Failover Procedures

In the event of a Manager failure, use the procedures below to switch to a Backup Manager if possible.

Warning: These procedures are critical and sensitive. They should only be performed under the control of an Oracle Support Technician.

Perform these steps on the Main Manager machine:

1. If the DIVArchive Manager Service is still running, try to stop it.
2. Run the "DIVA DB Full backup" scheduled task.
3. Run the "DIVA DB Backup sync" scheduled task.
4. Shutdown the DIVA Manager Server as cleanly as possible.

Perform these steps on the DIVArchive Backup Manager:

1. Change the IP Address to the Main Manager machine's address and reboot the machine.
2. Recover the database:
   a. Run **`%DIVA_HOME%\Program\DBBackup\rman\bin\restore_lib5_from_mgr1_to_mgr2.bat`**
   b. Choose **0** for **Automatic Restore** and wait for completion.
   c. Choose **0** for **Full Backup**.
   d. Choose **q** to quit.
3. Start the DIVArchive Services (*Manager, RobotManager, Storage Plan Manager, DFM, etc. depending on the configuration*).

The system should now be running from the new (*old Backup machine – now Main*) Main DIVArchive Manager machine allowing repair of the original Main Manager machine.

5 DIVArchive Configuration Utility Operations

5.1 Overview

All information relating to DIVArchive Objects that have been archived including (*but not limited to*) where they are stored, tape locations, DIVArchive System Configuration, etc., is all stored within the DIVArchive Database.

The DIVArchive Database is accessed by the DIVArchive Configuration Utility. This utility is only intended to be used by trained administrators, however from an operational perspective some functions of the utility may need to be occasionally accessed by non-administrators.

Operators should only access the Configuration Utility if they need to perform alterations of the attributes for one or more tapes, such as repack status or Set ID.

The utility can be installed and run on any host with TCP/IP connectivity to the DIVArchive Database, Manager, and RobotManager(s).

Contact your Oracle Support Specialist for more information.

Note: Disks or tape drives that have been set to Out of Order (*as displayed in the Disks or Drives views in the Control GUI*) should not have this status altered until the source of the problem is investigated and rectified by an Administrator.

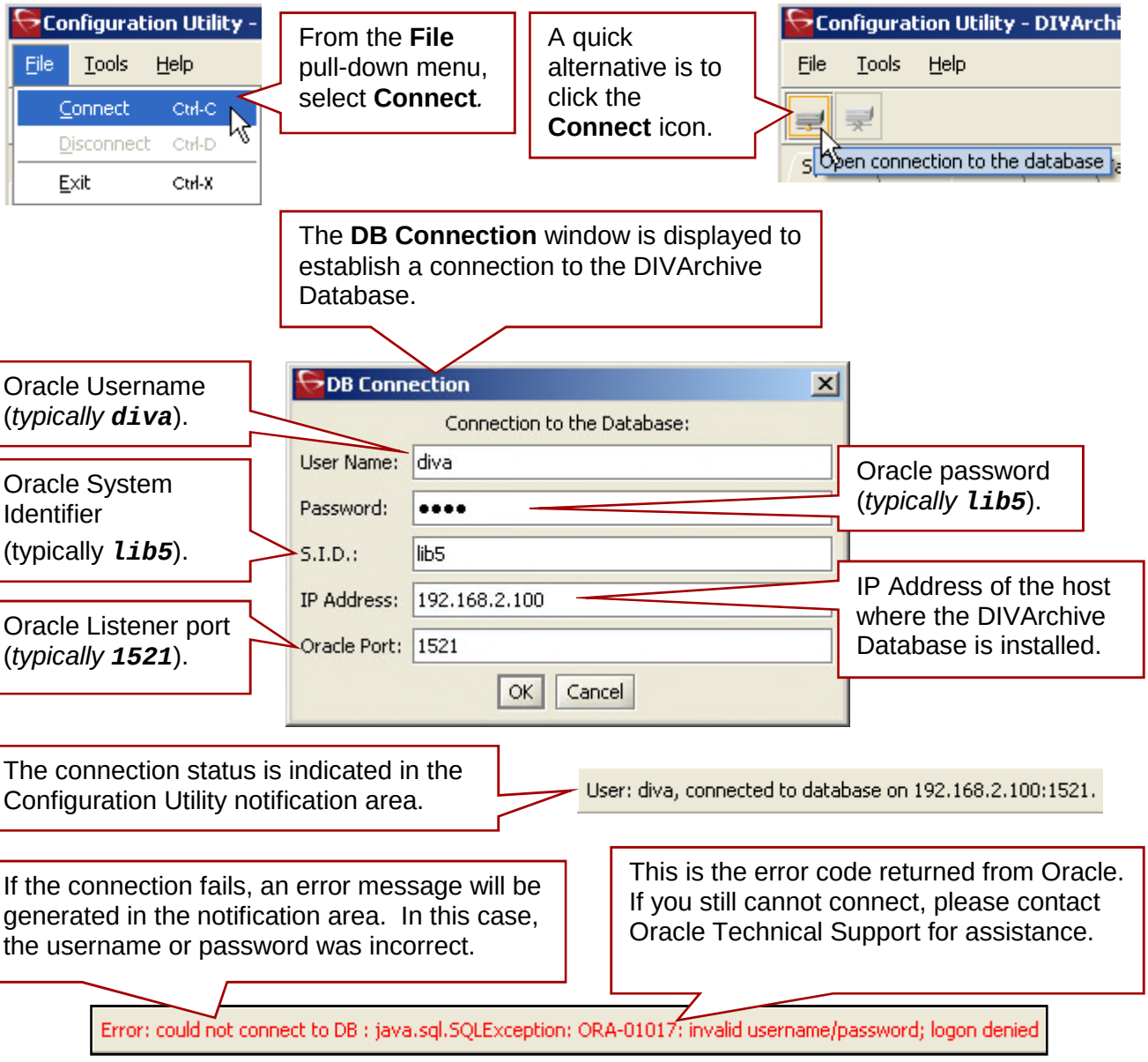
Warning: The Configuration Utility is intended only for experienced users. Incorrect or incomplete changes in the Configuration Utility can adversely affect DIVArchive operations (*and possibly even delete data from the archive*), or prevent the DIVArchive Manager from running. If you are unsure about changes you wish to make, please contact Oracle Technical Support for assistance.

5.2 Launching the Configuration Utility and Connecting to the DIVArchive Database

To launch the Configuration Utility, double-click on the **DIVA Configuration Utility** icon on the desktop:

Figure 84: Connecting the Configuration Utility to the DIVArchive Database

Connect to the DIVArchive Database using the following procedure:



5.3 Configuration Utility Tabs

The following subsections describe each tab within the DIVArchive Configuration Utility. For more information on each tab contact your Oracle Support Specialist.

5.3.1 System Tab

The **System Tab** defines key parameters for your DIVArchive installation and is the starting point for creating your DIVArchive Configuration.

A drawing of the system components should be made including; the data and control paths between them, how they will interact with each other, established naming conventions for resources such as disks, and the workflow of the platform before entering details into the Configuration Utility. Some parameters are difficult to change later on once they have dependencies from other configuration parameters in the database.

A transcoder is no longer coupled to a single actor. The transcoder is selected after the actor is selected; therefore users no longer need to define a LOCAL transcode actor as a destination. A local actor destination is dynamically and temporarily (*only in memory – not stored in the database*) created for the actor that is chosen as part of resource selection. The actor column was removed from the Transcoders area in the Configuration Utility. The transcoder server and cache location is now embedded in the **Working Directory** on the Transcoders Entry screen in the following format:

```
[actor:actor_name,transcoder:trancoder_ip_address],cifs://username:
password@\\transcoder_cache_ip_address\transcoder_cache”
```

Notes:

- **The original method of configuring Local Sources/Destinations tied to actors is still supported so legacy configurations will continue to function.**
- **If a transcoder address is not specified in the transcoder's working directory, a local transcoder address of 127.0.0.1 will be assumed as the transcoder address.**

Figure 85: Remote Working Directory Sample Entry

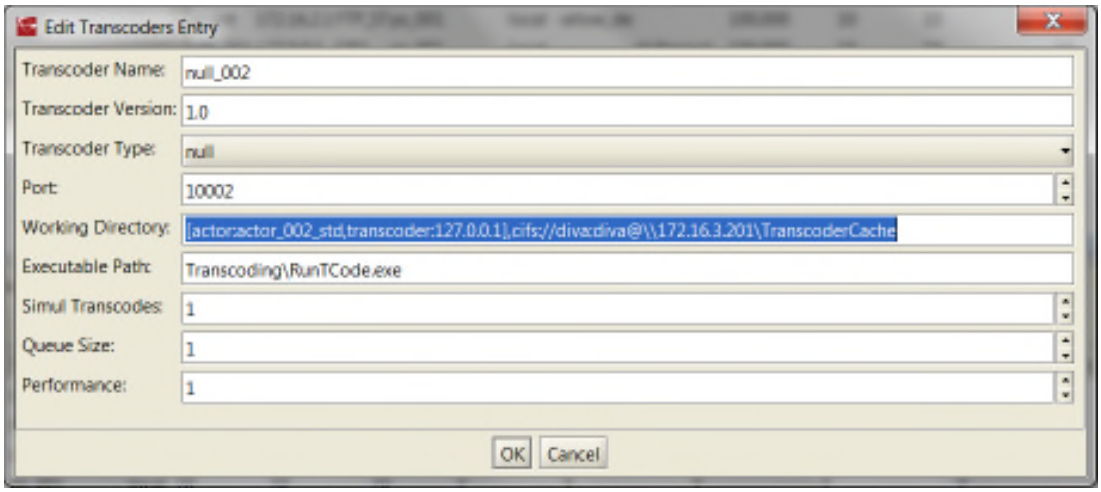
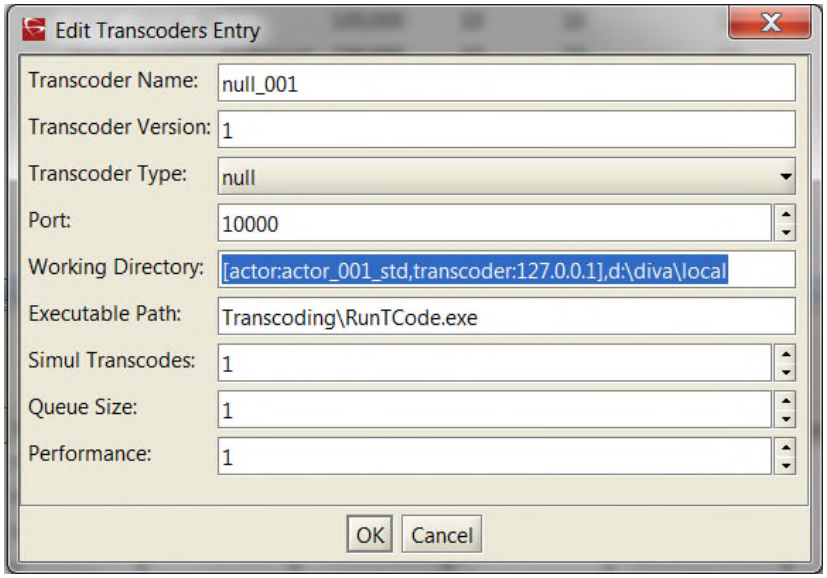
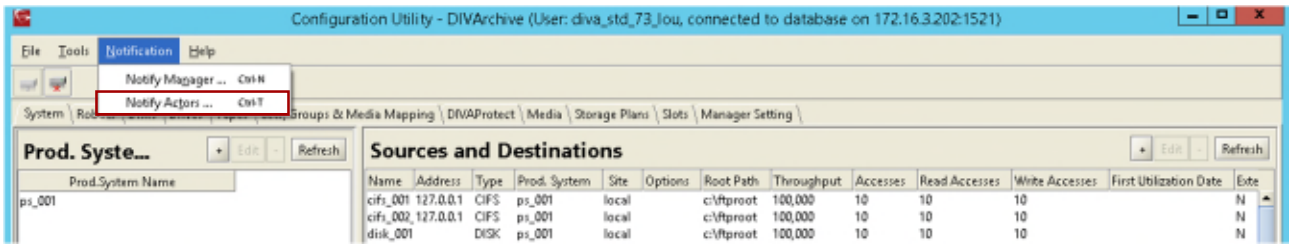


Figure 86: Local Working Directory Sample Entry



To notify the actors of any changes in the actor configuration, click on **Notification**, **Notify Actors** while connected to the Manager. The actors must be running and connected to the Manager to receive the notifications.

Figure 87: Notifying Actor of Configuration Changes



5.3.1.1 Syntax Examples

These syntax examples have been designed for Vantage. They can also be used with Flip Factory, but the **[transcoder…]** directives will be ignored, and the CIFS url will not be used to acquire the transcoder address. The **flipFactory.host** parameter of the actor/bin/transcoding/ffsubmitter.properties file will be used in place of the **[transcoder…]** directives.

Note: If a transcoder address is not specified in the transcoder's working directory, a local transcoder address of 127.0.0.1 will be assumed as the transcoder address.

- Shared transcoder with both the transcode engine and share on the same 10.201.10.21 host:

  cifs://diva:diva@\\10.201.10.21\VantageCache

- Transcode engine on actor1 (host 10.201.10.21):

  [actor:actor1],cifs://diva:diva@\\127.0.0.1\VantageCache

  or

  [actor:actor1],cifs://diva:diva@\\10.201.10.21\VantageCache

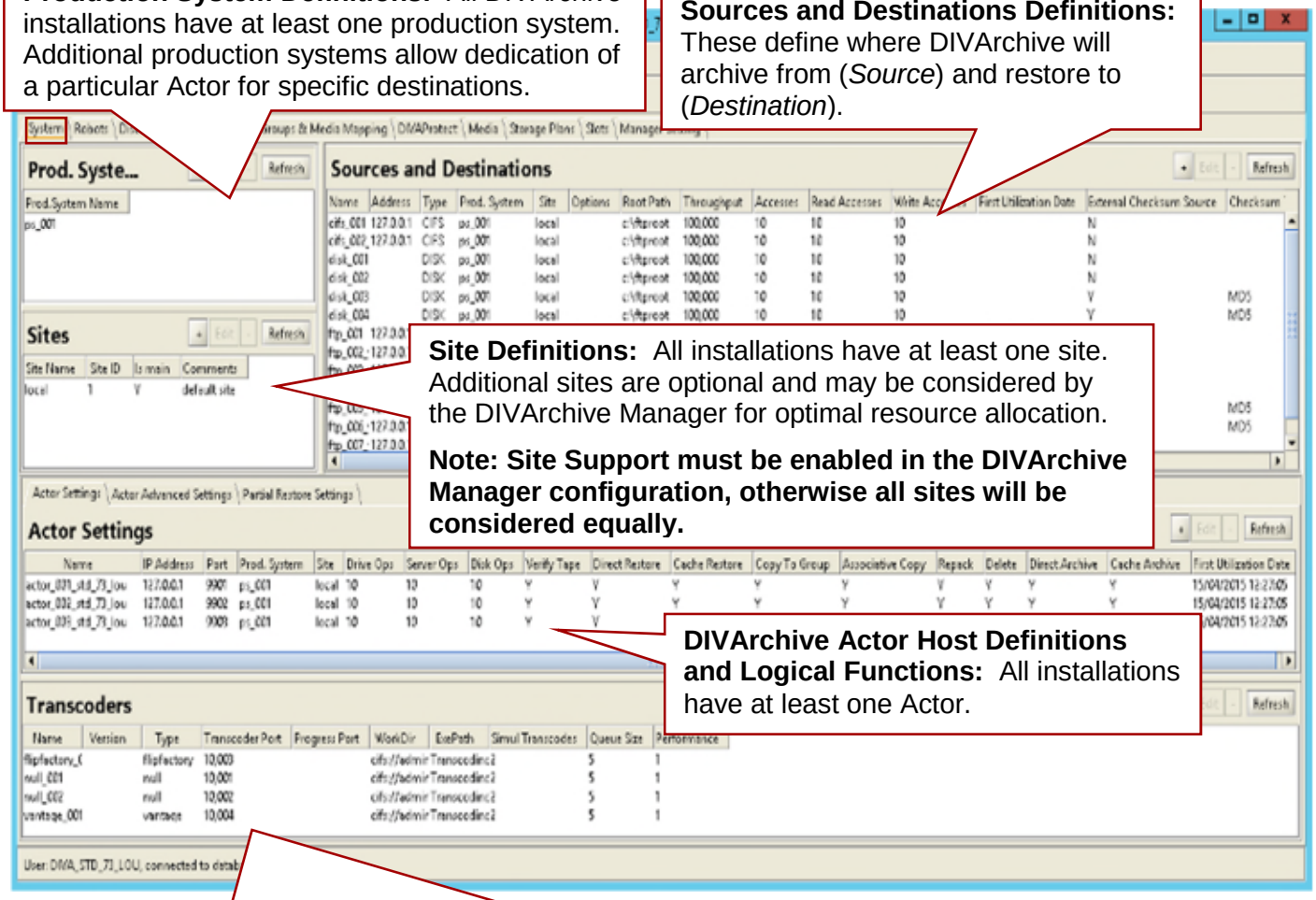
- Shared transcoder with transcode engine on host 10.201.10.101 and share on NAS host 10.201.10.250:

  [transcoder:10.201.10.101],cifs://diva:diva@\\10.201.10.250\VantageCache

- Shared transcoder with transcode engine on host 10.201.10.101 and share on NAS host 10.201.10.250 with forced actor selection:

  [actor:actor1,transcoder:10.201.10.101],cifs://diva:diva@\\10.201.10.250\VantageCache

Figure 88: DIVArchive System Tab Display Window



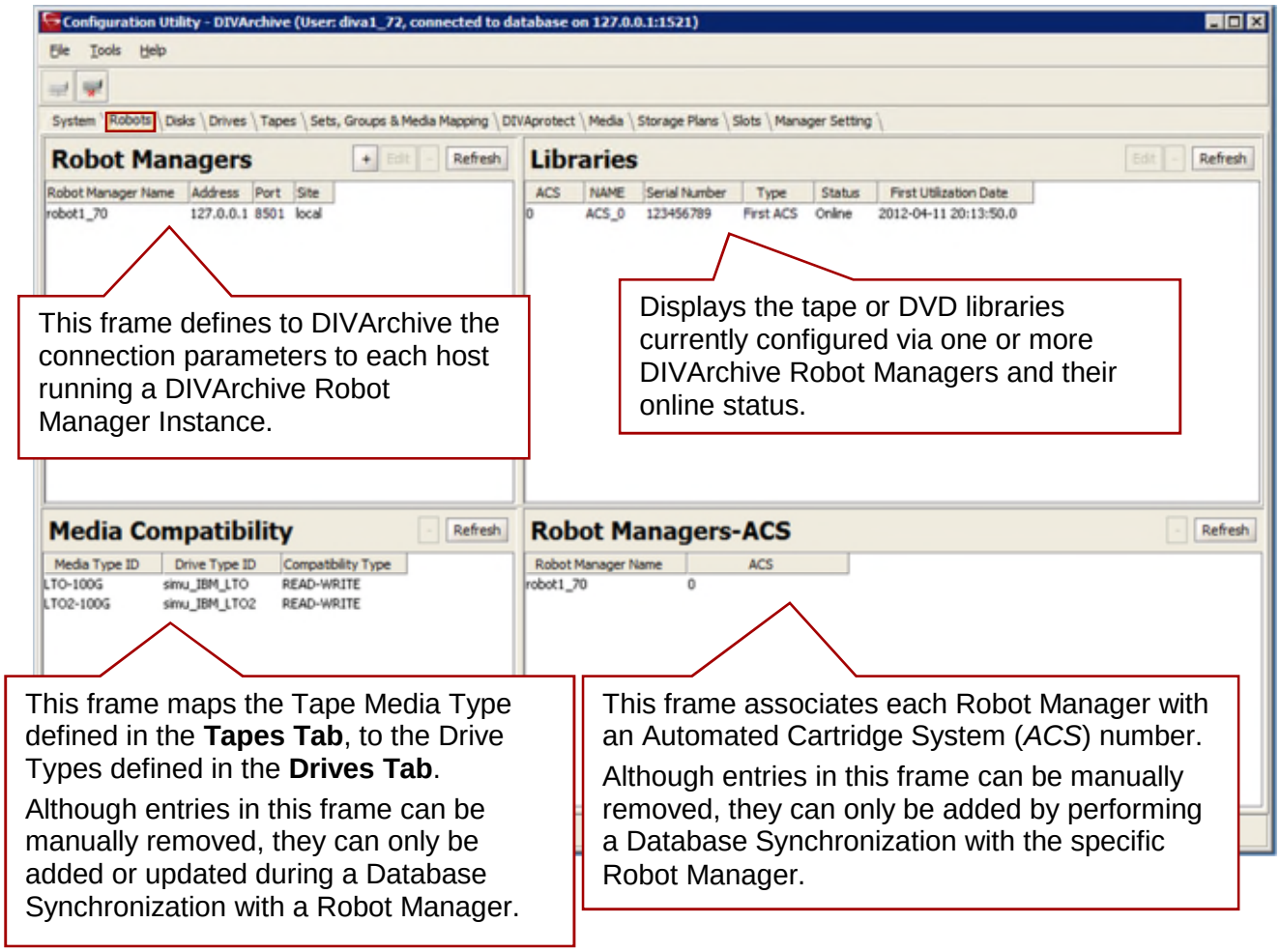
5.3.1.2 Actor Configuration in the Database

With the exception of the **Service Name** and **Port**, all actor configuration settings have been moved from the Actor Configuration and Partial Restore Configuration files to the Configuration Utility. These settings are now located under **Actor Advanced** and **Partial Restore Settings Tabs** of the **Actor Panel** of the **Systems Tab**. Some settings are only available In Engineering Mode. Contact your Oracle Support Specialist for configuration and parameter details.

5.3.2 Robots Tab

The **Robots Tab** is present in all DIVArchive installations (*although not every installation necessarily has a library*). It defines basic associations with the Robotics software and hardware components.

Figure 89: DIVArchive Robots Tab Window



This frame defines to DIVArchive the connection parameters to each host running a DIVArchive Robot Manager Instance.

Displays the tape or DVD libraries currently configured via one or more DIVArchive Robot Managers and their online status.

This frame maps the Tape Media Type defined in the **Tapes Tab**, to the Drive Types defined in the **Drives Tab**.

Although entries in this frame can be manually removed, they can only be added or updated during a Database Synchronization with a Robot Manager.

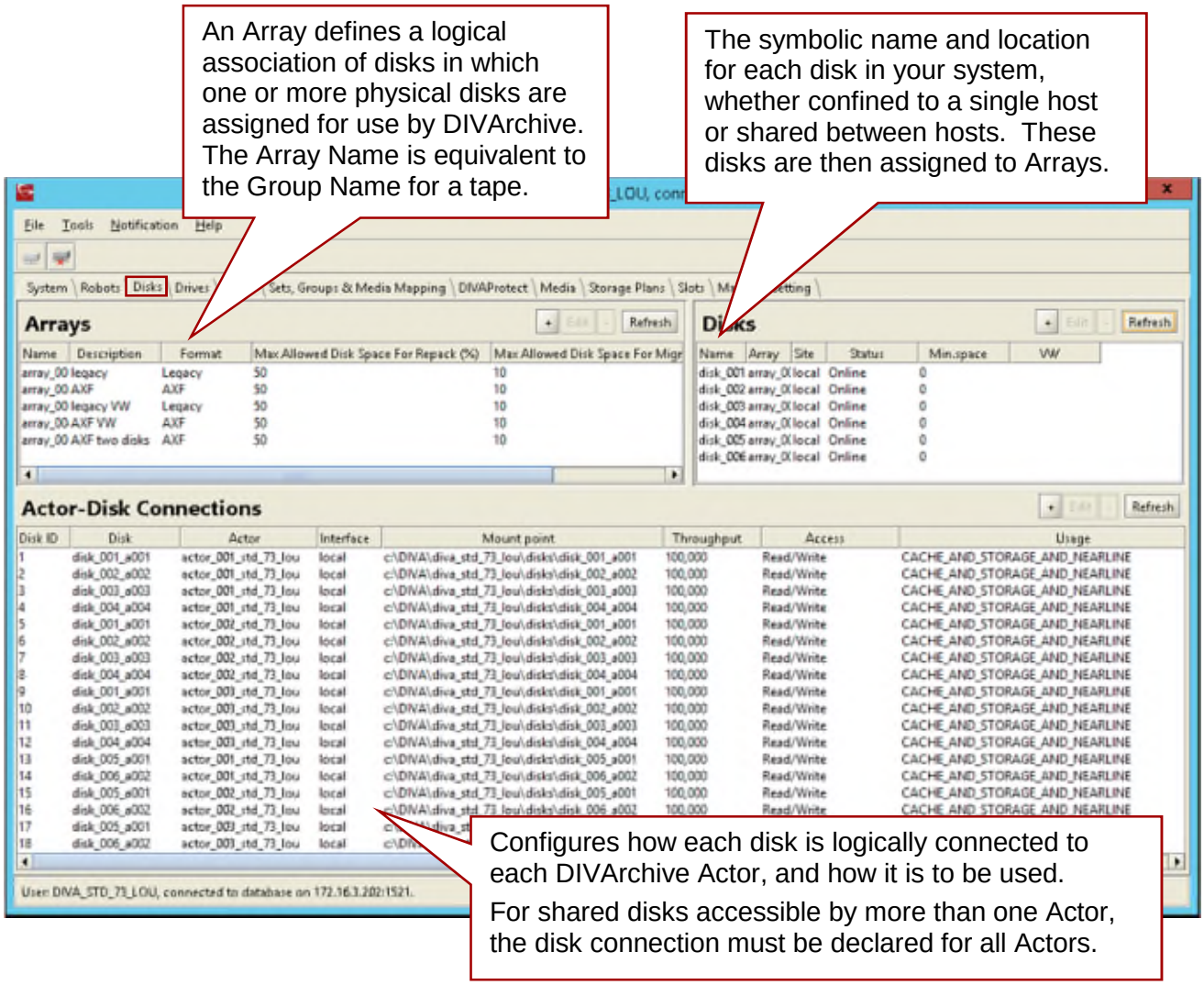
This frame associates each Robot Manager with an Automated Cartridge System (*ACS*) number.

Although entries in this frame can be manually removed, they can only be added by performing a Database Synchronization with the specific Robot Manager.

5.3.3 Disks Tab

The **Disks** Tab defines the physical disks that are to be used by DIVArchive, how they are grouped together for either permanent or cache storage, and how each disk is logically accessed by the Actors.

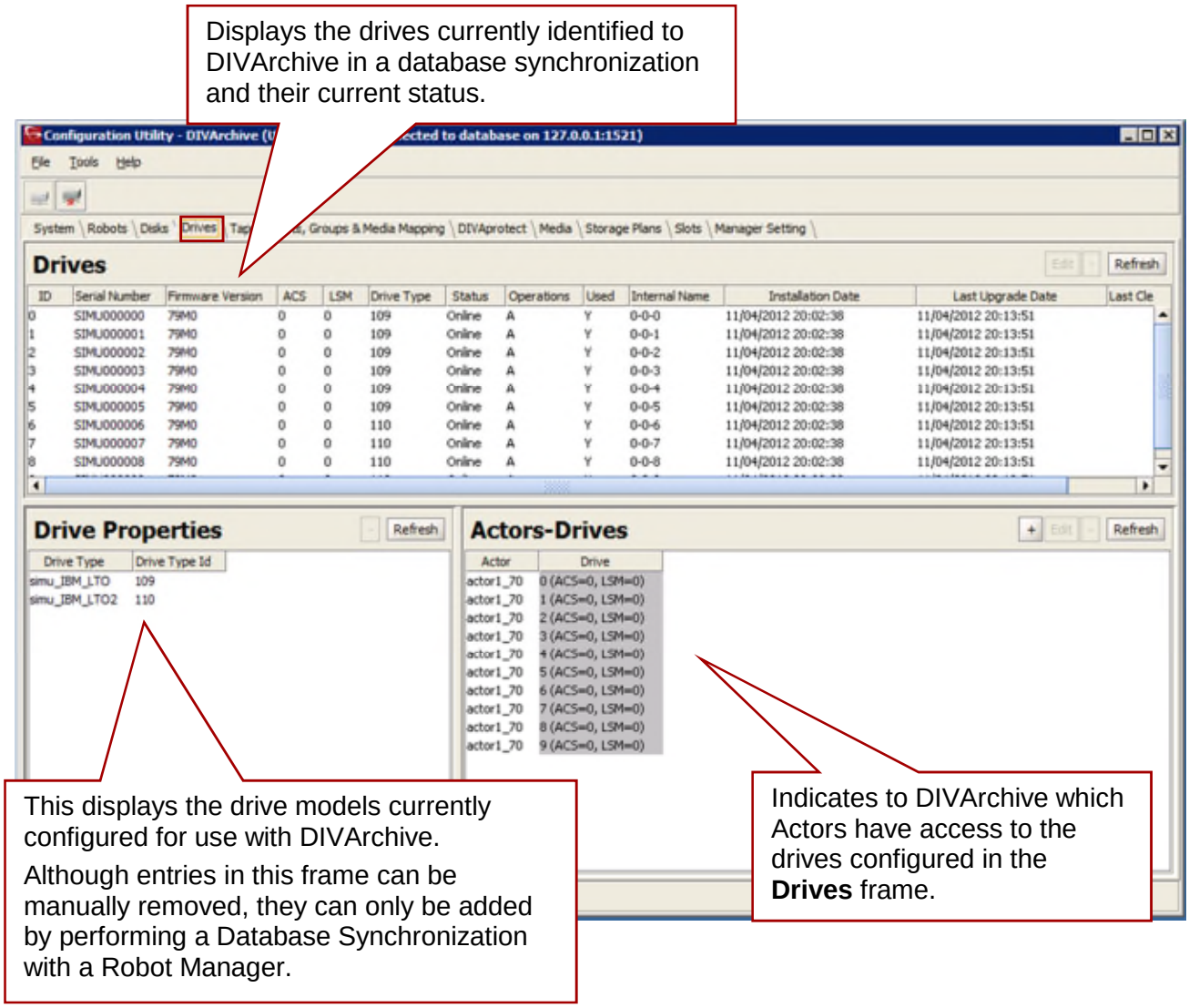
Figure 90: DIVArchive Disks Tab Window



5.3.4 Drives Tab

The **Drives Tab** is where the drives in your tape library(s) are identified and configured for use with DIVArchive and its Actors. In some installations, a tape library and its drives may be shared with other applications and the configuration options allow you to disable any of the identified drives from DIVArchive use.

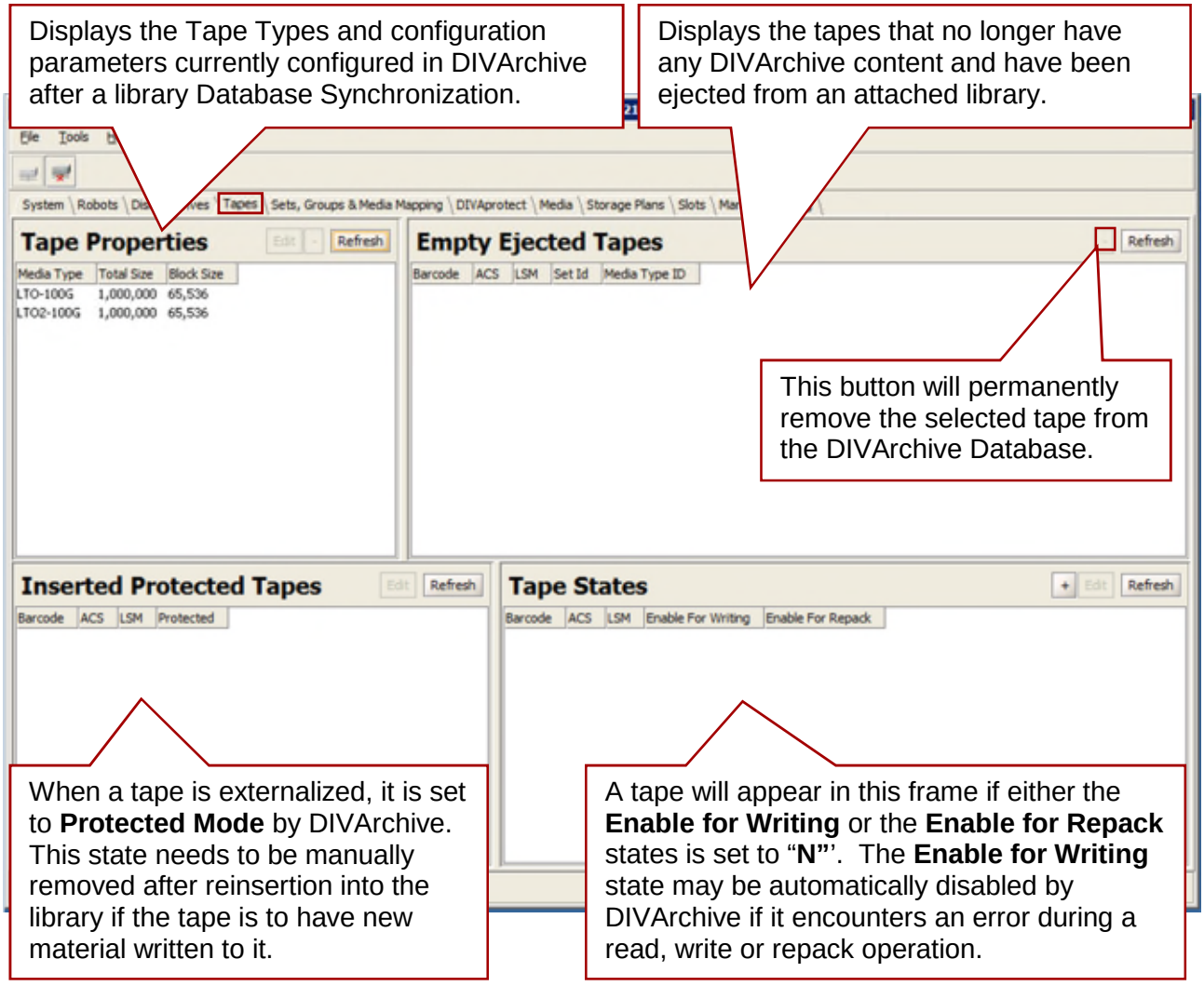
Figure 91: DIVArchive Drives Tab Window



5.3.5 Tapes Tab

The **Tapes Tab** is for the definition of each Tape Media Type capacity in DIVArchive, along with each individual tape's write, repack or "to be cleared" status. Tapes that do not contain any DIVArchive objects (*i.e. are empty or are from another archive application in a shared library environment*) and have been ejected from a DIVArchive managed library can also be deleted from the DIVArchive database in this tab.

Figure 92: DIVArchive Tapes Tab Window



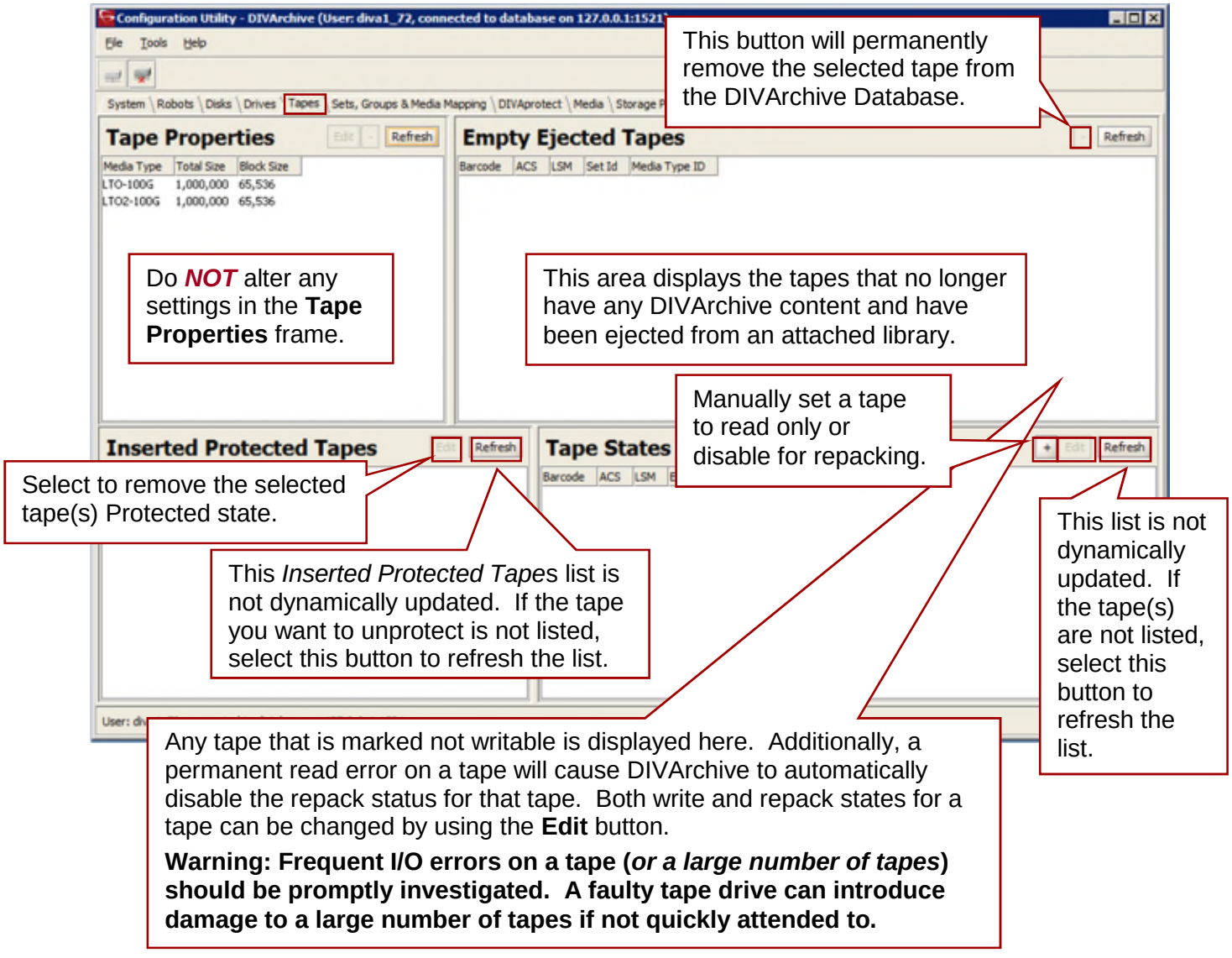
Note: The Tape States Frame gives an overall indication of the reliability of your tape drives. Tapes appearing in this frame (*if not manually inserted*) indicates that either a read or write error occurred on that tape during DIVArchive operations. If you have a large number of tapes present here this may indicate an issue with one or more of your tape drives and should be promptly investigated.

5.3.5.1 Altering the Status of a Tape

The **Tapes Tab** in the Configuration Utility can be used to alter the following states for one or more tapes. However, WORM Media marked as **NOT-WRITABLE** cannot be marked **WRITABLE** via the Configuration Utility.

- The Protected status (*as determined in the Tapes View of the Control GUI*). You would normally only remove this state if the tape was removed in error from the library and still requires material to be written to it.
- Remove tapes from the DIVArchive Database that no longer contain any DIVArchive objects (*i.e. all objects from the tape have been migrated to another tape or have been deleted*) and have been externalized from a DIVArchive attached library. These could be faulty tapes that will never be reused by DIVArchive, or tapes that are used by a 3rd party backup application that shares a DIVArchive attached library.
- Alter the read-only or repack status for one or more tapes.

Figure 93: Configuration Utility Tapes View



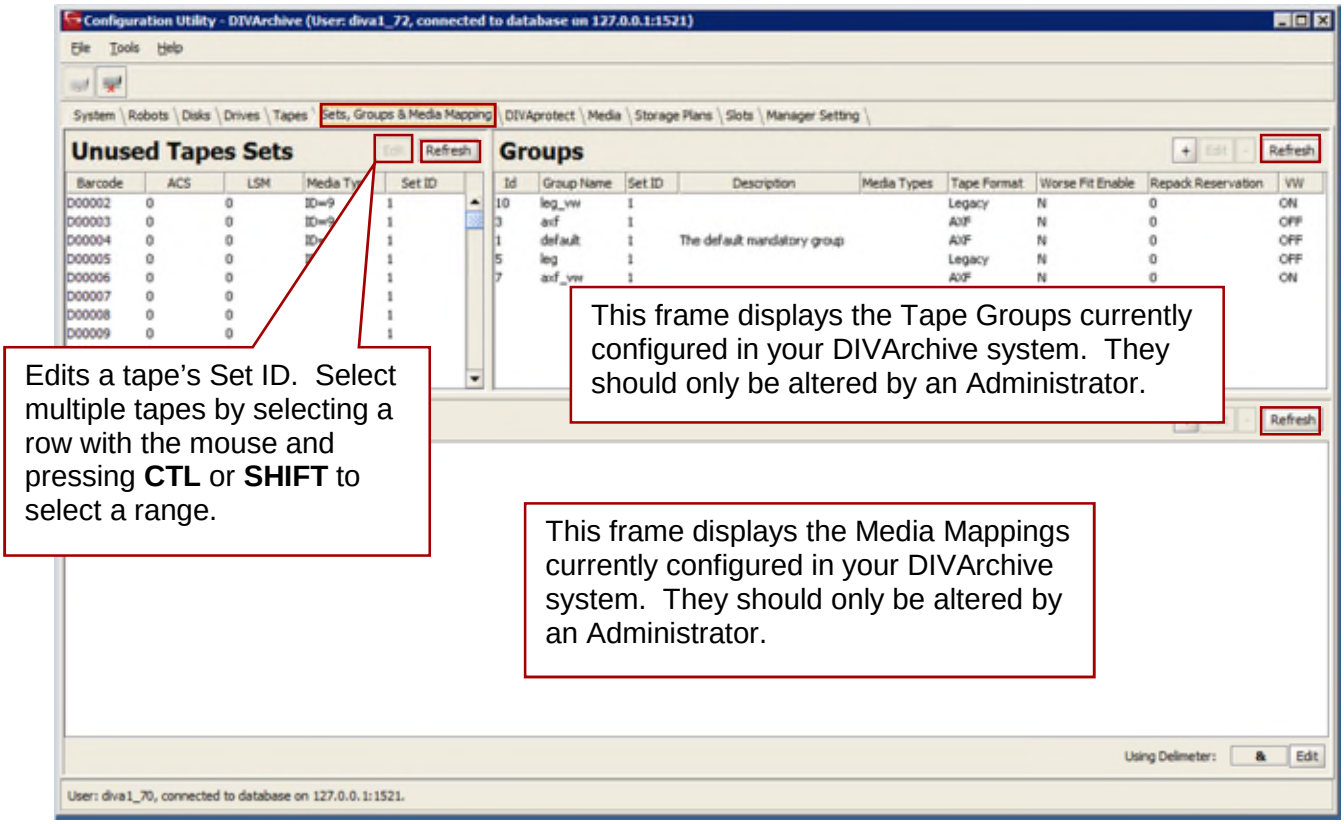
5.3.5.2 Assigning Tapes to Set ID's

When new tapes are inserted (*using the Insert Tape command from the Control GUI*) they are automatically assigned the default Set ID of 1.

If the tapes that were inserted should belong to a different set (*e.g. multiple Set ID's have been used to differentiate media types in mixed drive environments*) they must be manually updated with the correct Set ID in the Configuration Utility.

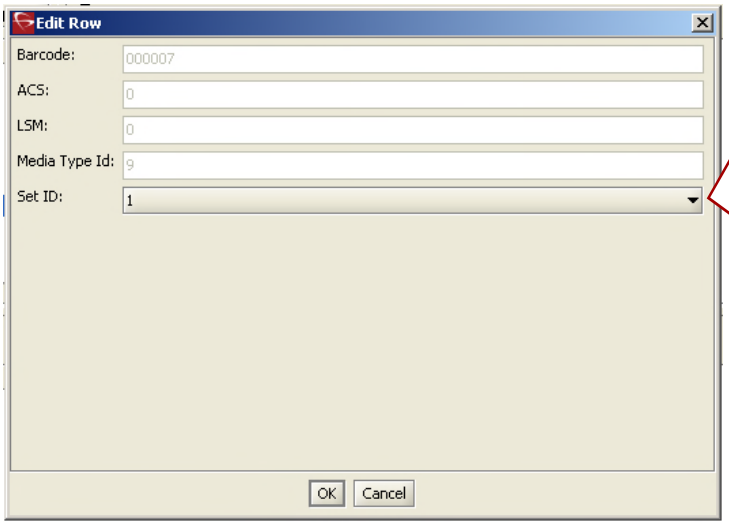
The lists are not dynamically updated. If the tape(s), Groups, and/or Media Mappings needed are not listed, select the appropriate **Update** button (*outlined in red in the figure below*) to refresh the list.

Figure 94: Configuration Utility Sets, Groups & Media Mapping Tab



When the **Unused Tape Sets** frame **EDIT** button is clicked, the window below is displayed indicating the parameters for the selected Tape Set.

Figure 95: Tape Edit Row Window



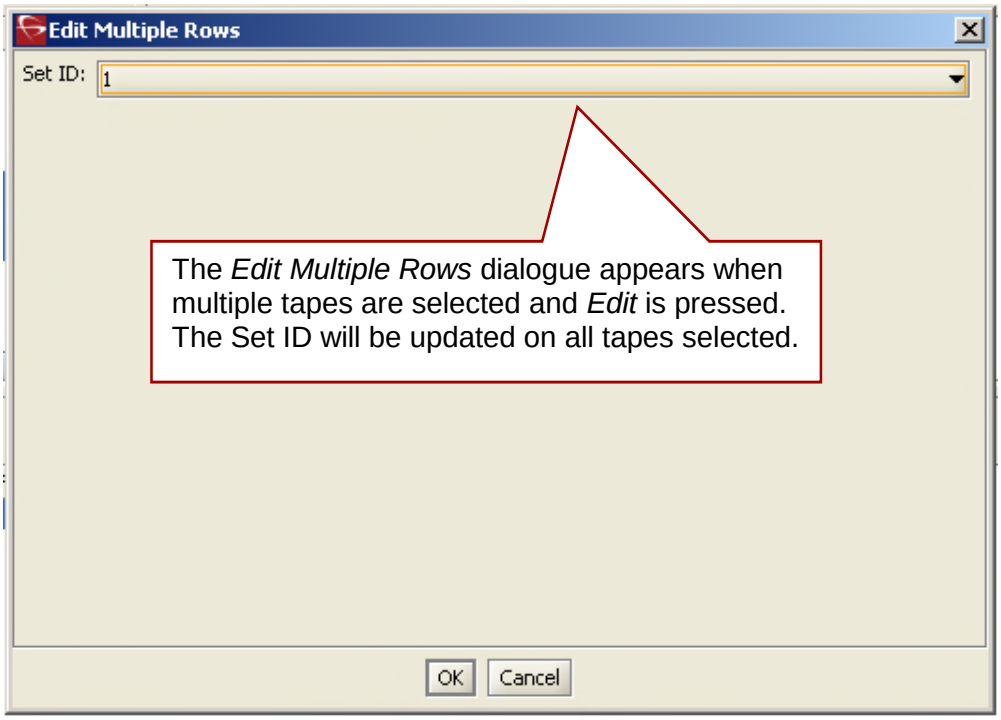
Select the Set ID for the tape from the drop down menu.

Setting the Set ID value to 99 indicates that the tape is not to be used by DIVArchive. This particularly applies to cleaning tapes installed in the library if they are reported to DIVArchive after a library audit (*typical barcode is CLNXXXX*).

This also applies to some installations where DIVArchive shares it's libraries with other applications; tapes in use by those applications should also have their Set ID set to 99 to prevent DIVArchive from using them.

The **Edit Multiple Rows** dialogue (*shown below*) appears when multiple tapes are selected and **Edit** is pressed. The Set ID will be updated on all tapes selected.

Figure 96: Edit Multiple Tape Set IDs Window

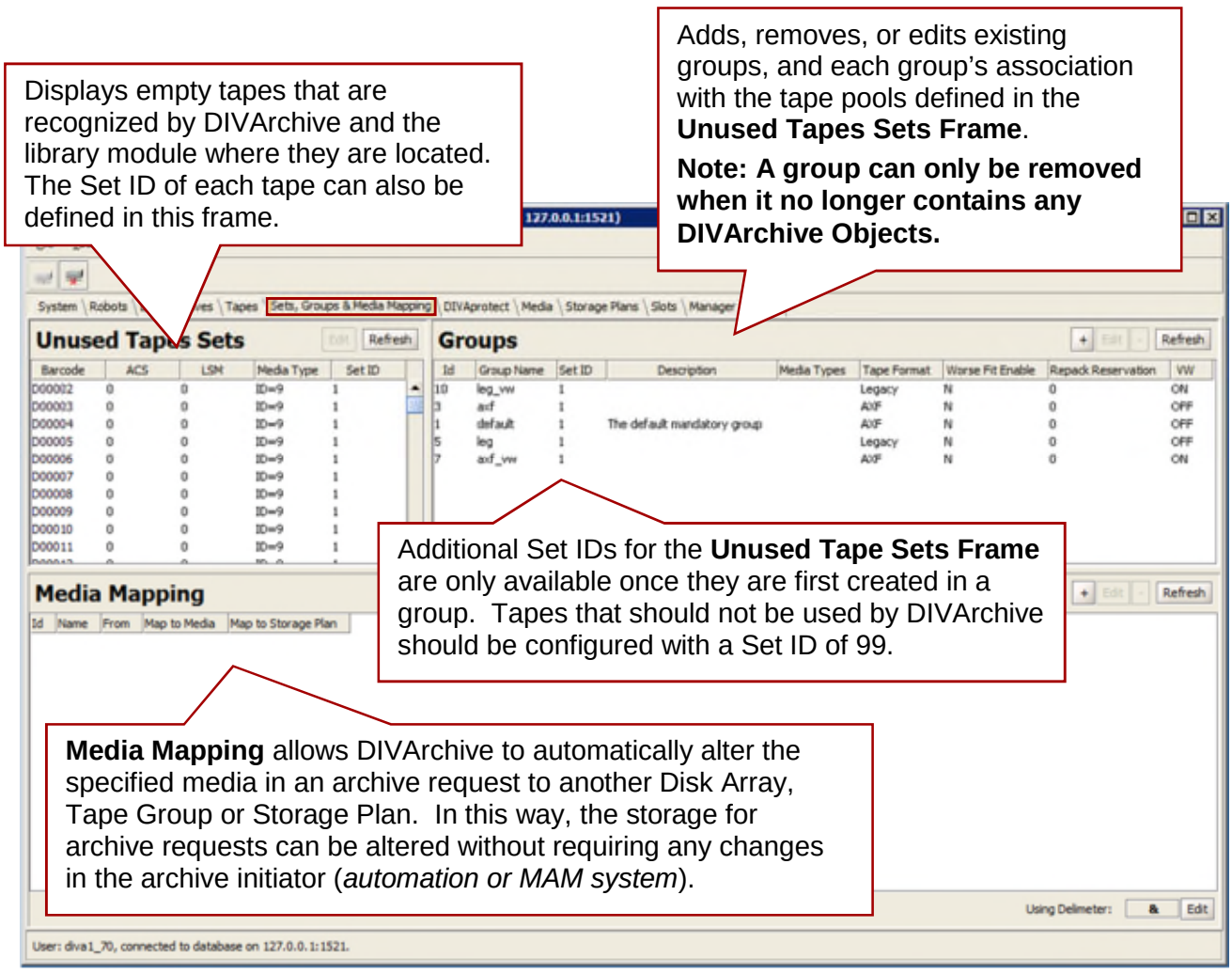


5.3.6 Sets, Groups & Media Mapping Tab

The **Sets**, **Groups & Media Mapping Tab** is used to allocate new tapes into pools for use by DIVArchive. Each media pool is represented by its **Set ID**. The Set ID is typically used to distinguish different types of tape media; however, it may also be used to dedicate a specific set of tapes to specific groups.

A **Group** is a logical name for the storage of DIVArchive objects. Each group is assigned a Set ID of tapes to draw upon. Each group can only be assigned one Set ID. Several groups can share the same Set ID.

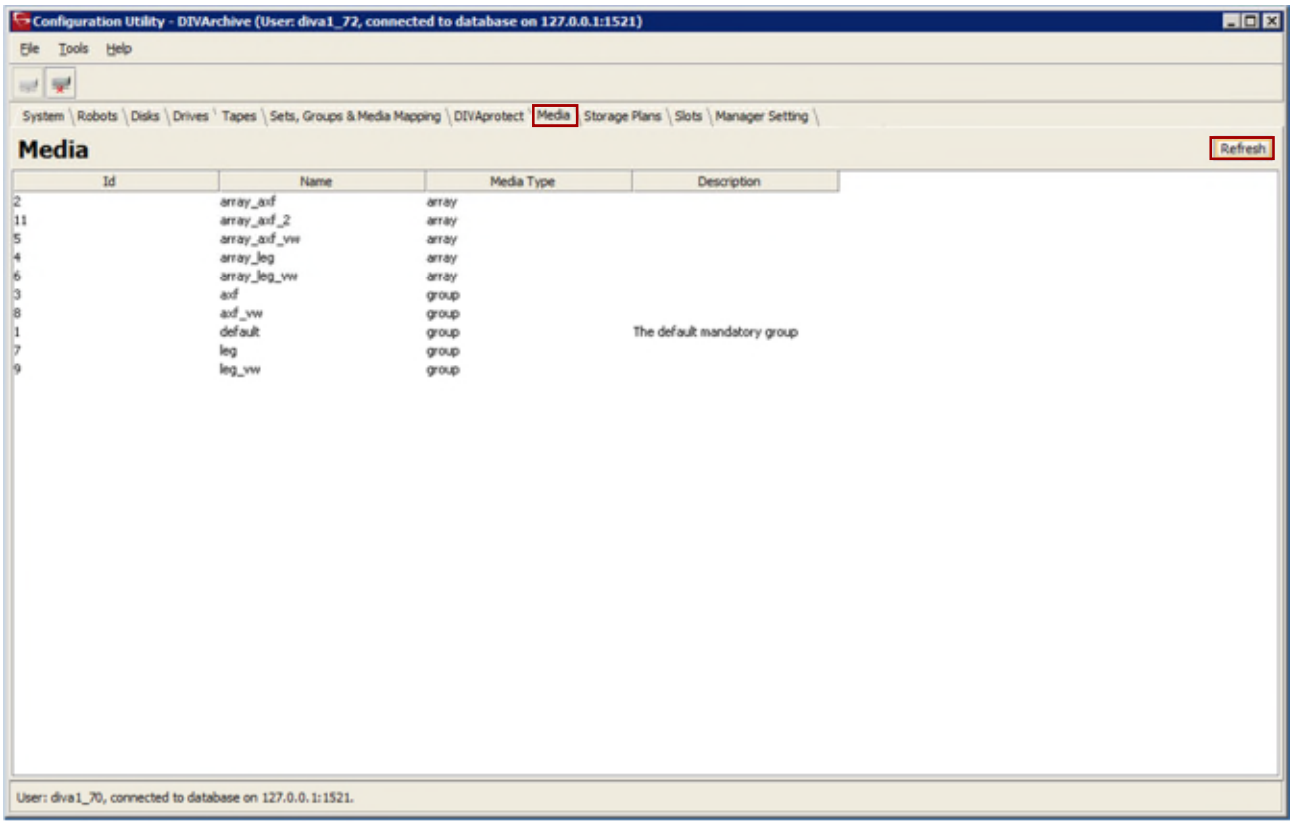
Figure 97: Configuration Utility Sets, Groups & Media Tab



5.3.7 Media Tab

The **Media Tab** displays information (*properties*) of the media identified in the DIVArchive System. The display is for informational purposes and read only. Use the **Refresh Button** to refresh the displayed list.

Figure 98: Configuration Utility Media Tab

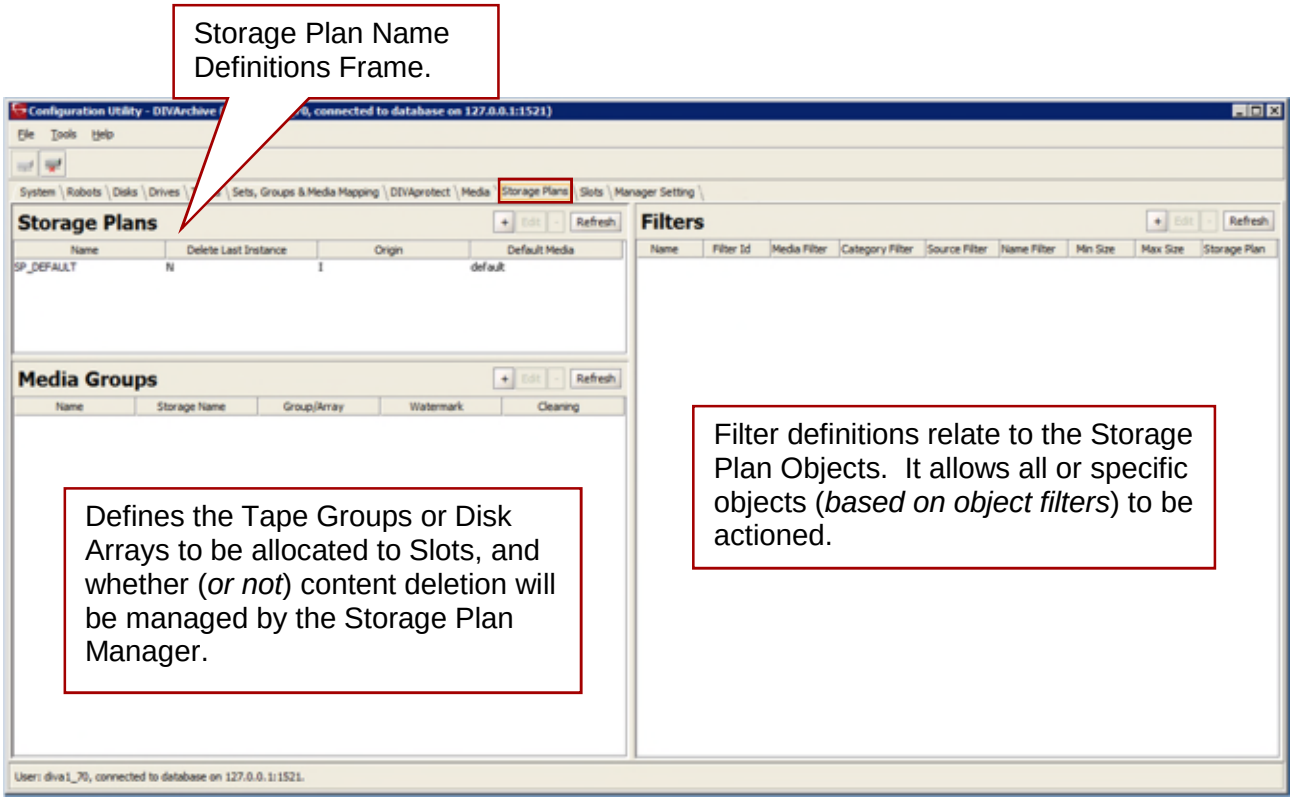


5.3.8 Storage Plans Tab

The **Storage Plans Tab** allows you to create simple and advanced rules for automated management and movement of material within the archive.

For detailed configuration information, refer to the *Oracle DIVArchive Storage Plan Manager (SPM) Guide* in the DIVArchive Additional Features Documentation library.

Figure 99: Configuration Utility Storage Plans Tab Window

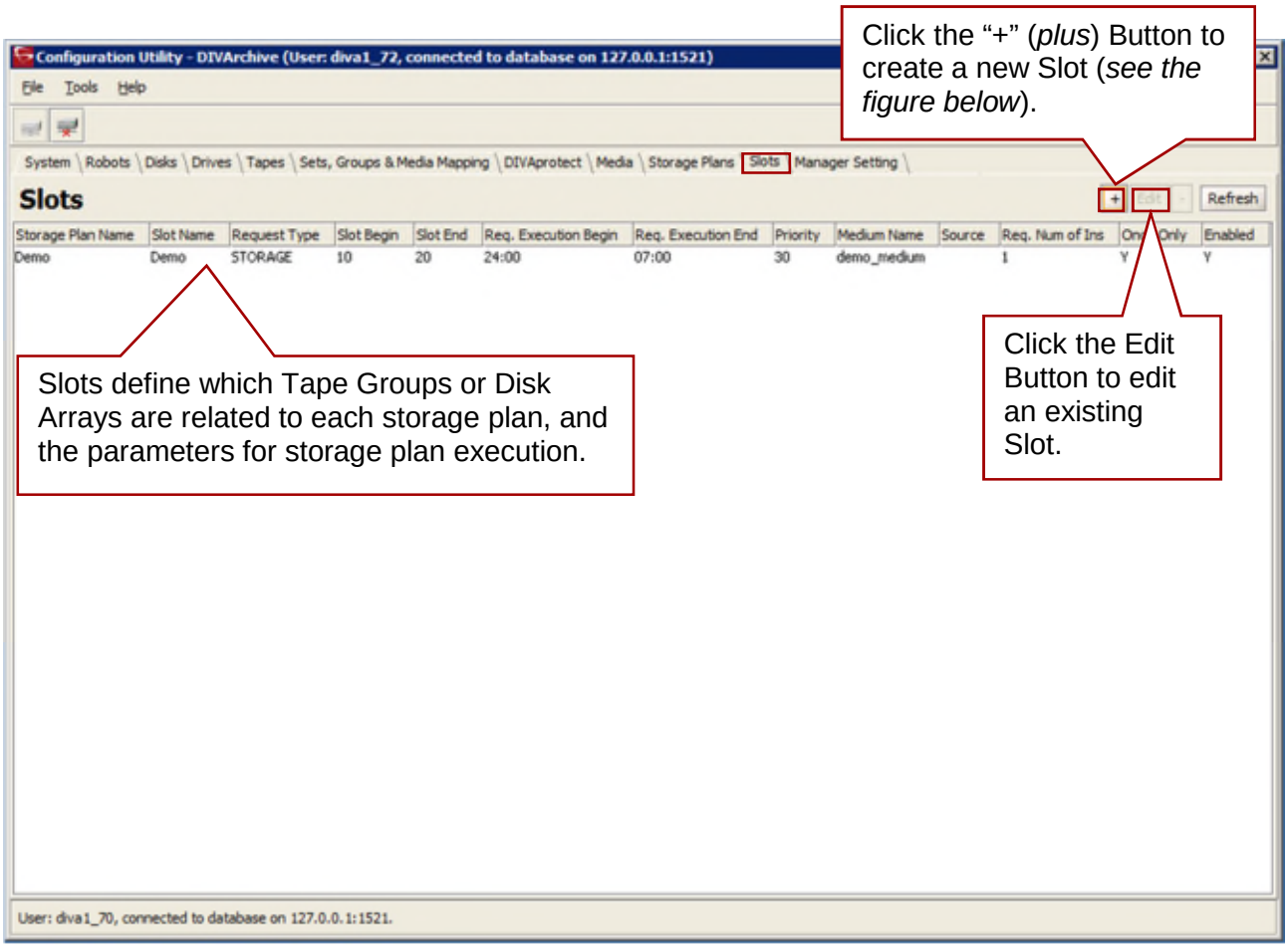


5.3.9 Slots Tab

This tab defines the Slots associated with the Storage Plans for the Storage Plan Manager.

Refer to the *Oracle DIVArchive Storage Plan Manager (SPM) Guide* in the DIVArchive Additional Features Documentation library for more details.

Figure 100: Configuration Utility SPM Actions Tab Window



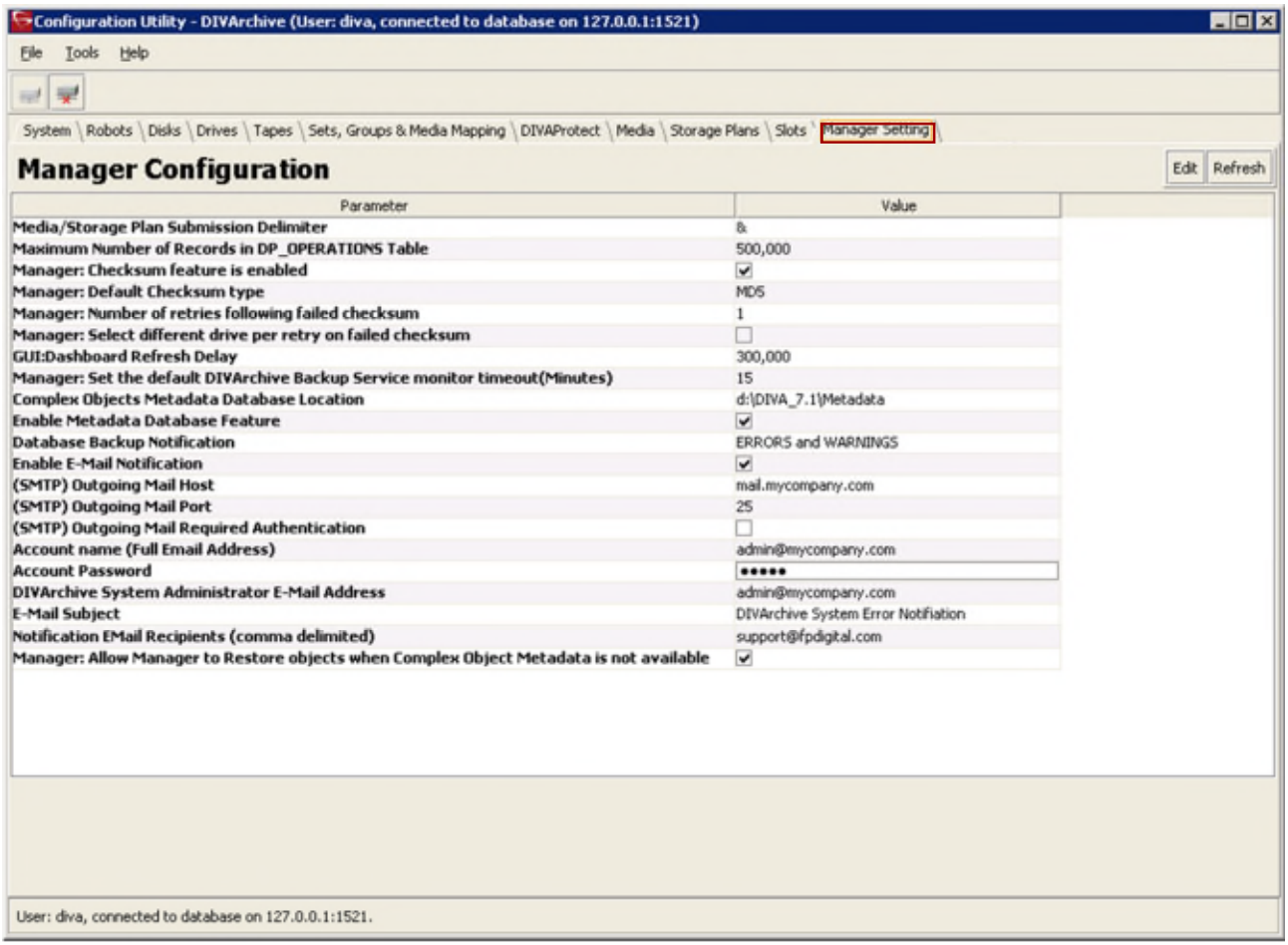
Note: SPM will now retry failed copy, delete and restore actions after the configured failed action retry interval as set in the SPM configuration file. Refer to the *Oracle DIVArchive Storage Plan Manager (SPM) Guide* in the DIVArchive Additional Features Documentation library for detailed information.

5.3.10 Manager Settings Tab

The **Manager Setting Tab** in the **Configuration Utility** is used to set several parameters related to the Media, Checksum, Complex Objects, and the Metadata Database.

Contact your Oracle Support Specialist for more information.

Figure 101: Configuration Utility Manager Settings Tab Window – Engineer Mode



6 DIVArchive Control GUI Operations

6.1 Control GUI Design

The DIVArchive Control GUI (*Graphical User Interface*) is a software utility that connects to both the DIVArchive Manager, and the DIVArchive Database, to monitor, control, and supervise operations in DIVArchive. Multiple DIVArchive Control GUI instances can be operated simultaneously from any machine that has TCP/IP connectivity to both the DIVArchive Manager and DIVArchive Database.

The Control GUI is not intended for the intensive archive operations of a DIVArchive System. Typically, archive operations are initiated to DIVArchive from a Broadcast Automation or MAM (*Media Asset Management*) system. The Control GUI is intended to supplement these operations rather than replace them.

The Control GUI design enhances the user experience and allows for easy manipulation of the DIVArchive System while adding easy access to the new functionality version 7.3 offers. Refer to Section 6.6.1 for more information about the Control GUI Dashboard.

The application provides the following features:

- Monitoring of the requests that have been submitted either through the DIVArchive Client API, or from a Control GUI.
- Monitoring of the status of the Actors, Drives, and Disks connected to DIVArchive.
- Initiate all DIVArchive Client API available commands, such as archive, restore, partial file restore, etc., and submit them to DIVArchive for execution.
- Management of tapes for each library controlled by DIVArchive (*such as internalizing, externalizing, or tape repacking*).
- Interrogation and data mining of the DIVArchive Database.
- Multiple instances of the Control GUI can be connected to DIVArchive simultaneously.
- The Control GUI is based on Java, and is platform independent.

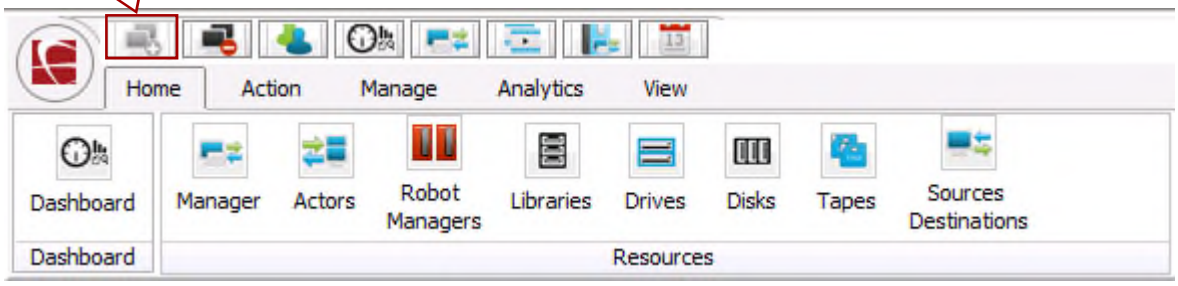
Refer to DIVArchive Request Types and contact your Oracle Support Specialist for more information on DIVArchive Request Types.

6.2 Launching the Control GUI and Connecting to the DIVArchive Manager

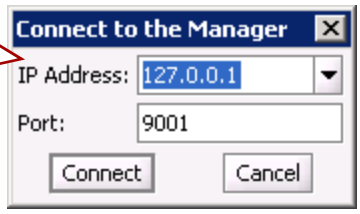
Figure 102: Process for Launching the Control GUI and Connecting to the Manager

Step 1: Double click the Control GUI icon to launch the DIVArchive Control GUI.

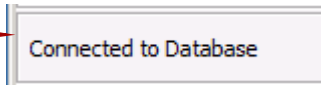
Step 2: When the Control GUI has finished opening, select the **Connect** icon.

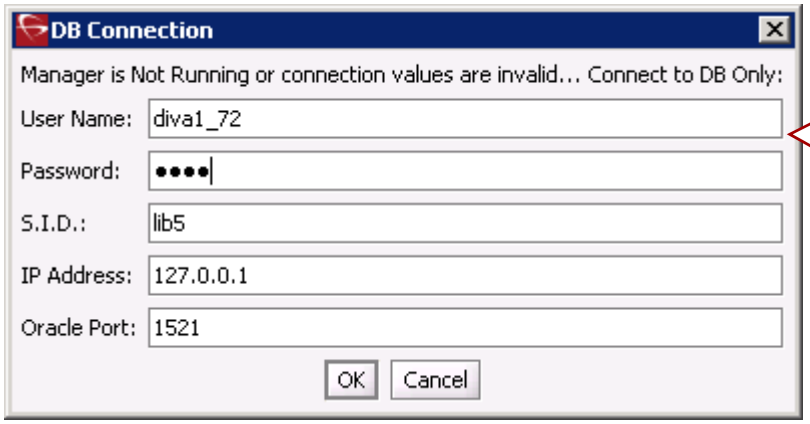


Step 3: In the Connect dialogue box, enter the IP address and TCP port of the DIVArchive Manager, and select **Connect**.



If the connection is successful, the Control GUI will show **Connected** in the connection status area (*at the bottom of the screen on the left*).





If the Control GUI cannot establish a connection the DIVArchive Manager, it will attempt to connect to the DIVArchive Database only.

Consult your DIVArchive Delivery Plan for the connection parameters at your site.

6.3 User Permissions

After the connection to the DIVArchive Manager is established, the Control GUI will only allow the user to monitor DIVArchive operations, and retrieve data from the database. This is known as the **User Profile**.

To issue requests to DIVArchive, such as archive or restore requests, or to eject a tape from a library, you must change to the **Administrator Profile**.

The Administrator Profile is password protected. The default password for this profile is **`diva`**, however this can be (*or should have been*) changed in the Configuration Utility (*contact your Oracle Support Specialist for help changing this password*).

An additional profile is also available called the **Operator Profile**. The password for this profile matches that of the Administrator Profile.

Not all functions that issue commands to DIVArchive are accessible while in the **User** profile mode. This allows for situations where monitoring is required but no commands are permitted to be sent to DIVArchive.

Figure 103: Action Tab – User Profile

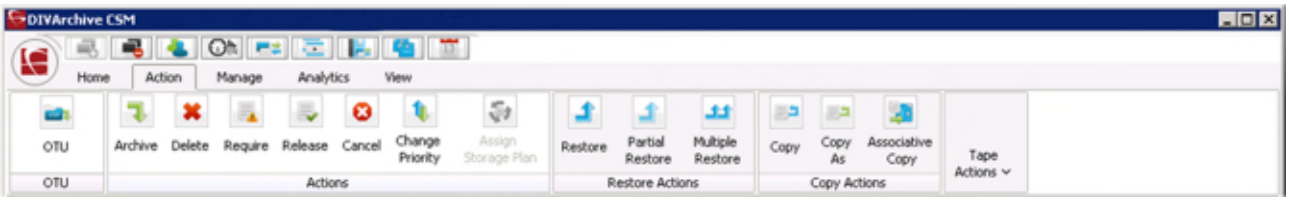


Figure 104: Change User Profile Quick Button

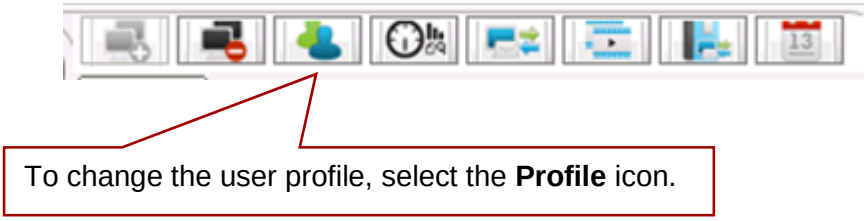


Figure 105: Change User Profile Menu Item

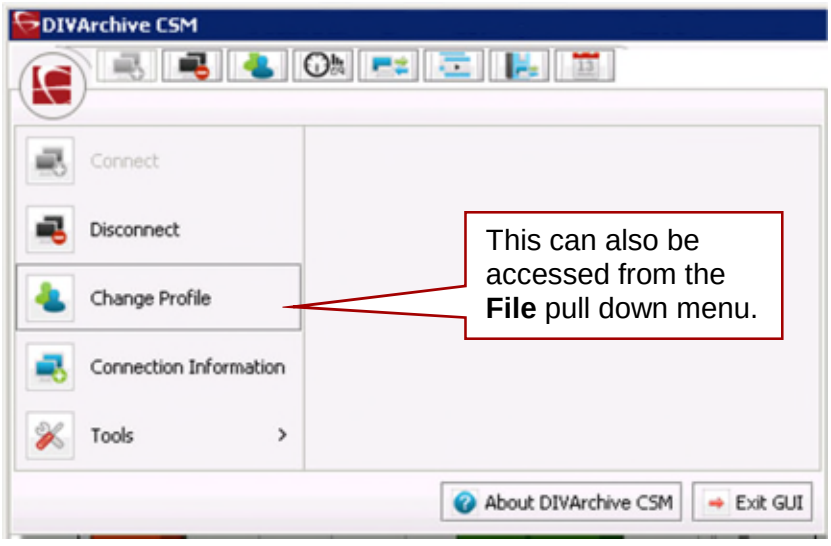
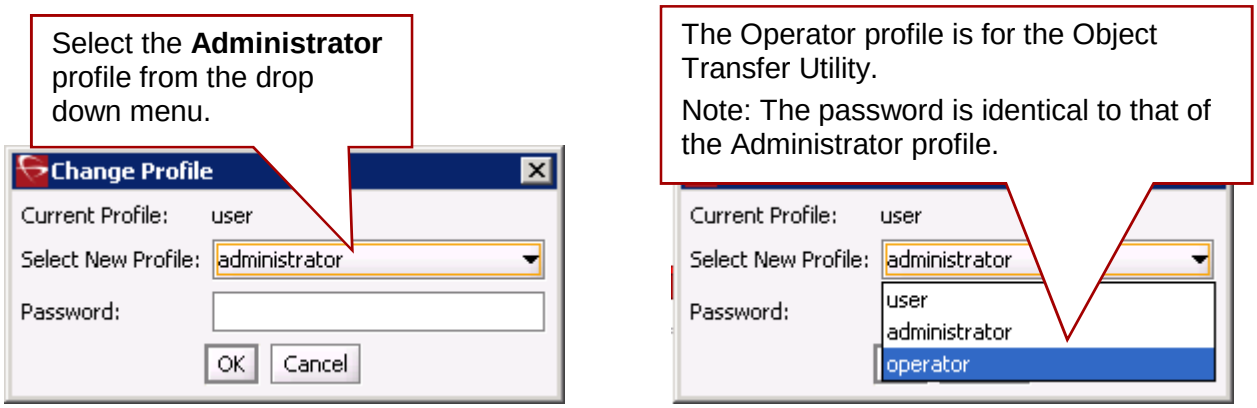


Figure 106: Changing the User Profile Mode



6.4 Control GUI Preferences

The Control GUI **Preferences** option allows you to specify the maximum number of rows to be displayed in the Manager's **Current Requests View**, or the number of rows to be returned in database related views or forms.

Additionally, the display fonts used in the Control GUI can also be customized. In DIVArchive 7.3, the default font for the Control GUI is Arial Unicode MS – which support Unicode characters.

Figure 107: Control GUI Start Menu

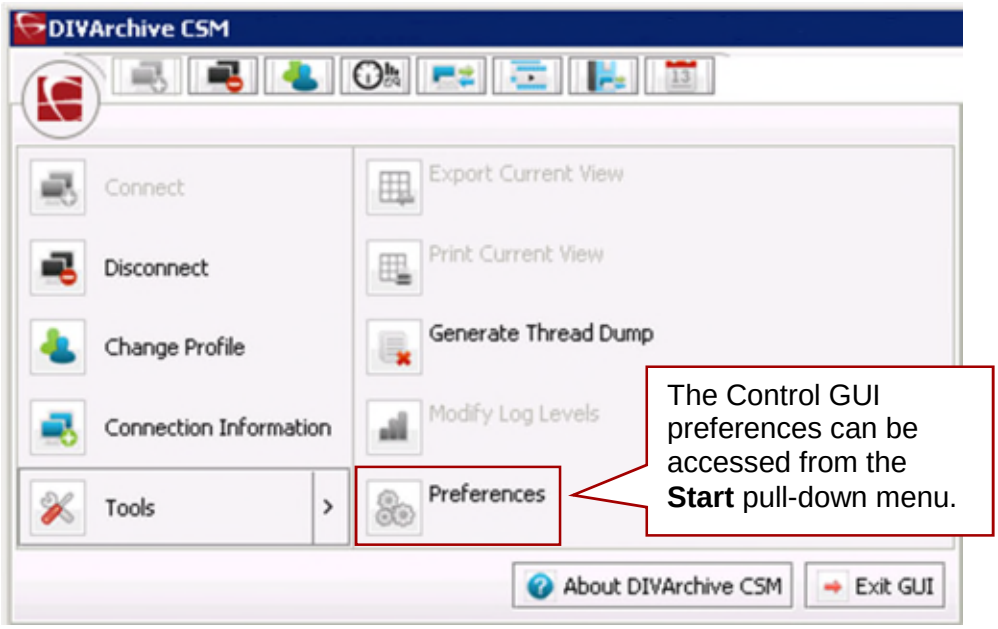


Figure 108: Control GUI Preferences – Preferences Tab

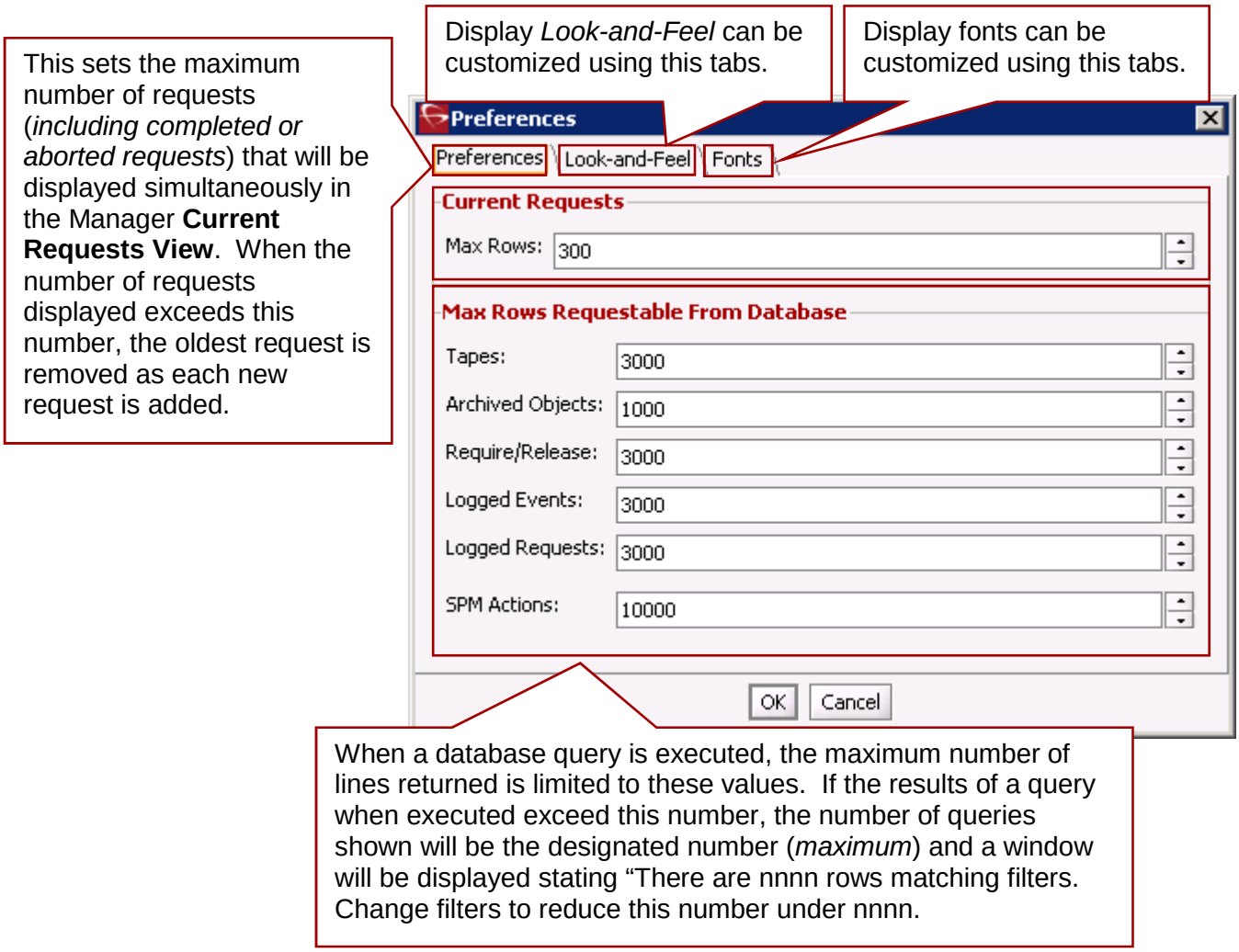


Figure 109: Control GUI Preferences – Look and Feel Tab

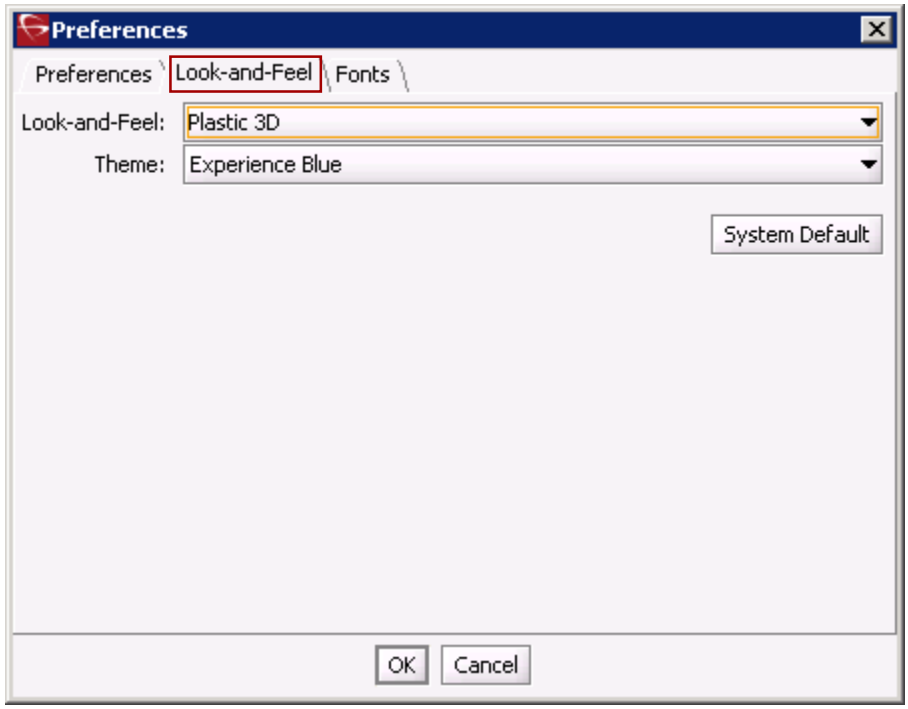
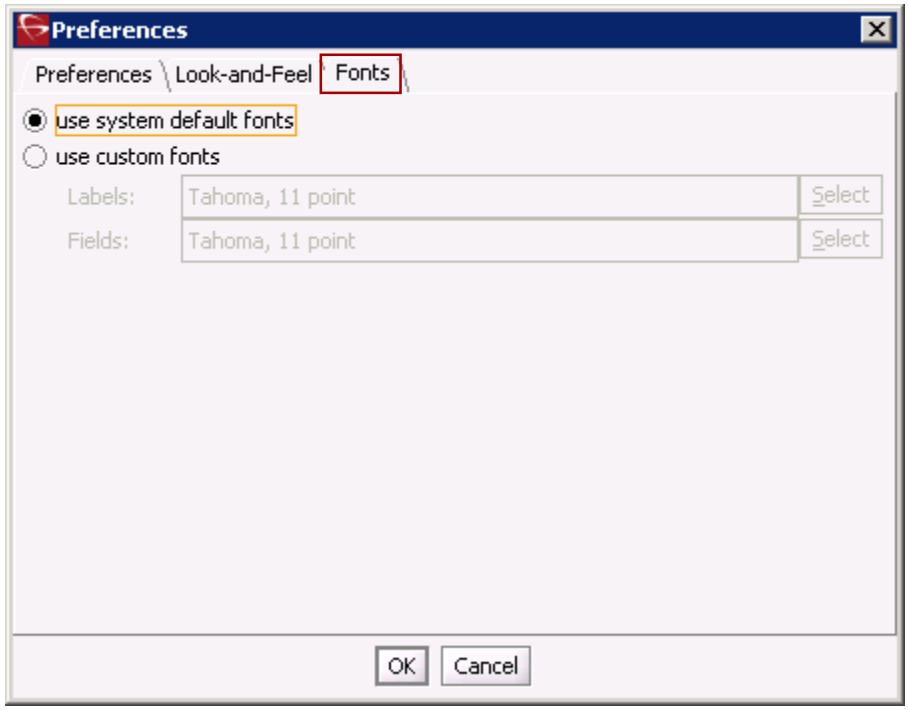


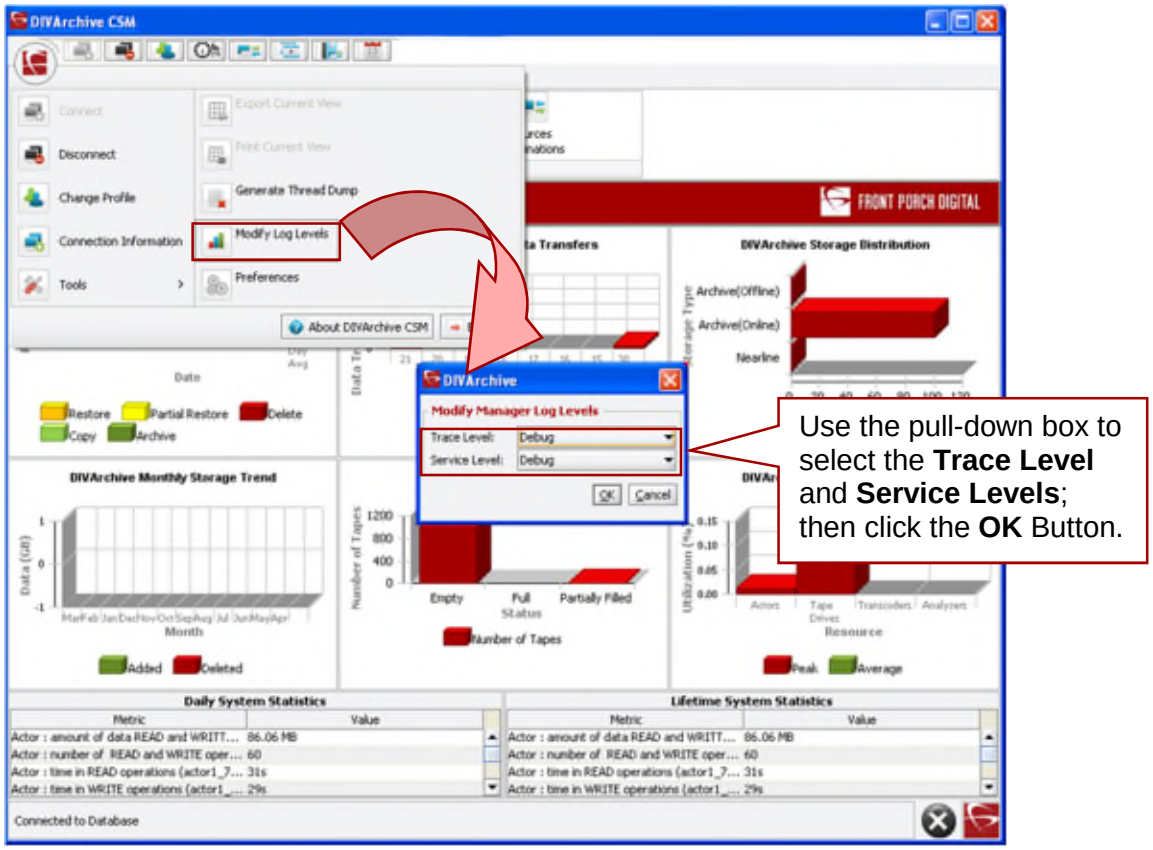
Figure 110: Control GUI Preferences – Fonts Tab



6.5 Manager Log Level Configuration

The Manager's log level is now configurable via the Control GUI. If a greater level of detail is required to examine the Manager's activity, it is now possible to change the log level without restarting the Manager. To change the log level, click on **Tools** then **Modify Log Levels** and set the **Trace Level** and **Service Level** to the desired setting.

Figure 111: Control GUI - Setting Manager Log Levels



6.6 Control GUI Tabs and Views

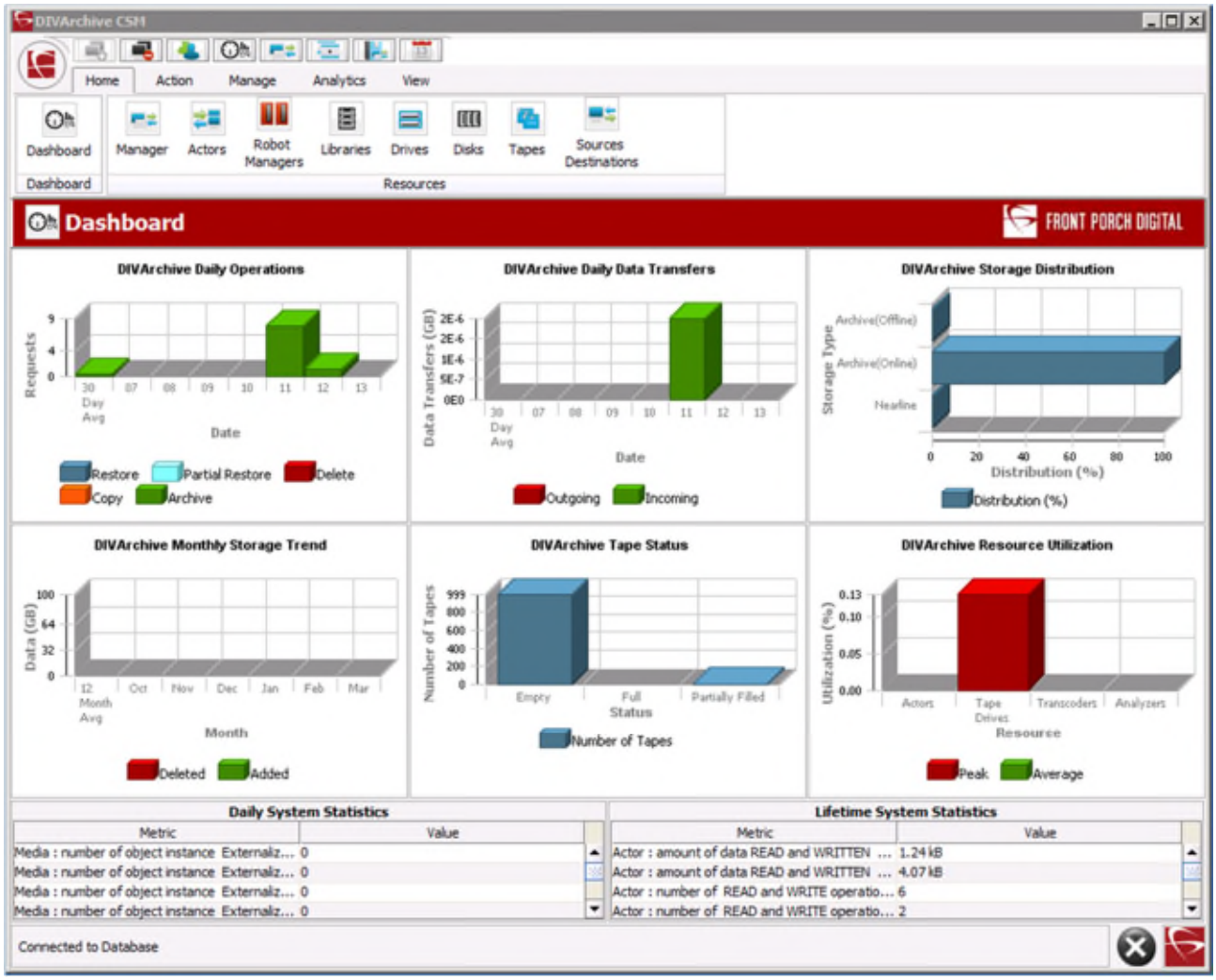
6.6.1 Dashboard

The DIVArchive Control GUI has a look and feel resembling other types of Windows-based applications. The Control GUI Dashboard readily displays information at a glance as soon as the application is started.

The DIVArchive Dashboard presents statistics representing system data in the form of bar graphs and below the graphs daily and lifetime statistics is shown. By default the following graphs will be displayed.

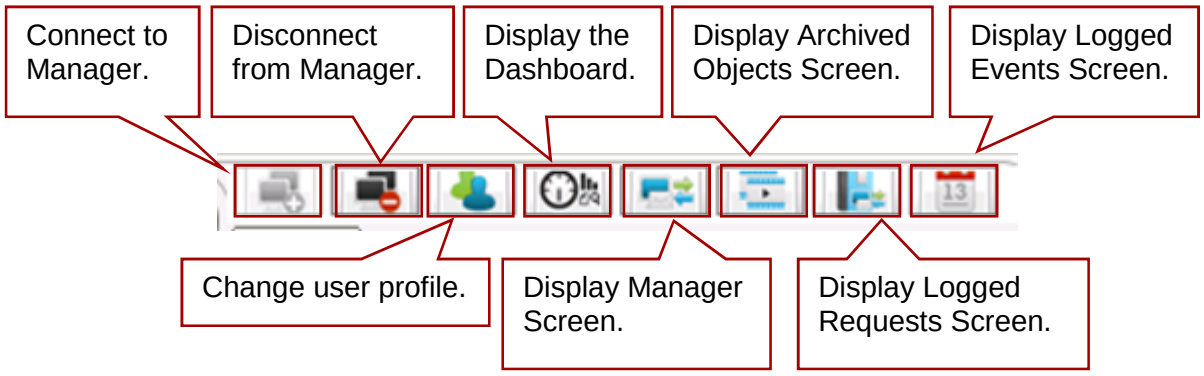
- **Daily Operations** – represents a seven day window of Restore, Partial File Restore, Delete, Copy, and Archive operations performed, and a thirty day average of operations.
- **Daily Data Transfers** – represents a seven day window of Outgoing and Incoming DIVArchive data movement; a thirty day average is displayed.
- **Storage Distribution** – represents data storage distribution to Disk Arrays (*Nearline*), Tapes (*Online*) in an ACS that is online, Tapes (*Offline*) in an ACS that is offline, and tapes on shelf.
- **Monthly Storage Trend** – Monthly Data (*in Gigabytes*) Archive and Deleted. The 12 Month Average reflects data movement in the past twelve months. Activity in the current month is used for the twelve month average calculation.
- **Tapes Status** – Reflects the total number of online tapes managed by DIVArchive that are empty, partially used, and totally full.
- **Resource Utilization** – reflects DIVArchive resource utilization of Actors, Tape Drives, and Transcoders.

Figure 112: Control GUI Dashboard



Quick Launch Buttons are located at the top of the Control GUI:

Figure 113: Control GUI Quick Buttons



6.6.2 Toolbars and Navigation

Toolbars and navigation use Windows-Style navigation utilizing a Ribbon Bar and Tabs:

Figure 114: Control GUI Home Tab

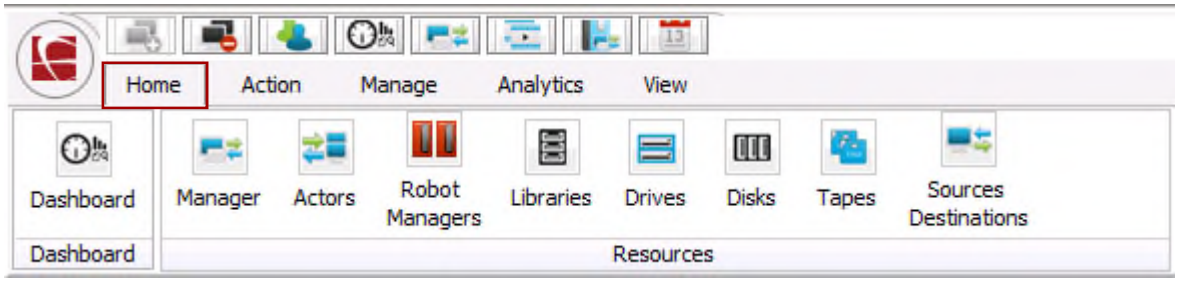


Figure 115: Control GUI Action Tab

Figure 116: Control GUI Manage Tab

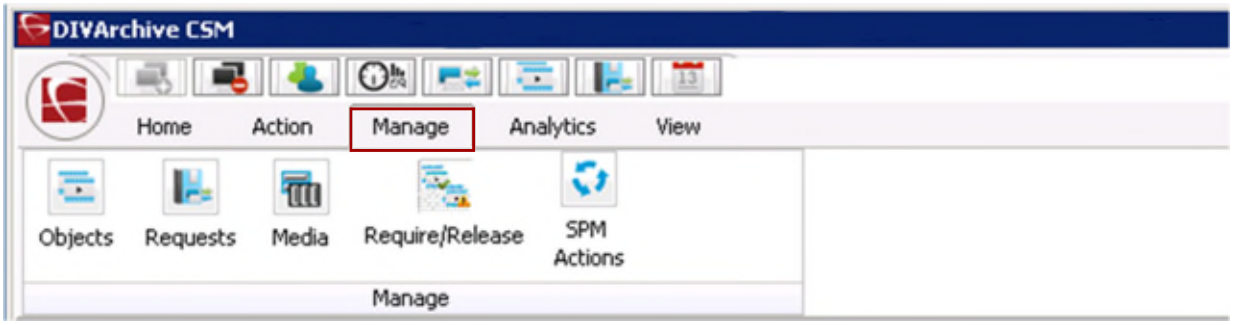


Figure 117: Control GUI Analytics Tab

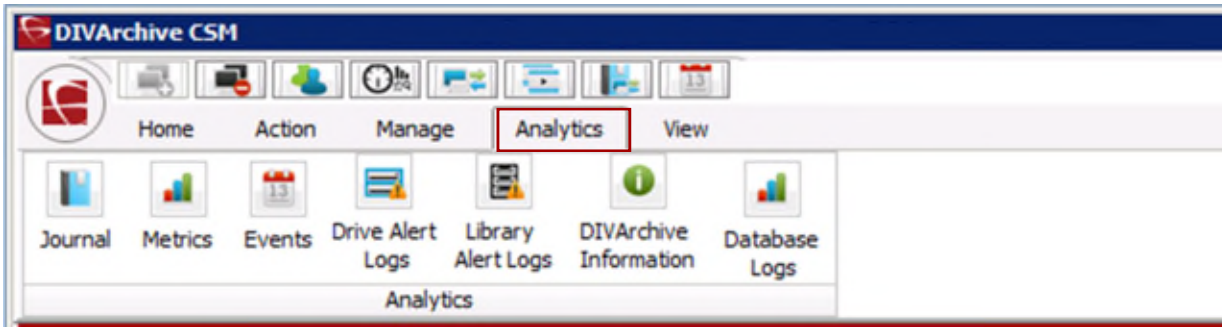
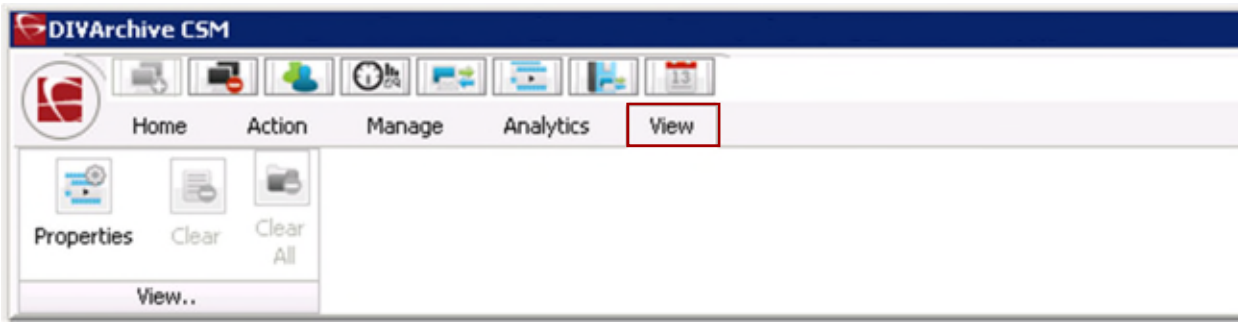


Figure 118: Control GUI View Tab



A new Windows-Style Menu has been added to the Control GUI providing various functions as shown in the following figures:

Figure 119: Control GUI Menu – Connect

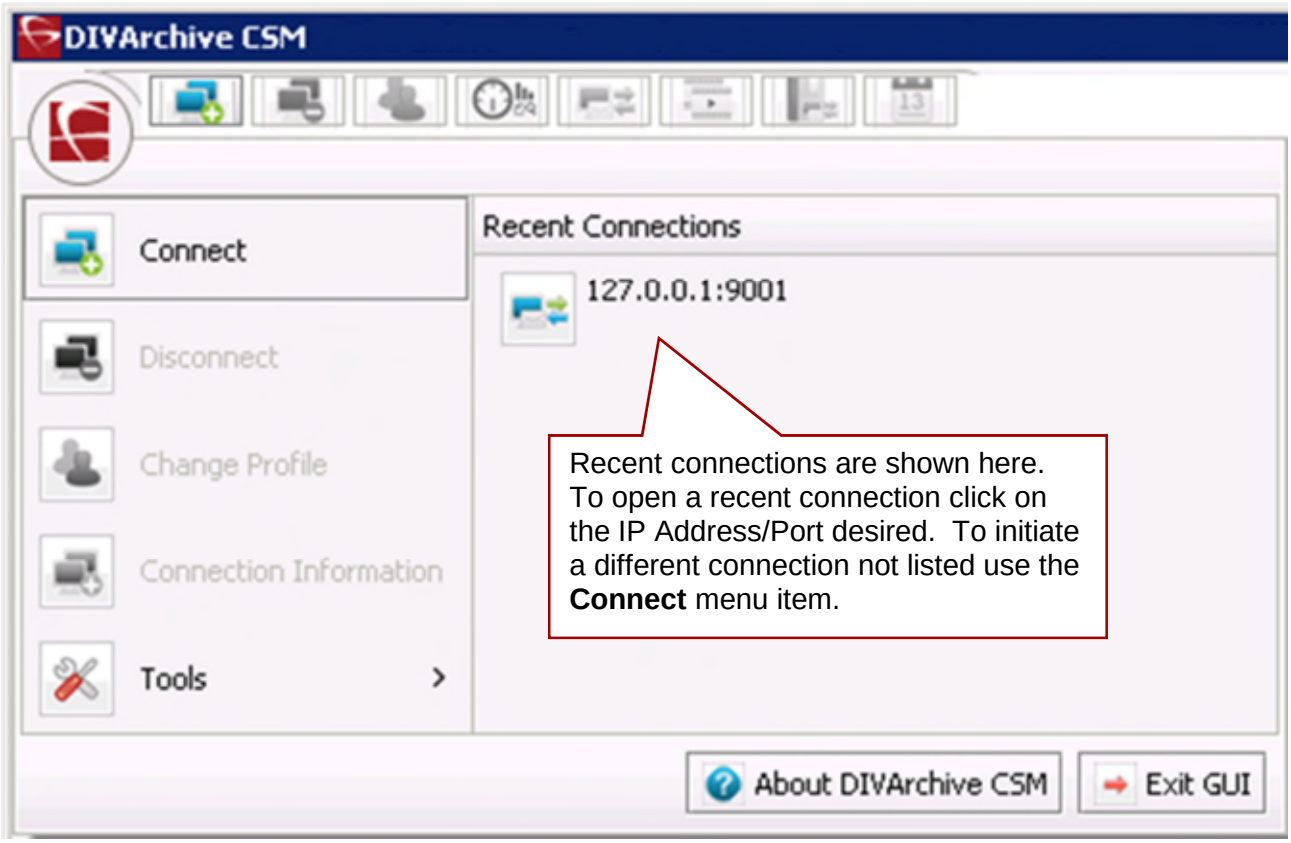


Figure 120: Control GUI Menu – Disconnect

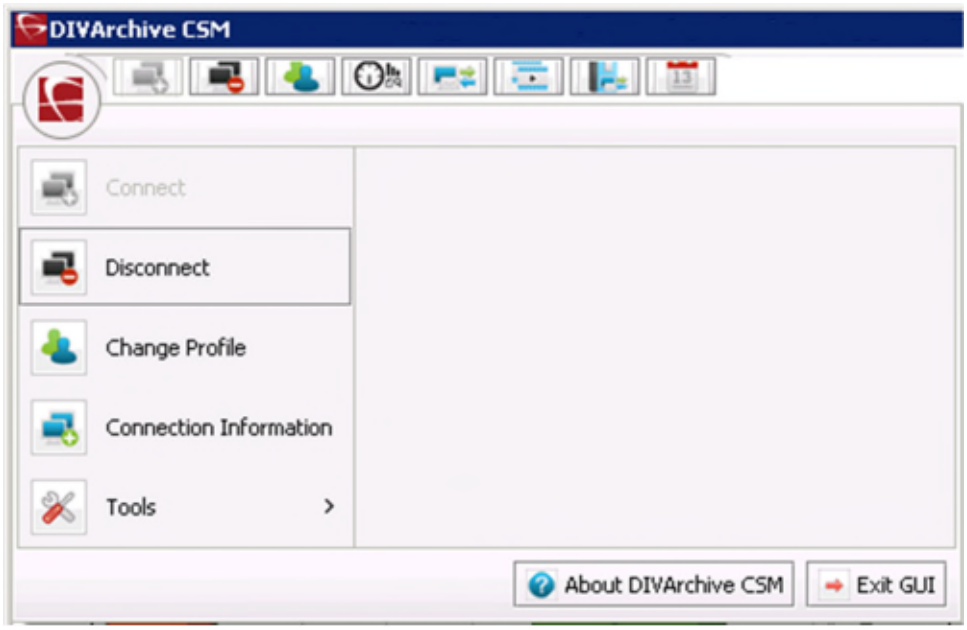


Figure 121: Control GUI Menu – Change User Profile

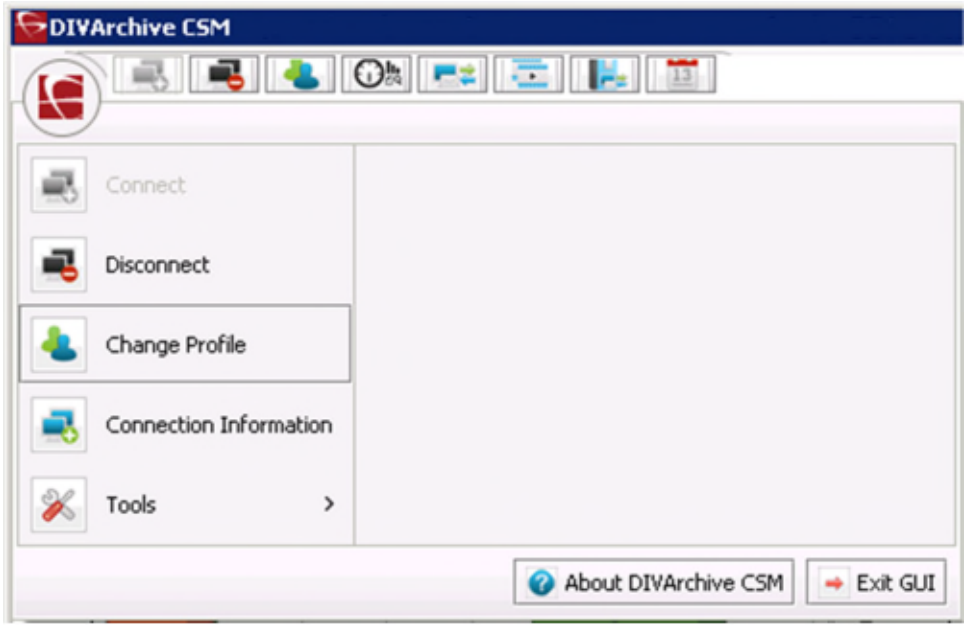
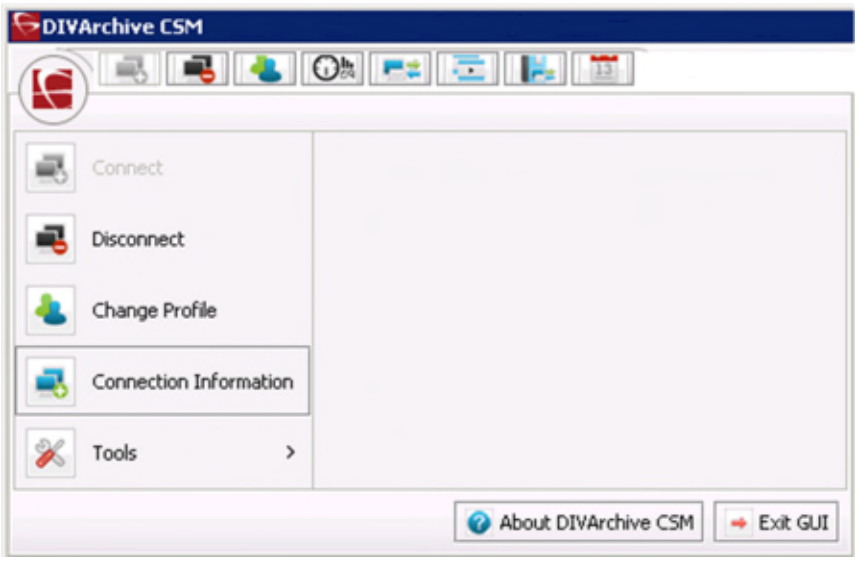


Figure 122: Control GUI Menu – Connection Information



Clicking on the Connection Information Menu Item displays the Connection Information Dialog shown in the figure below.

Figure 123: Connection Information Dialog Box

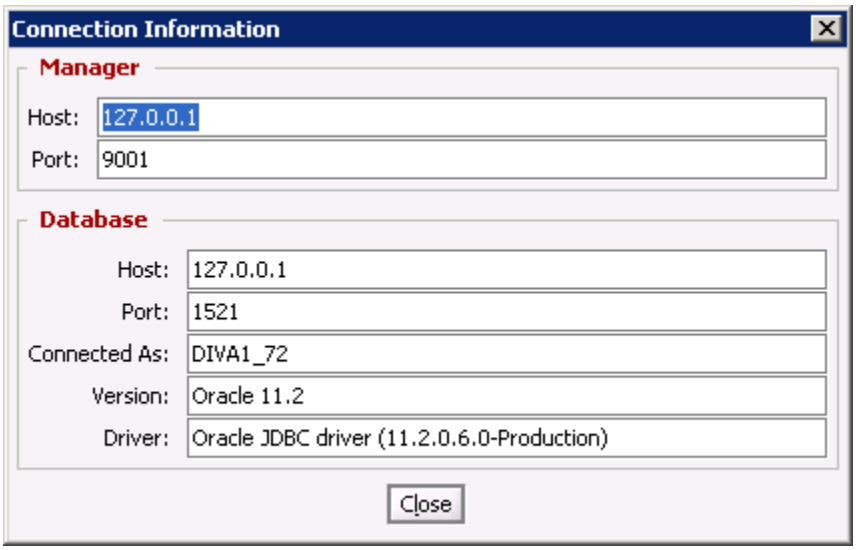
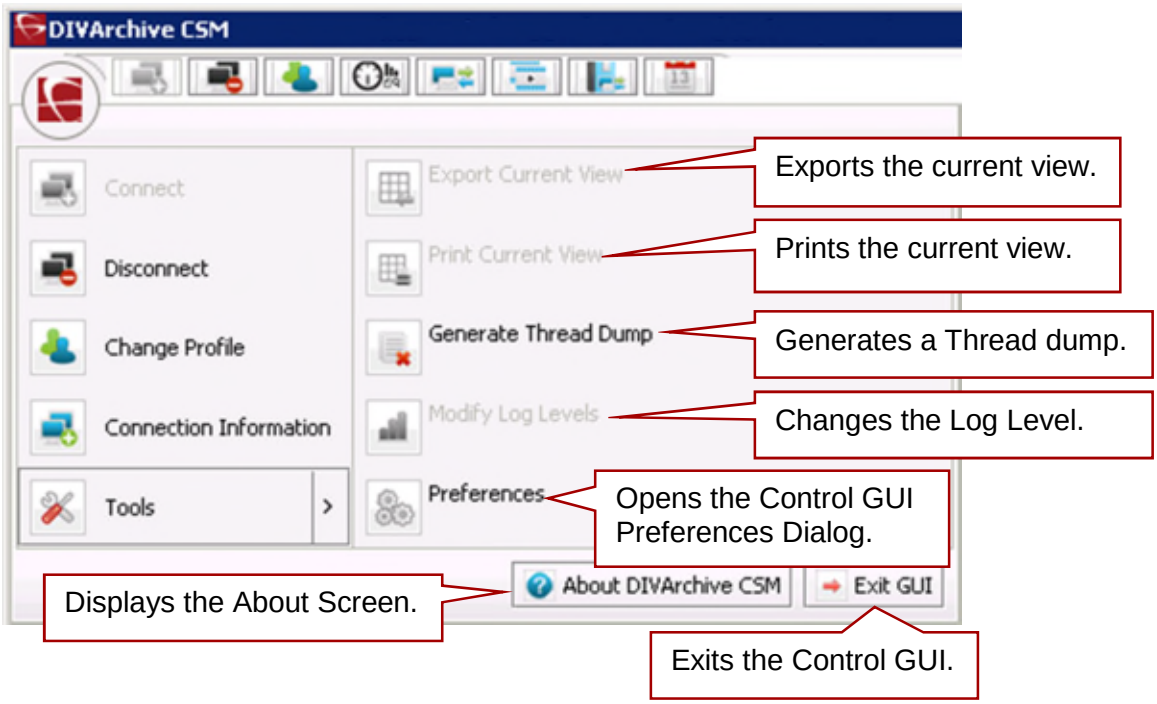


Figure 124: Control GUI Menu – Tools



6.6.3 Home Tab: Manager (Current Requests View)

The **Current Requests View** primarily displays the current requests that have been submitted to DIVArchive that are currently in, or pending, execution. Requests that have been completed, aborted, or encountered warnings during execution are also displayed. This feature only applies when the Control GUI is connected to DIVArchive; completed or aborted requests prior to the connection are not displayed. The number of pending, executing, completed, and aborted requests displayed while connected depends on the Control GUI preferences.

Figure 125: Control GUI Manager View

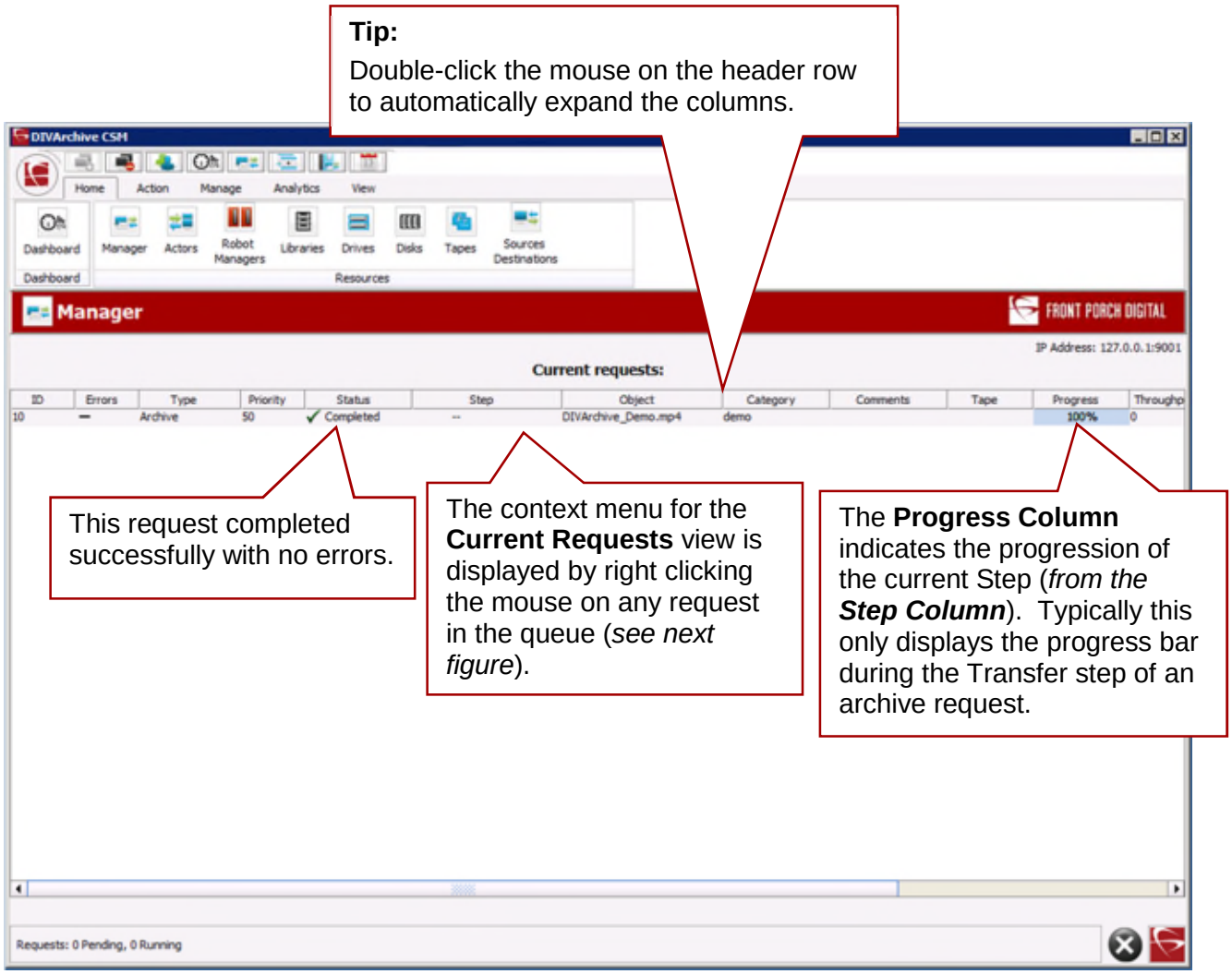


Figure 126: Manager View Context Menu

Properties Display the selected request's *Event Log* and other detailed properties. This performs the same action as double clicking the request directly.

Clear Removes the selected completed or cancelled request from the *Current Requests* queue.

Cancel The selected request is cancelled.

Change Priority Raise or lower the selected request's priority in the *Current Requests* queue.

Retry Enables a completed (or failed) request to be resubmitted to DIVArchive. The retried request can be edited prior to resubmission.

6.6.3.1 Column Definitions

Table 36: Control GUI Manager View Column Definitions

Column Name	Description
ID	This number is automatically assigned by DIVArchive. Every submitted request and its **Events List** are stored in the DIVArchive Database. A request that has been cleared from the **Current Requests View** can be later retrieved in the **Requests View**.
Errors	This indicates whether the request encountered a warning (*non-fatal; orange exclamation mark*), or an error (*fatal; red exclamation mark*). Warning messages, although not fatal, may indicate an ongoing problem with a DIVArchive system component or related sub-system and should still be investigated.
Type	This is the function of the request. Refer to Section 2.13 for the DIVArchive request types.
Priority	The **Request Priority** is considered by DIVArchive for a request's event execution (*refer to Section 6.6.3.6 for more information*).
Status	This describes the execution status of the request. • **Pending:** The request is queued for execution. • **Running:** The request is proceeding normally. • **Aborted:** The request failed due to a fatal error. Double click the request or select **Properties** from the context menu to examine the running log for that request. If desired, aborted requests can be retried or cleared from the **Current Requests View**. • **Partially Aborted:** For N-Restore requests. Some transfers were successful however an error was encountered on at least one destination. Retrying the failed request will again restore to all destinations even if they were previously successful. • **Completed:** The request completed successfully. If desired, completed requests can be cleared from the **Current Requests View**. • **Cancelled:** The request was cancelled by a user. If desired, cancelled requests can be cleared from the **Current Requests View**.
Step	The current operation (*step*) of the request; getting object size, transferring, etc. Each step is updated to the requests **Event Log**. **Contact your Oracle Support Specialist for more information on steps and operation processing.**
Object	Name of the DIVArchive object specified in the request. If the request is for a tape repack, this field indicates the object being read or written to tape.

Column Name	Description
Category	Category of the DIVArchive object specified in the request. If the request is for a tape repack, this field indicates the Object Category being read or written to tape.
Comments	Any comments that were entered to be associated with the object.
Third Party ID (*only valid for Restore and Partial File Restore*)	The number assigned to a request by a Third Party Application. This column shows the data entered in the **Options** field of **Restore** and **Partial File Restore** Requests. The column will be empty for other request types.
Instance	If a DIVArchive object exists as multiple instances, this column indicates the specific instance involved with the request. If no instance was specified in the request, no value will be displayed, although the specific instance in use will be recorded in the request's event log. If an error is encountered with the transfer of an instance, DIVArchive will automatically retry the request with the other instances (*if available*). If the transfer is then successful, a warning symbol (*orange exclamation mark*) is displayed in the **Errors** column for that request.
Tape	If a request involves a transfer to or from a tape, this column denotes the barcode label of the tape currently in use for that operation (*or step*).
Progress	Percentage of transfer to/from archive currently completed. This may not function as expected when archiving from certain sources that do not return a file size to DIVArchive prior to the file being transferred.
Throughput	The average transfer speed of the request.

6.6.3.2 Request Steps

The **Step** column indicates the current operation of the request being performed by DIVArchive. A short description of each step is as follows.

Table 37: Control GUI Steps Colum Definitions

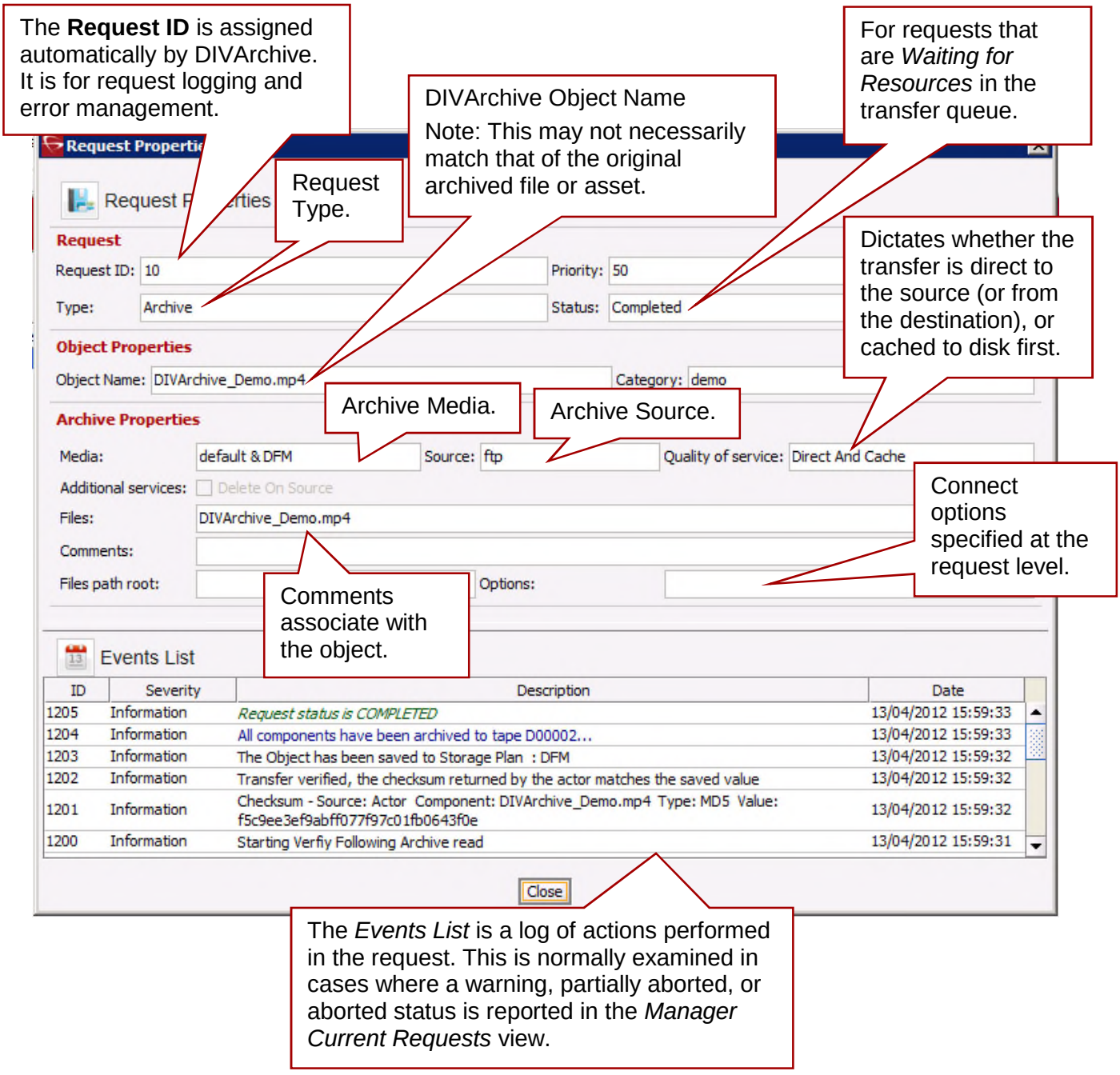
Step	Description
Mounting	A tape is being inserted to a drive. The mounting step is completed once the tape is fully threaded, positioned at the tape header, and the DIVArchive label on tape verified with that of the barcode label. If the label does not match, the request will be aborted, and the tape will be set to **Not Writable**. This situation could occur if there is a mismatch in the DIVArchive **Actor/Drives** configuration, or the tape has already been used in another archive system (*and therefore has a tape label not useable by DIVArchive*). The latter example is a protection feature in shared library environments, where the tape has not been set to Set ID 99 (*i.e. not in use by DIVArchive*). Tapes from other archive systems must first have their tape label cleared prior to using them in DIVArchive. Contact Oracle Technical Support for assistance if you need to use such tapes.
Dismounting	This step involves ejecting a tape from a drive. A DIVArchive Actor first issues an **Eject** command to the drive (*in which it rewinds, unthreads and ejects the tape*), and the DIVArchive Robot Manager issues a dismount command to the library to return it to a tape bin. If the drive is unable to complete the request, the request is aborted and the drive set to **Out of Order**.
Positioning	When reading from tape, the tape is being positioned to the selected object. When writing to tape, the tape is being positioned to the **End of Data** (*i.e. to the position where the last object was written*). If this process takes too long, DIVArchive will time out the operation and attempt to dismount the tape. If this also fails, the drive will be set to **Out of Order**.
Reading	The DIVArchive object displayed in the **Object** column is being read from tape. If this step takes too long (*e.g. the drive is in a hung state*), DIVArchive will timeout the step and attempt to use another drive (*or instance if available*).
Writing	The DIVArchive object displayed in the **Object** column is being written to tape. If this step takes too long, (*e.g. the drive is in a hung state*), DIVArchive will attempt to write the object on another tape in another drive.

Step	Description
Deleting	This step is rewriting the tape's label and moving the End of Data pointer therein prior to writing to the tape in an archive operation. This will be seen on a tape which has previously been used by DIVArchive but has since had all objects deleted and consequently returned to the **Unused Tapes Sets**.
Transferring	Data is either being transferred to a source from an Actor cache or from a destination to the Actor cache.
Waiting for Operator	This step holds the request in a suspended state and is waiting for human intervention, such as inserting tapes in library's **Cartridge Access Port** (*CAP*).
Waiting for Resources	DIVArchive resources required for this request are currently in use by another request and the request will be executed when they become available. Resource availability can also be influenced by the Request Priority of other requests much lower in the queue. DIVArchive incorporates an intelligent feature (*which must be enabled in the DIVArchive configuration*) whereby requests with a lower request priority will be *boosted* over higher priority requests if they involve a tape that is already mounted from a previous request. This feature can substantially reduce the amount of tape mounting and dismounting, and speed up the executions of all requests overall.

6.6.3.3 Viewing a Request's Properties

Select the request to view by placing the mouse cursor over it and right-clicking the mouse to bring up the options menu and selecting **Properties**. The Properties Window (*shown below*) may also be initiated by double-clicking the request.

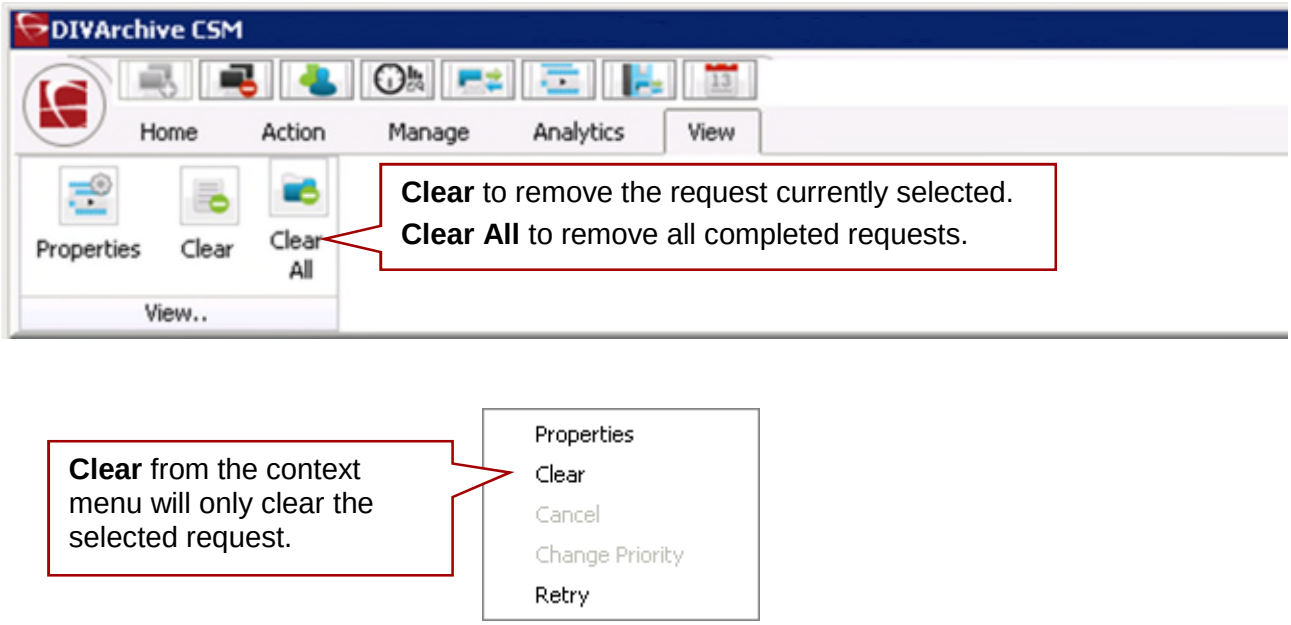
Figure 127: Control GUI Request Properties Window



6.6.3.4 Clearing Completed Requests

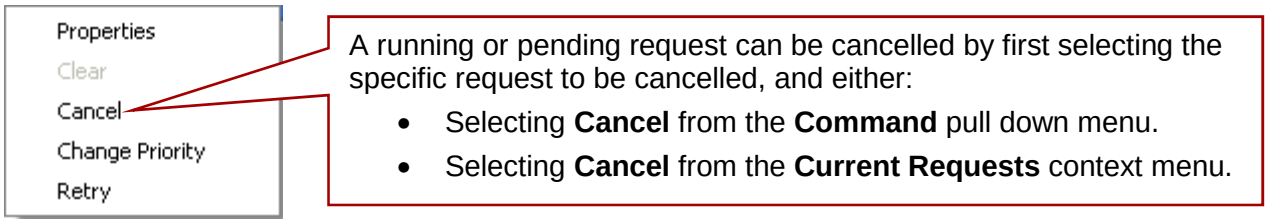
Completed, Aborted, Partially Aborted or Cancelled requests can be cleared from the **Current Requests Queue** with the **Clear** or **Clear All** commands. This can be achieved either through the **View Tab** or the **Current Requests** context menus.

Figure 128: Clearing Completed Requests from the Control GUI Manager View



6.6.3.5 Cancelling a Request

Figure 129: Cancelling a Request



Note: The current operation (*or step*) on a request that is currently being executed may need to complete before the request is actually cancelled by DIVArchive.

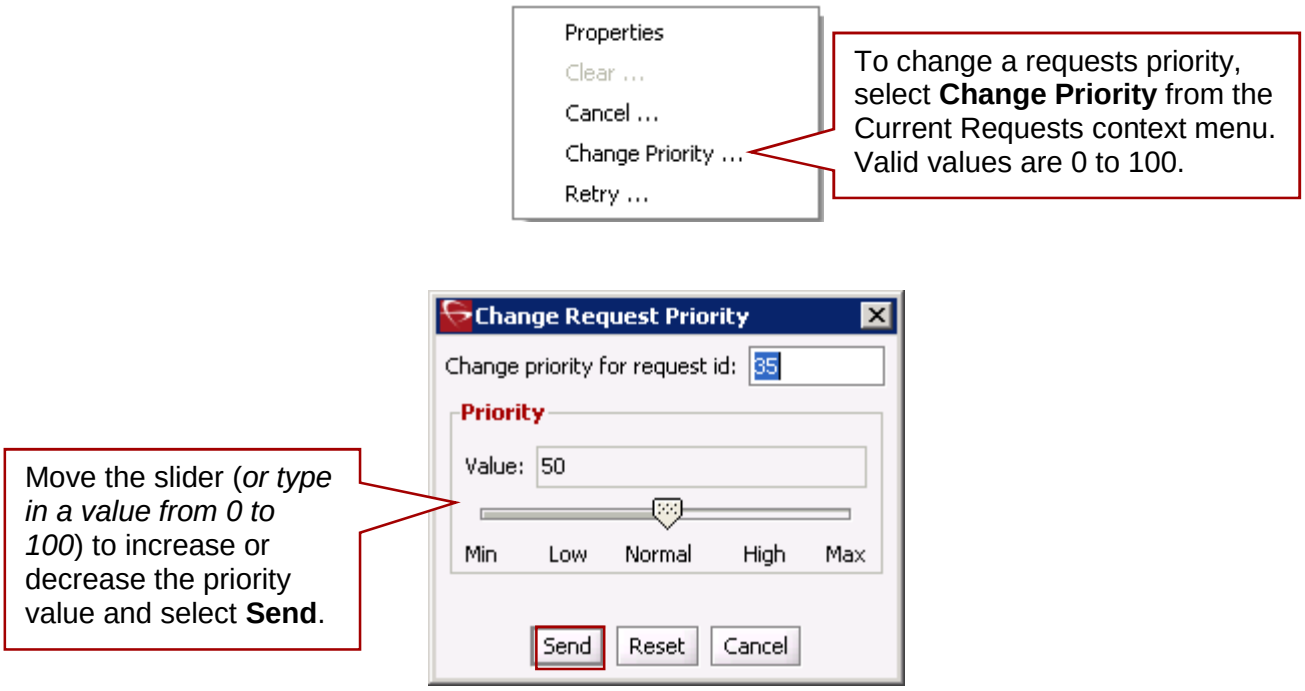
6.6.3.6 Changing the Priority of a Request

If there are a number of pending requests in the **Current Requests Queue**, DIVArchive will process each request based on its request priority.

If you need a specific request to execute before (*or after*) the requests that precede it in the queue, you can manually adjust that request's priority to be higher (*or lower*) than that of the preceding requests. It should also be pointed out that the raising (*or lowering*) of a request's priority can also be achieved through the DIVArchive Client API using a 3rd party archive initiator.

Raising a pending request's priority does not stop, or pause, any request(s) that are currently executing; it simply changes the order in which the pending request will be processed by DIVArchive. The exception is if a resource that is being used by a running request (*such as a specific tape*) becomes available after that running request has completed an operation. The order of request execution may also be influenced if the **`DIVARCHIVE_PRIORITY_TIER`** setting in the DIVArchive configuration is enabled (*i.e. a request lower in the queue will have this value added to its request priority if it involves a tape already mounted*).

Figure 130: Changing the Request Priority in the Control GUI



By default, DIVArchive will periodically increment the request priority of all requests in the queue. This prevents low priority requests (*such as Copy to Group*) from continually being overridden by higher priority requests and getting stuck indefinitely in the queue.

6.6.3.7 Retrying a Request

A previously completed or failed request can be resubmitted to DIVArchive with the **Retry** command. This is useful for re-submitting similar requests where few of the details change between them. For a request that was aborted (*e.g. because a parameter was incorrectly entered, or a Source/Destination was briefly offline*), the failed request can be retried without having to submit a completely new request.

Figure 131: Retrying a Request in the Control GUI

6.6.4 Home Tab: Actors (Actors View)

The **Actors View** provides an indication of the status of each Actor defined in the Configuration Utility and any currently running requests. Selecting one of the Actors with the mouse will display the currently running request on that Actor in the window below it. This view is displayed by selecting **Actors** in the **Home Tab**.

Figure 132: Viewing the Actor Statuses in the Control GUI

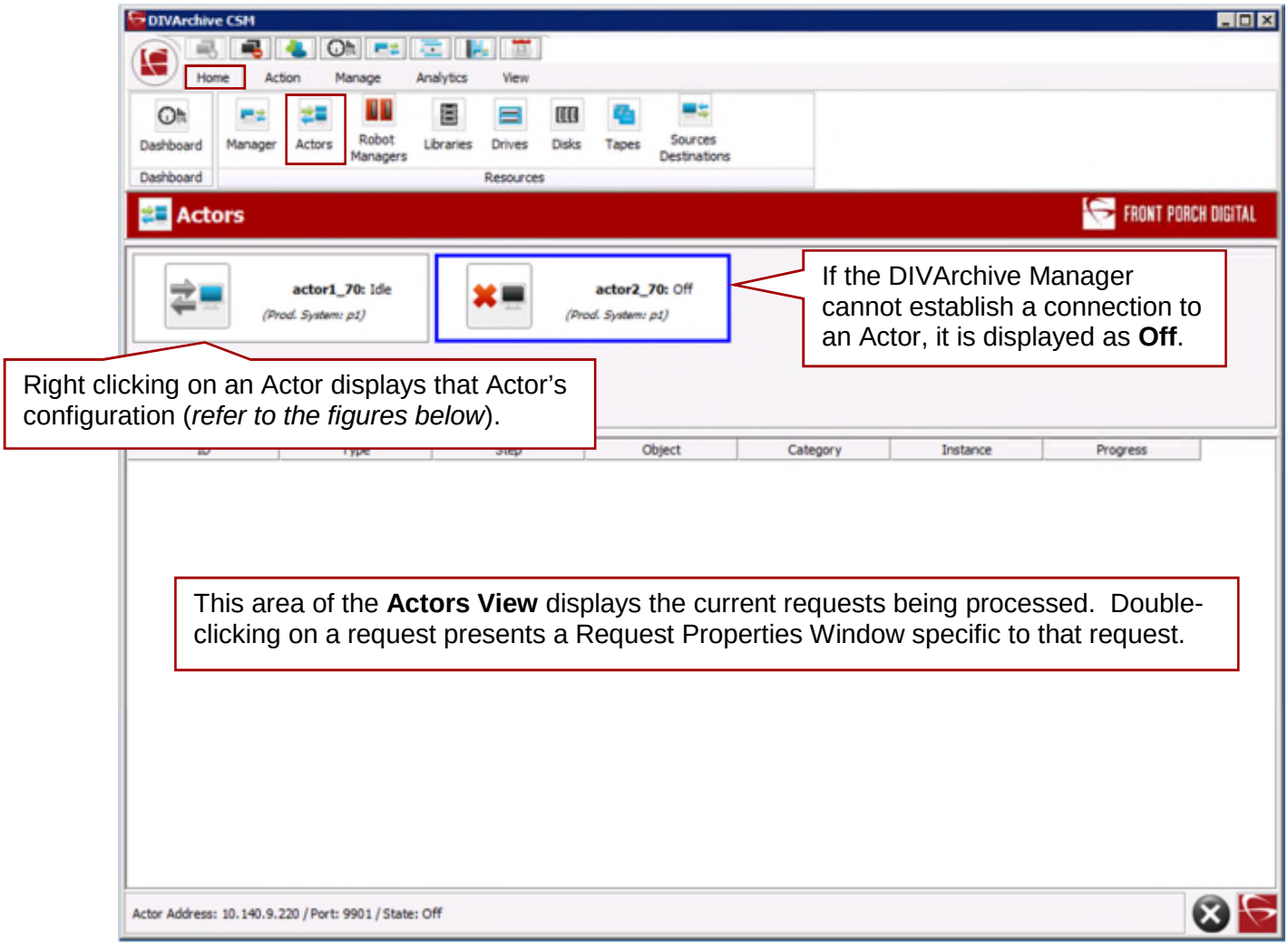


Figure 133: Control GUI Actors View Properties – Properties Window

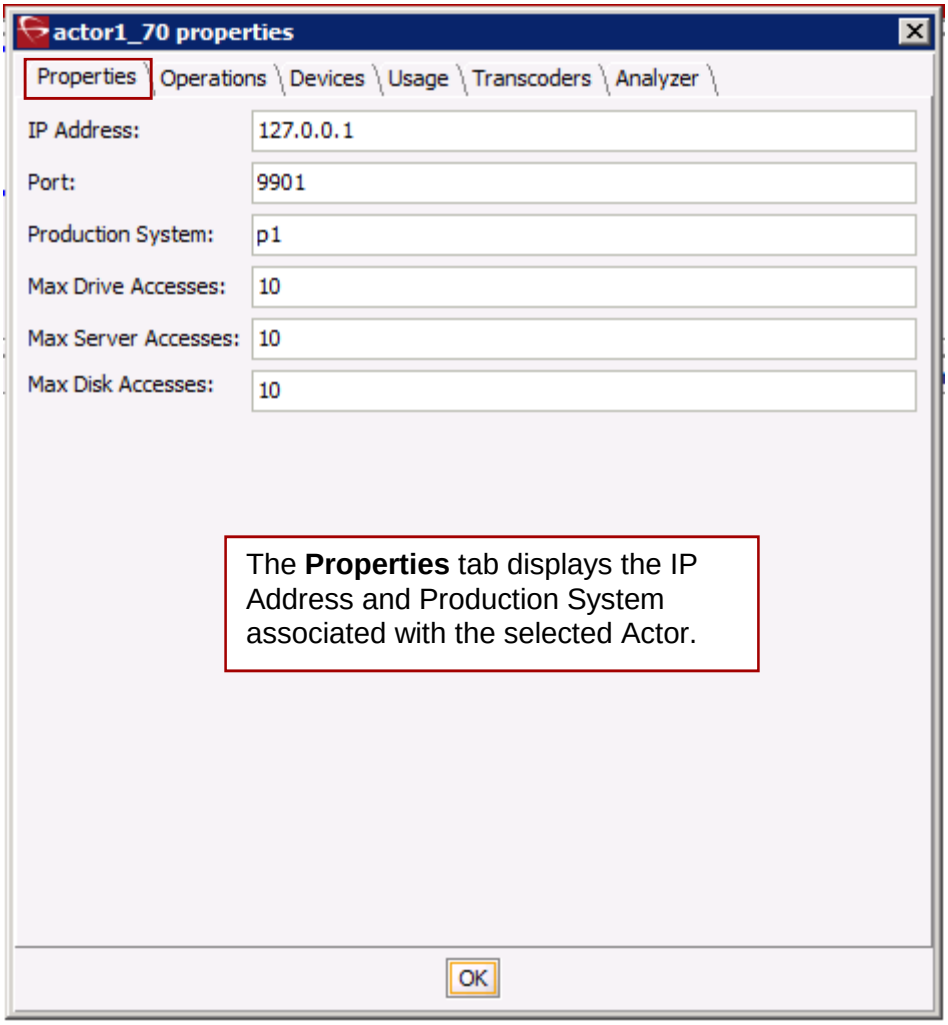


Figure 134: Control GUI Actors View Properties – Operations Window

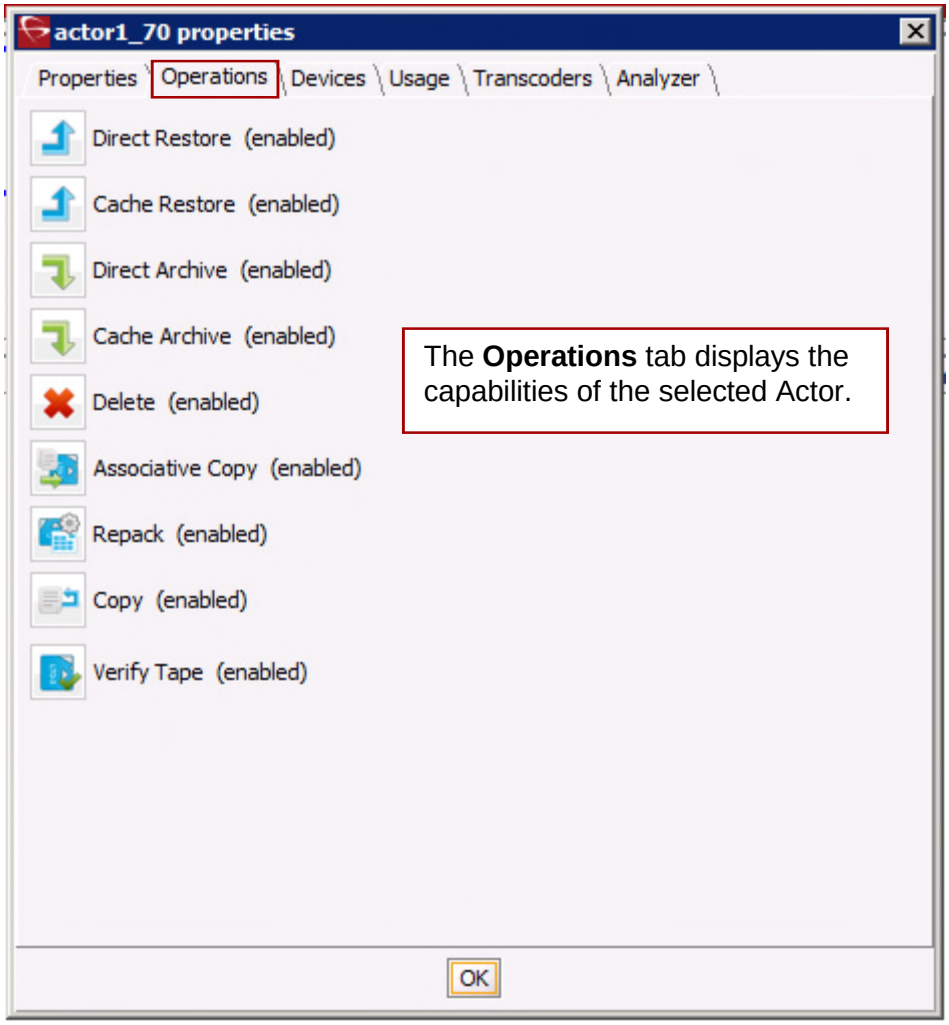


Figure 135: Control GUI Actors View Properties – Devices Window

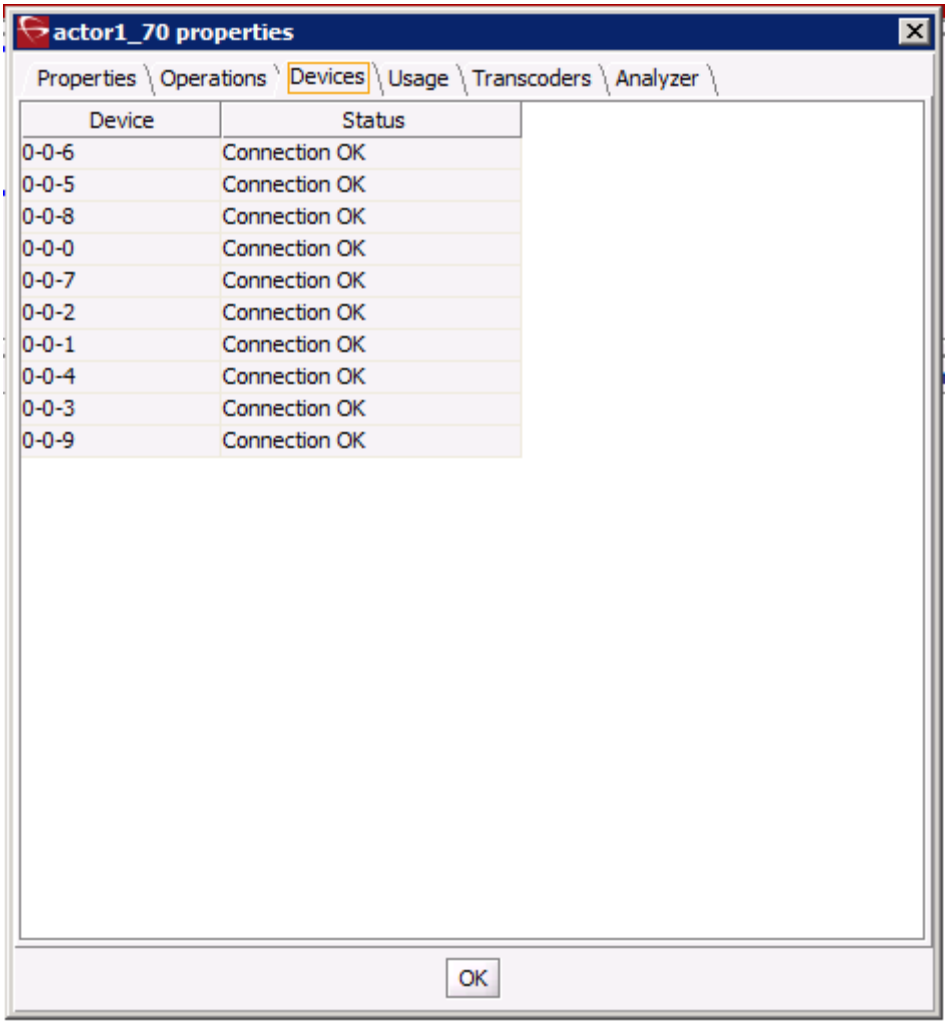


Figure 136: Control GUI Actors View Properties – Usage Window

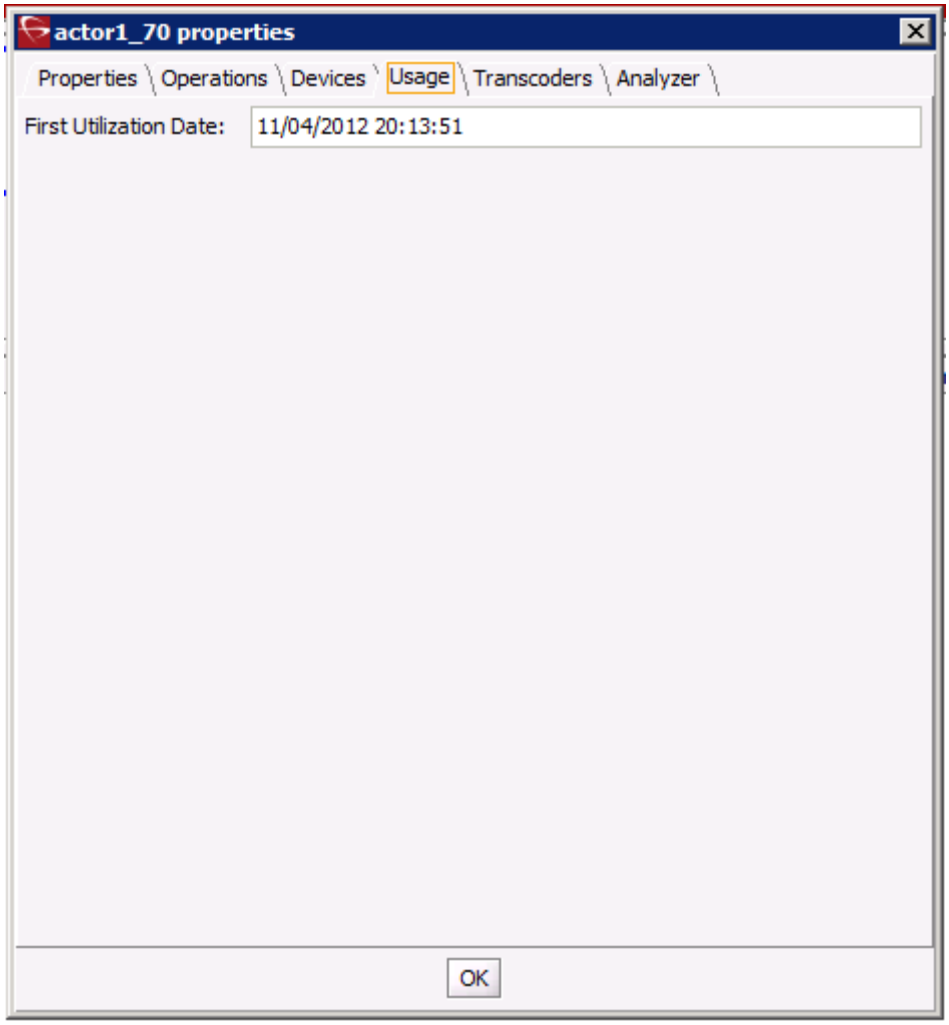


Figure 137: Control GUI Actors View Properties – Transcoders Window

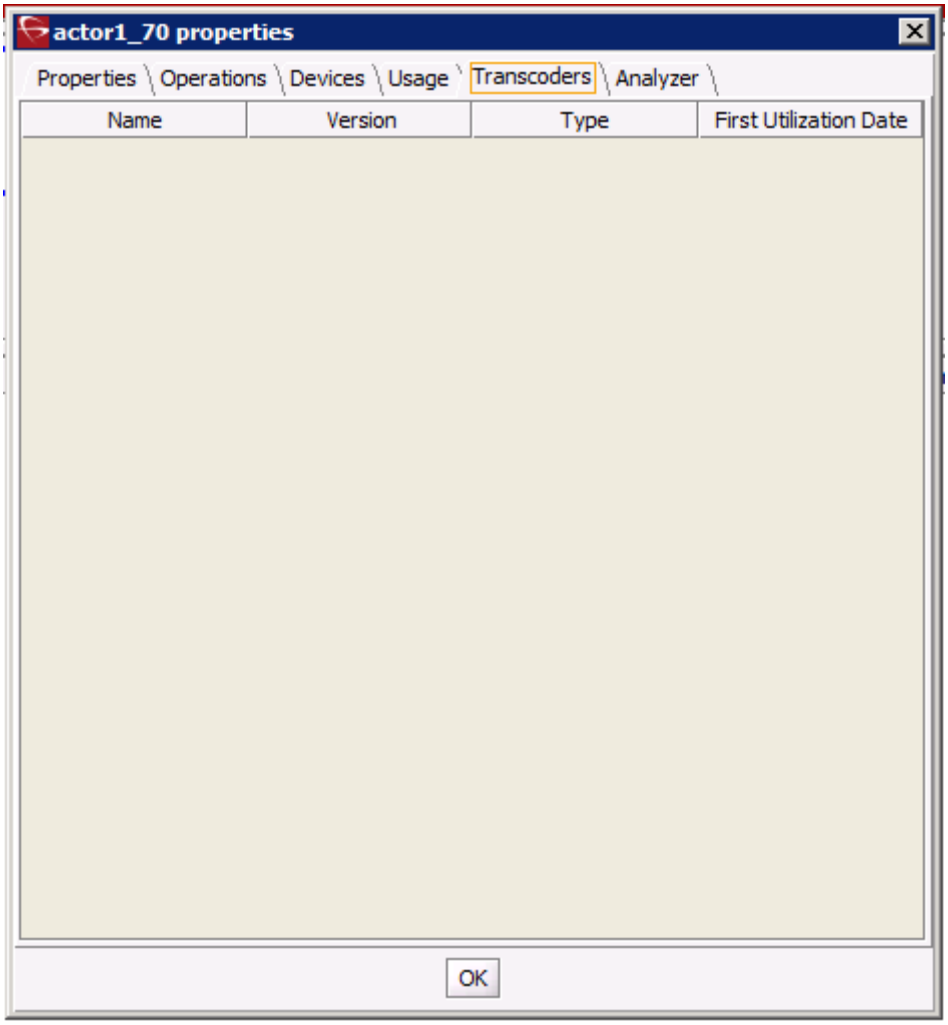
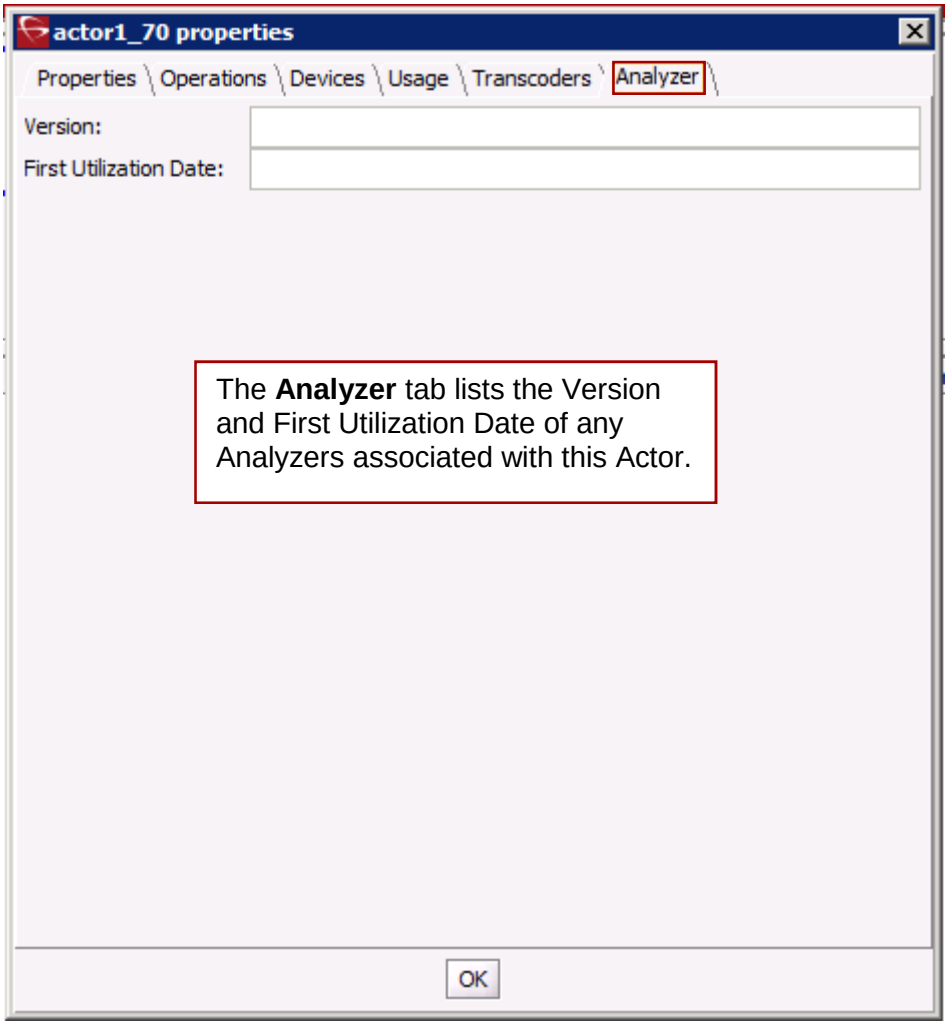


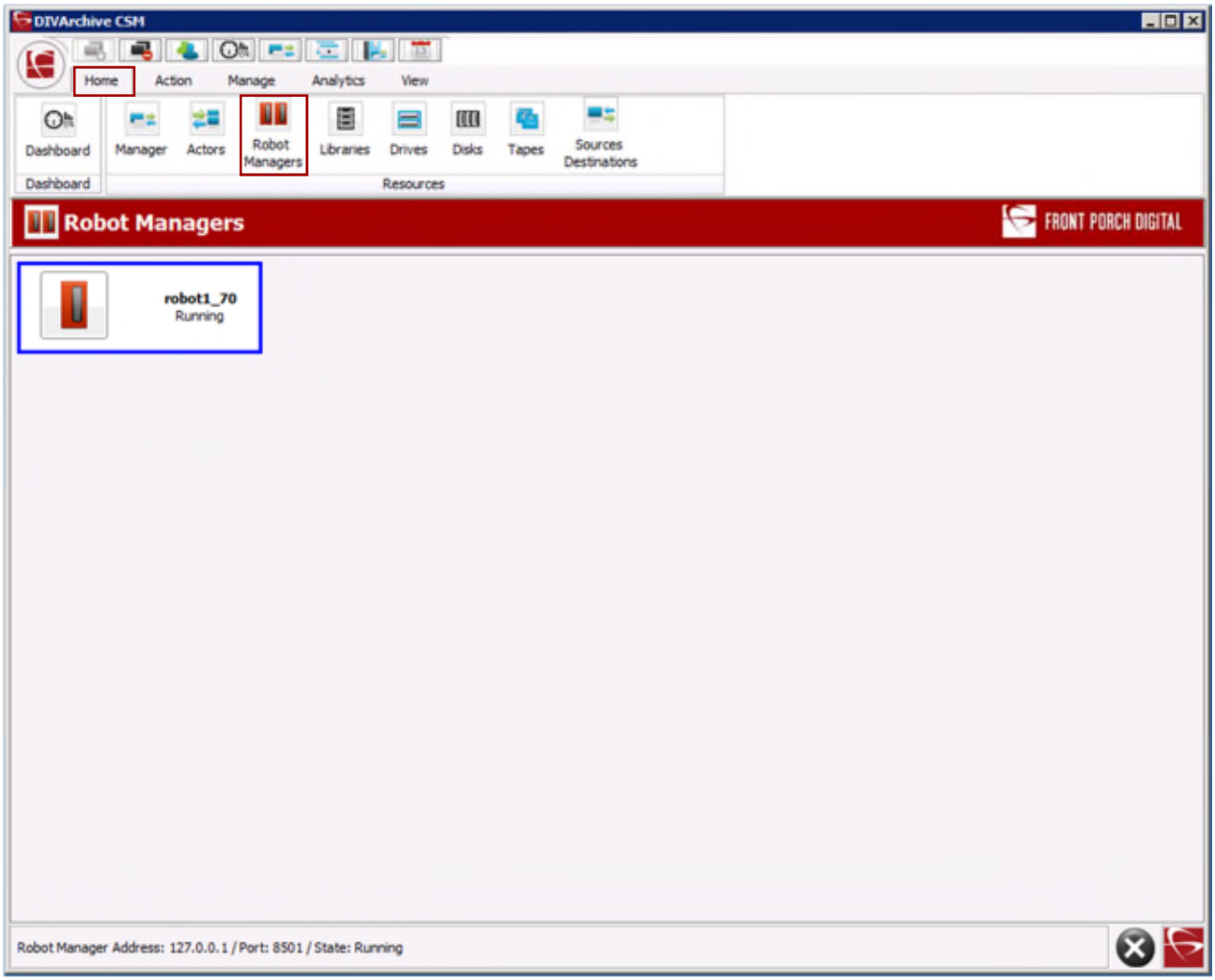
Figure 138: Control GUI Actors View Properties – Analyzer Window



6.6.5 Home Tab: Robot Managers

The **Robot Managers Button** on the **Home Tab** displays the Robots identified in the DIVArchive System.

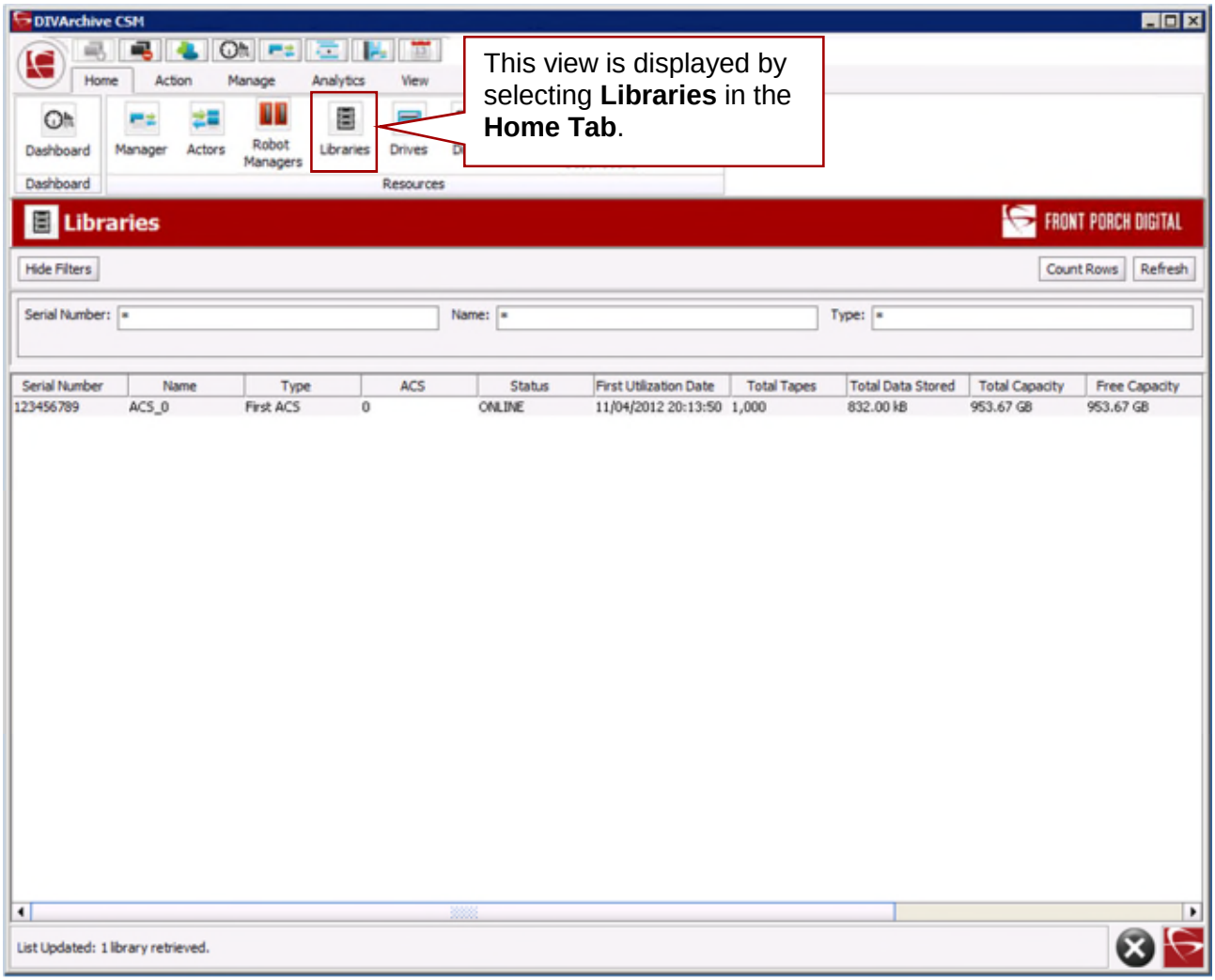
Figure 139: Home Tab – Robot Managers Button



6.6.6 Home Tab: Libraries (Libraries View)

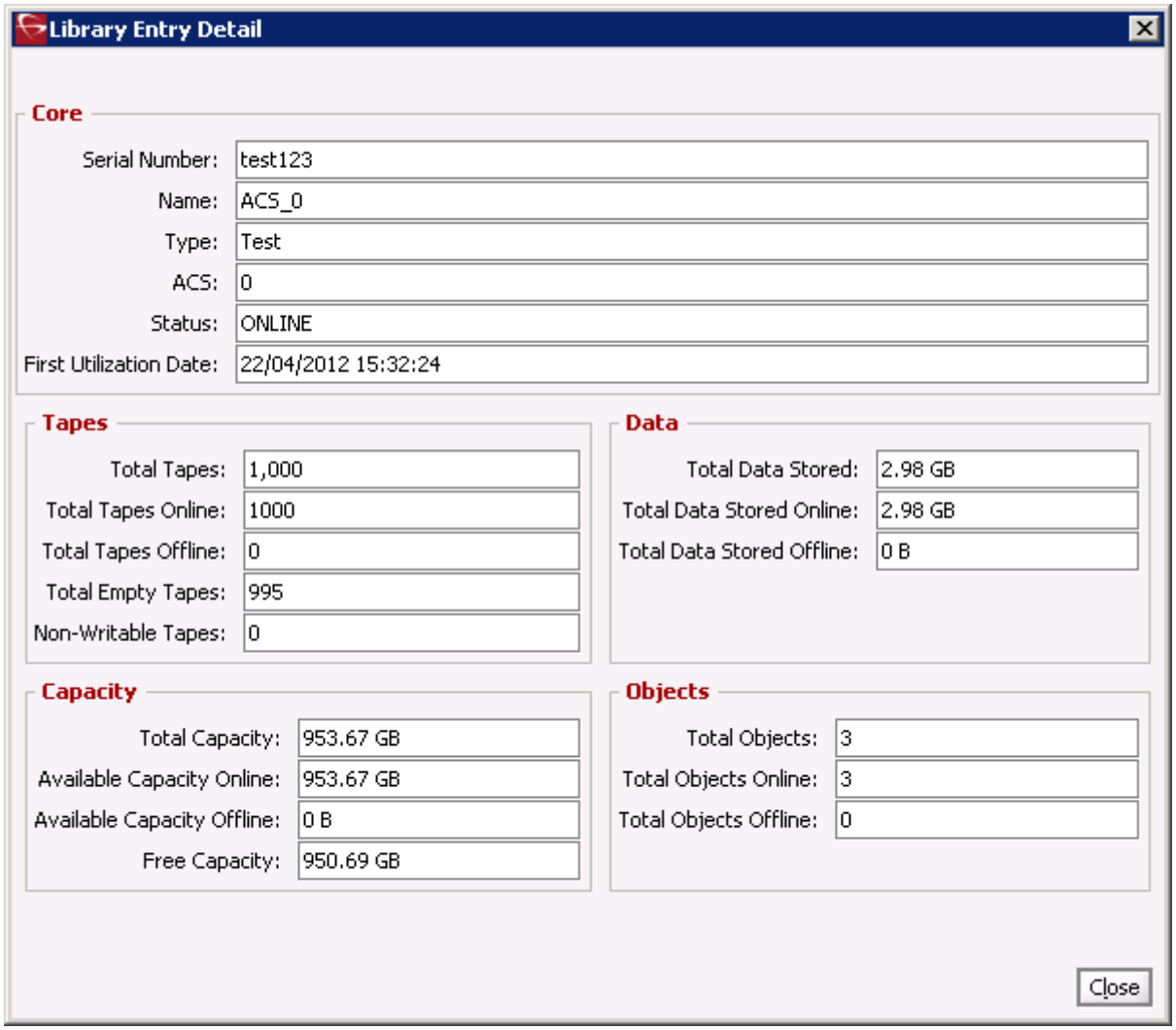
The **Libraries View** gives the information and an indication of the status of each of the libraries connected to DIVArchive.

Figure 140: Control GUI – Libraries View



Double-click the library for Library Entry Detail. This view offers information concerning the specified library as shown:

Figure 141: Control GUI – Libraries View – Library Entry Detail Window

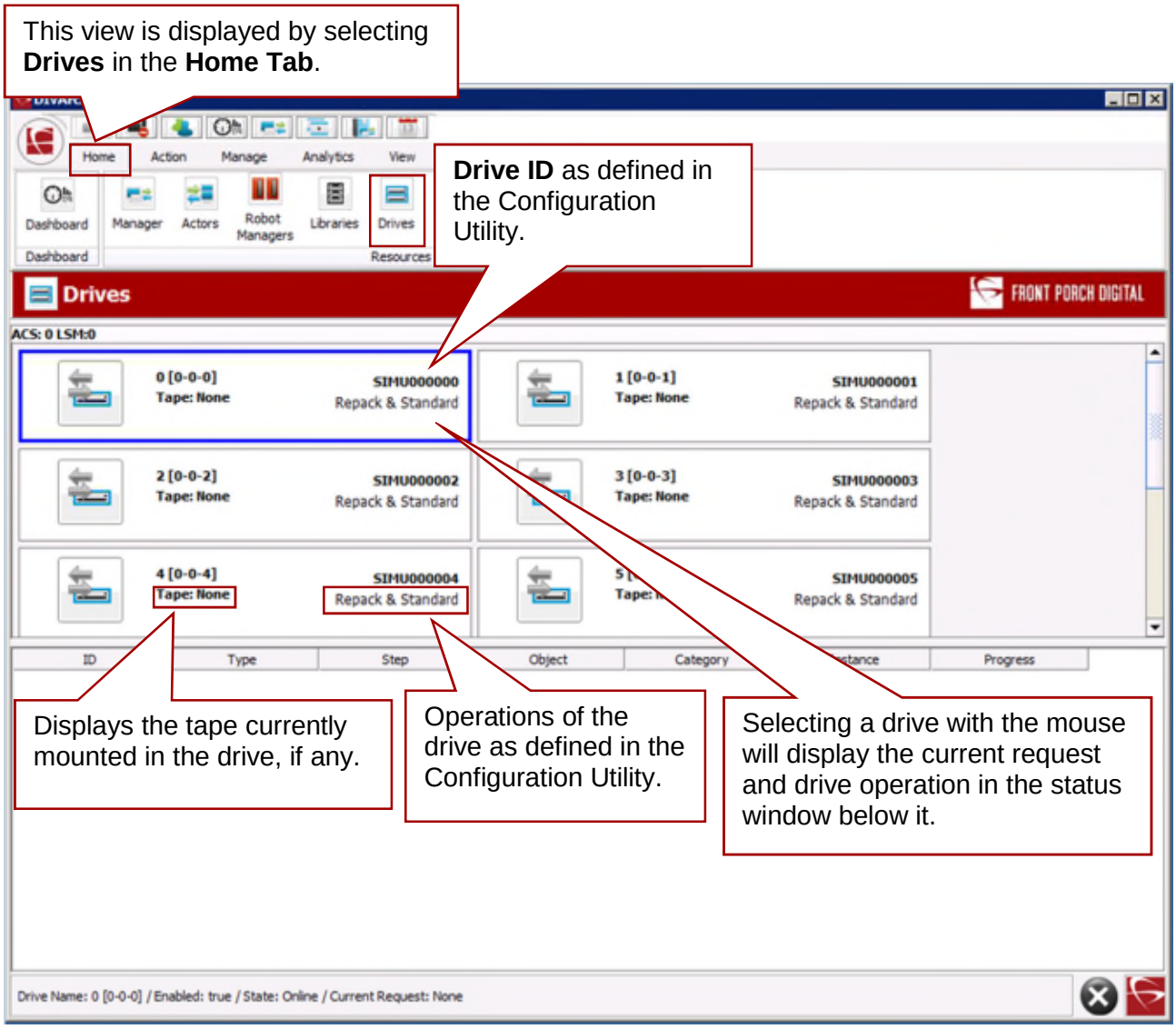


6.6.7 Home Tab: Drives (Drives View)

The **Drives View** gives an indication of the status of each tape drive in the libraries connected to DIVArchive, and what (*if any*) tape is mounted in each drive. Online or offline status for a drive is configured in the **Drives** frame of the **Drives Tab** in the Configuration Utility.

If DIVArchive encounters a problem with a particular drive, DIVArchive will set the drive to **Out of Order** as a safety measure. When a drive is set to this state, it will not be used for DIVArchive operations.

Figure 142: Control GUI – Drives View



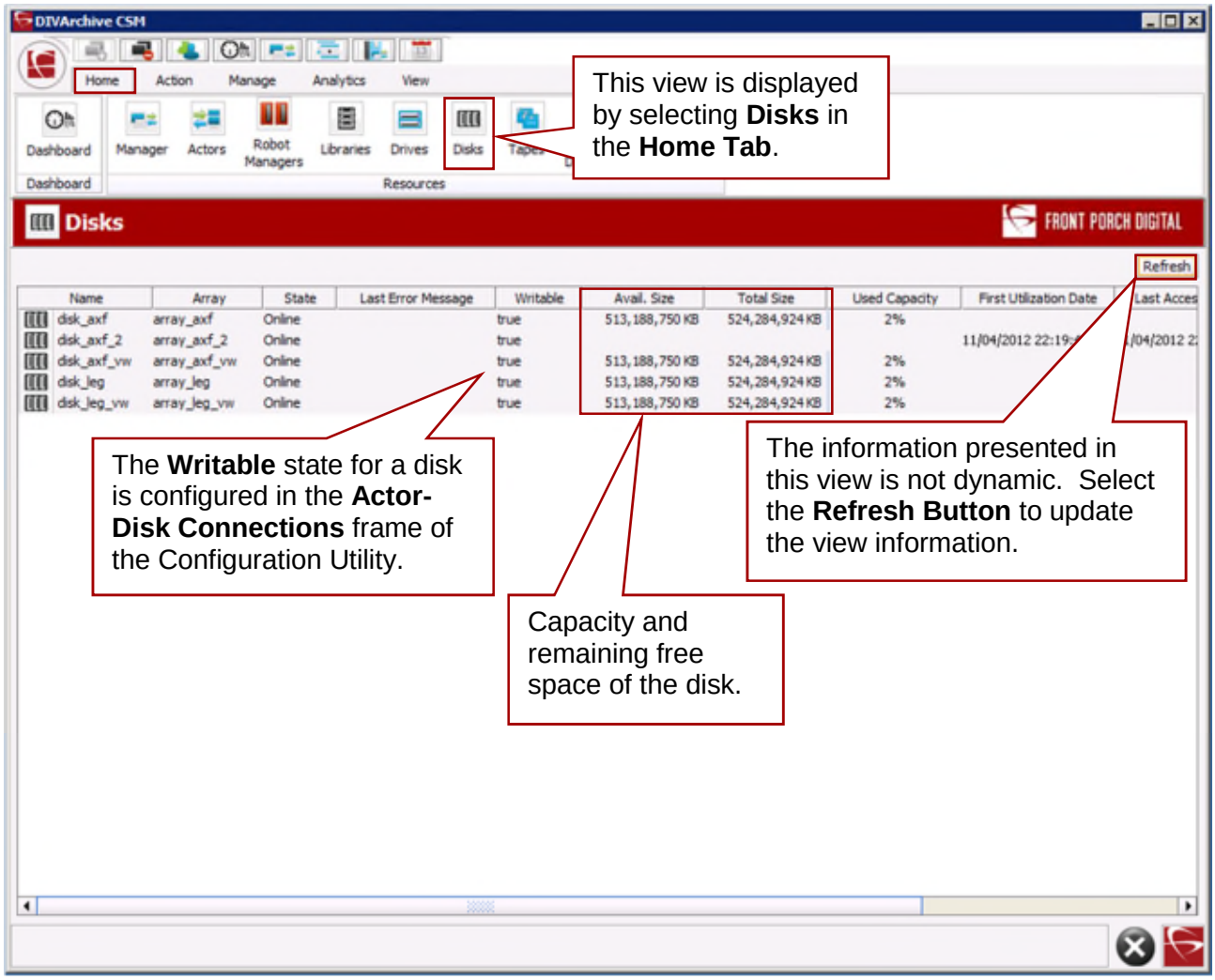
Note: If a drive has been set to Out of Order, the cause of the error needs to be investigated before setting the drive back to Working Well in the Configuration Utility.

6.6.8 Home Tab: Disks (Disks View)

The **Disks View** indicates the online status and capacities of disks configured in DIVArchive. The status of a disk can be set through the **Disks** frame of the Configuration Utility. If DIVArchive has automatically set a disk to **Out of Order**, the cause of the error should be investigated before setting the disk back to **Working Well**.

If DIVArchive encounters an I/O error with the disk, it is set to **Out of Order** (*offline*) automatically by DIVArchive.

Figure 143: Control GUI Disks View



6.6.9 Home Tab: Tapes View

The **Tapes View** provides flexible search criteria to execute DIVArchive Database queries about the tapes that are managed by DIVArchive. Search queries can be executed independently whether the DIVArchive Manager is running or not. However, the Control GUI must be connected to the DIVArchive Database.

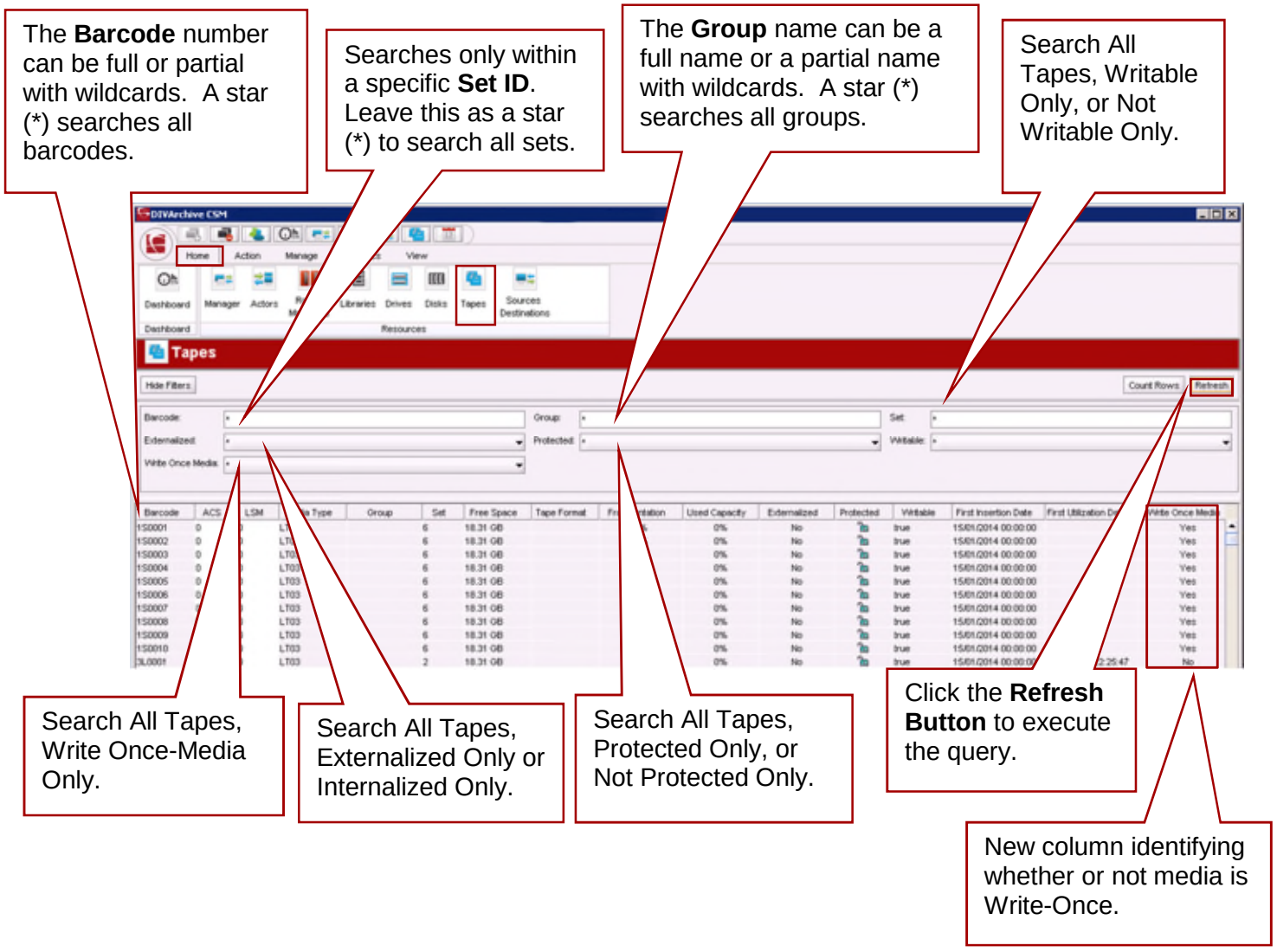
With the introduction of the Sony Optical Drives, the user can view whether or not a media is Write-Once by clicking on the tape (*the Write-Once property is displayed in the Tape Properties Window*). The Blu-ray Discs are shown as tapes and viewable in the **Tapes View Panel** of the Control GUI. A new column has been added to display this information as either **Y** (*Yes*) or **N** (*No*) indicating whether or not the tape is Write-Once. The user may also filter the view so only Write-Once Media is displayed.

The tape database search criteria allows for:

- Searching by a specific Set ID
  - If you have a number of Set ID's using the same media, this type of search quickly establishes if you need to reassign additional tapes to that set.
- Determining what tapes are currently externalized from your DIVArchive managed libraries.
- Searching what tapes are assigned to specific groups.
  - This allows you to reduce the number of results and minimize the database query time when a great number of tapes and groups are currently managed by DIVArchive.
- Determining what tapes are not writable.
  - A tape is typically set to **Not Writable** when DIVArchive encounters an unexpected error with that tape. If a large number of tapes are being reported as Not Writable, this may indicate an ongoing problem with a tape drive and should be investigated.
- Quickly identifying any tapes set to **Protected Mode** (*This can also be done in the Configuration Utility*).
  - If a tape has been externalized from a library, DIVArchive assumes that no more material is intended to be written to it and sets it to Protected Mode. If it is reinserted in the library, this state prevents any further material from being written to it.
- Establishing what tapes should be repacked (*manually*) based on their fragmentation percentage and used capacity statistics.

This view is displayed by selecting **Tapes** in the **Home Tab**. You must at least be connected to the DIVArchive Database to access this view.

Figure 144: Control GUI – Tapes View



6.6.9.1 Tapes Column Definitions

Table 38: Tapes Column Definitions

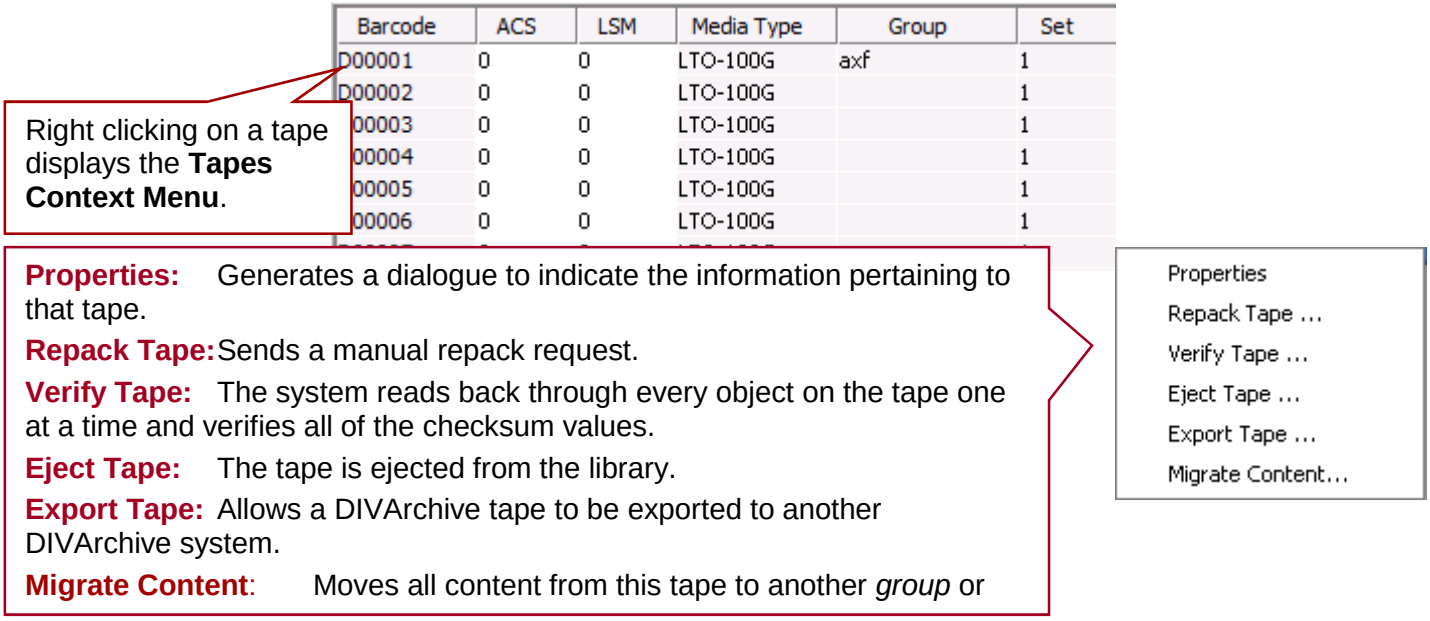
Column Name	Description
Barcode	The barcode label of the tape.
ACS, LSM	If DIVArchive is managing more than a single library, this represents the library where the tape is inserted.
Media Type	Media type of the tape. These values will correspond to those defined in the **Tape Properties** frame of the Configuration Utility.
Group	If no DIVArchive objects have been written to a tape, the Group Name for the tape will be empty. When a DIVArchive object is first written to the tape it will be assigned to the group specified in the archive request.

Column Name	Description
Set	The Set ID the tape is currently assigned to. Tapes are assigned to Set ID's in the **Unused Tapes Sets** frame in the Configuration Utility (*refer to Section 5.3.5.2*).
Free Space	The remaining free space available on the tape for object storage based on the position of the last DIVArchive object on tape. The free space value will **not** decrease as objects are deleted from the tape (*see Fragmentation below*).
Tape Format	This column displays the format of the tape; *AXF* or *Legacy*.
Fragmentation	If an object is deleted from a tape (*and DIVArchive objects still exist on that tape*), the space from the deleted object is not available for storage until the tape is repacked, migrated, or cleared of all DIVArchive objects. The fragmentation percentage gives an overall indication of the unusable space on the tape relative to the Used Capacity.
Used Capacity	The total percentage of space (*archived objects and previously deleted objects*) used on the tape.
Externalized	If this is displayed as **Yes** it indicates the tape has been removed from the associated library. A tape can also be set to Externalized by DIVArchive if it was not reported during an audit of the library tapes during a database synchronization initiated in the Configuration Utility.
Protected	If a tape has been externalized from a library, DIVArchive assumes that no more media is intended to be written to it and sets it to Protected Mode. If it is reinserted in the library, this state prevents any further material from being written to it. This state can be removed in the **Inserted Protected Tapes** frame of the Configuration Utility.
Writable	Indicates whether the tape can be written to or not. If false, generally indicates that DIVArchive experienced an unexpected problem with this tape.
First Insertion Date	The date of the first time the Tape was inserted into the DIVArchive System.
First Utilization Date	The date of the first time the Tape was used in the DIVArchive System.

6.6.9.2 Tapes Context Menu

Right-clicking on a specific tape in the Tapes View will produce a pop-up menu offering operations to be performed on the selected tape.

Figure 145: Control GUI – Tapes View Context Menu



6.6.9.3 Tape Properties

The **Tape Properties** dialogue is for informational purposes only. No data within the tape can be directly manipulated by the operator from this dialogue.

Figure 146: Selecting Properties from the Tapes View Context Menu

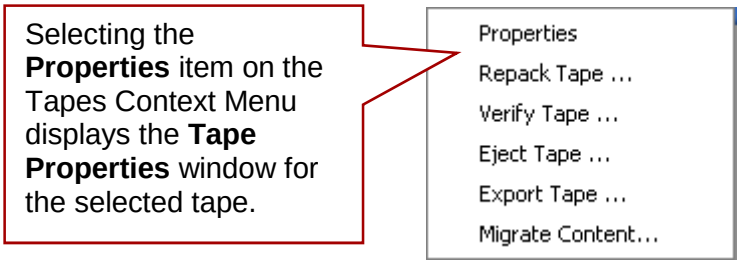
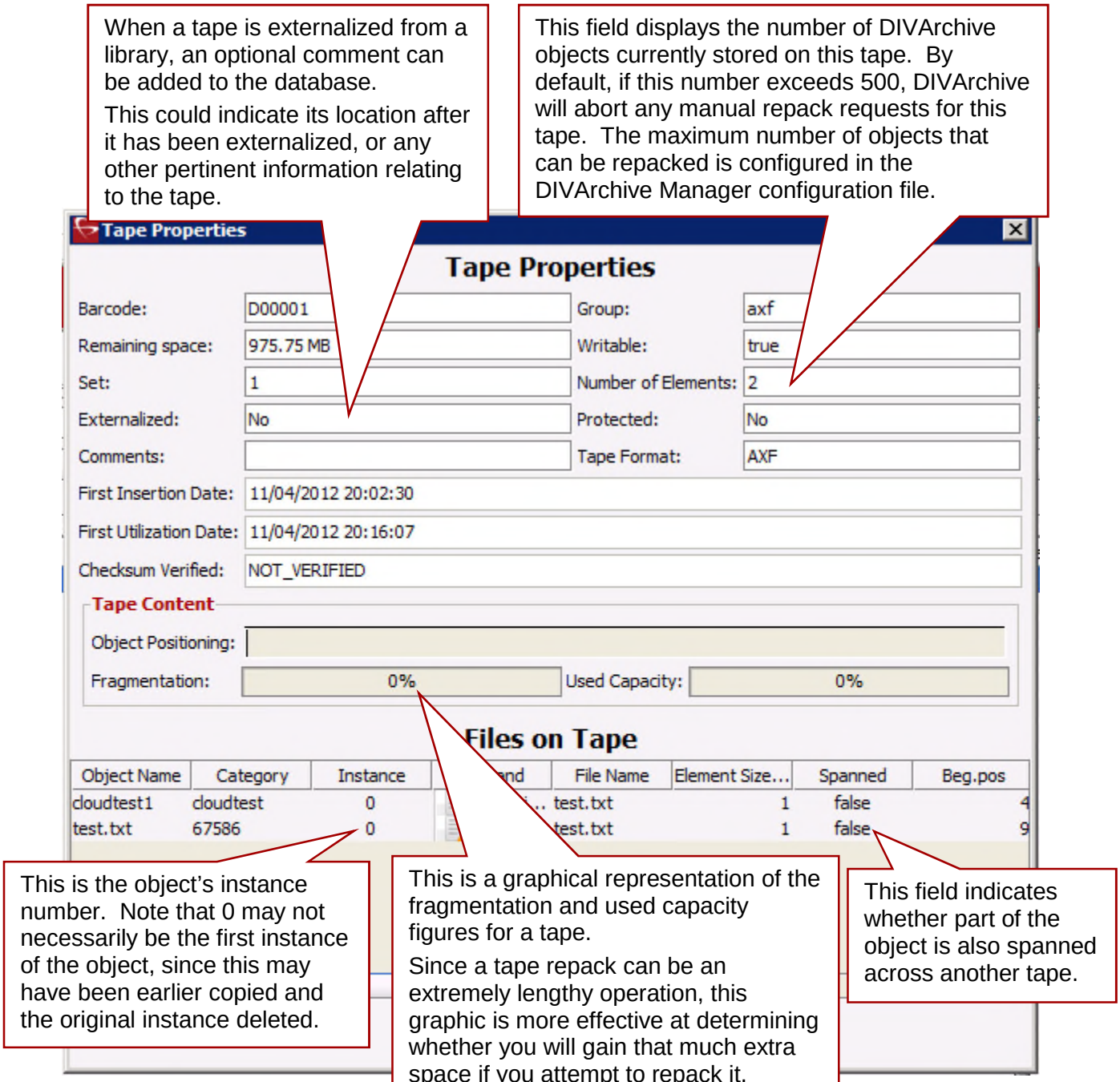


Figure 147: Control GUI – Tapes View Tape Properties Window

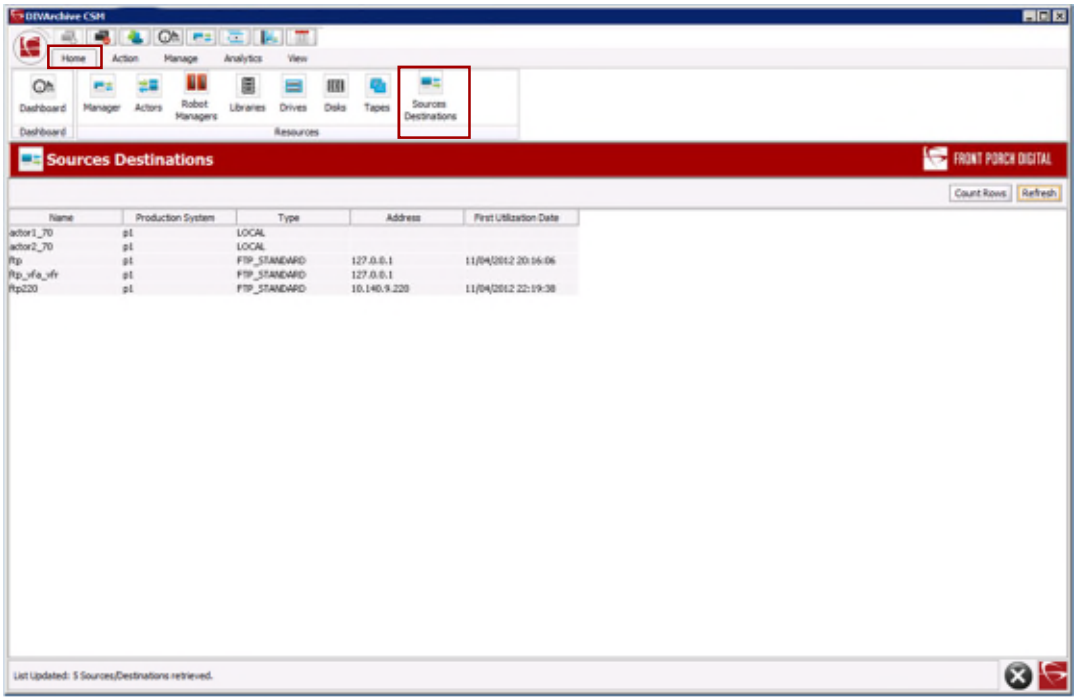


6.6.10 Home Tab: Source/Destinations View

The Control GUI **Source/Destinations View** provides information about the Sources and Destinations identified in the DIVArchive System.

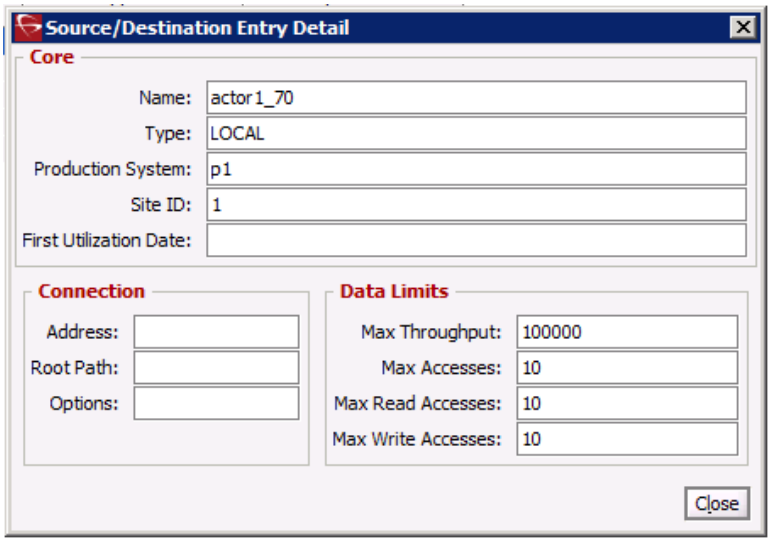
This view is displayed by selecting **Source/Destinations** in the **Home Tab**.

Figure 148: Control GUI – Source/Destination View



Double-clicking on one of the entries will produce the **Entry Details** pop-up window. The information in this window is not editable and is for informational display purposes only.

Figure 149: Control GUI – Source/Destination Entry Details Window



6.6.11 Action Tab: Automatic Repack

When an object is written to a tape it can only be appended to where the last object was written on that tape. When any object is subsequently deleted from a tape, the space from that object cannot be reused. Eventually, as more and more objects are deleted, tape fragmentation occurs and potentially develops a considerable amount of unusable space in the tape library.

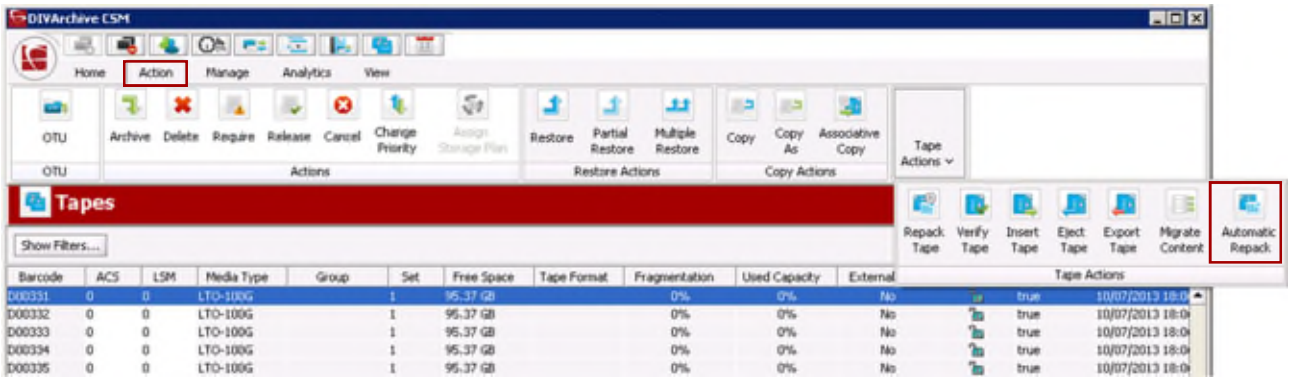
This unusable space can be reclaimed by repacking the tape. The DIVArchive repack process reads all material from the tape being repacked to a temporary cache and then writes it back to a new tape in the same group as the original (*sequentially*).

A tape repack can be done manually using the **Repack Tape** command, or can be triggered automatically when tape fragmentation and used capacity thresholds are exceeded.

The **Automatic Repack** can be enabled or disabled clicking the **Automatic Repack Button** on the **Action Tab**.

Note: Automatic Repack ignores WORM Media. If WORM Media is repacked manually, the space is not recoverable.

Figure 150: Control GUI Action Tab – Automatic Repack



Once the **Automatic Repack Button** is selected, the window below is displayed. To enable **Automatic Repack** check the box and click the **Send Button**. To disable it, uncheck the box and click the **Send Button**.

Figure 151: Automatic Repack Enable/Disable Window

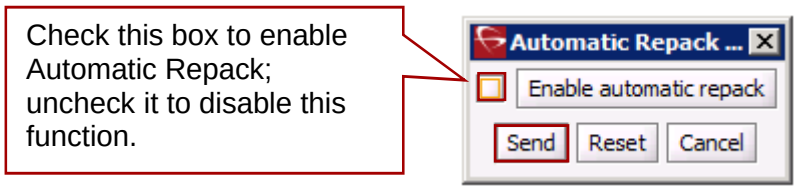
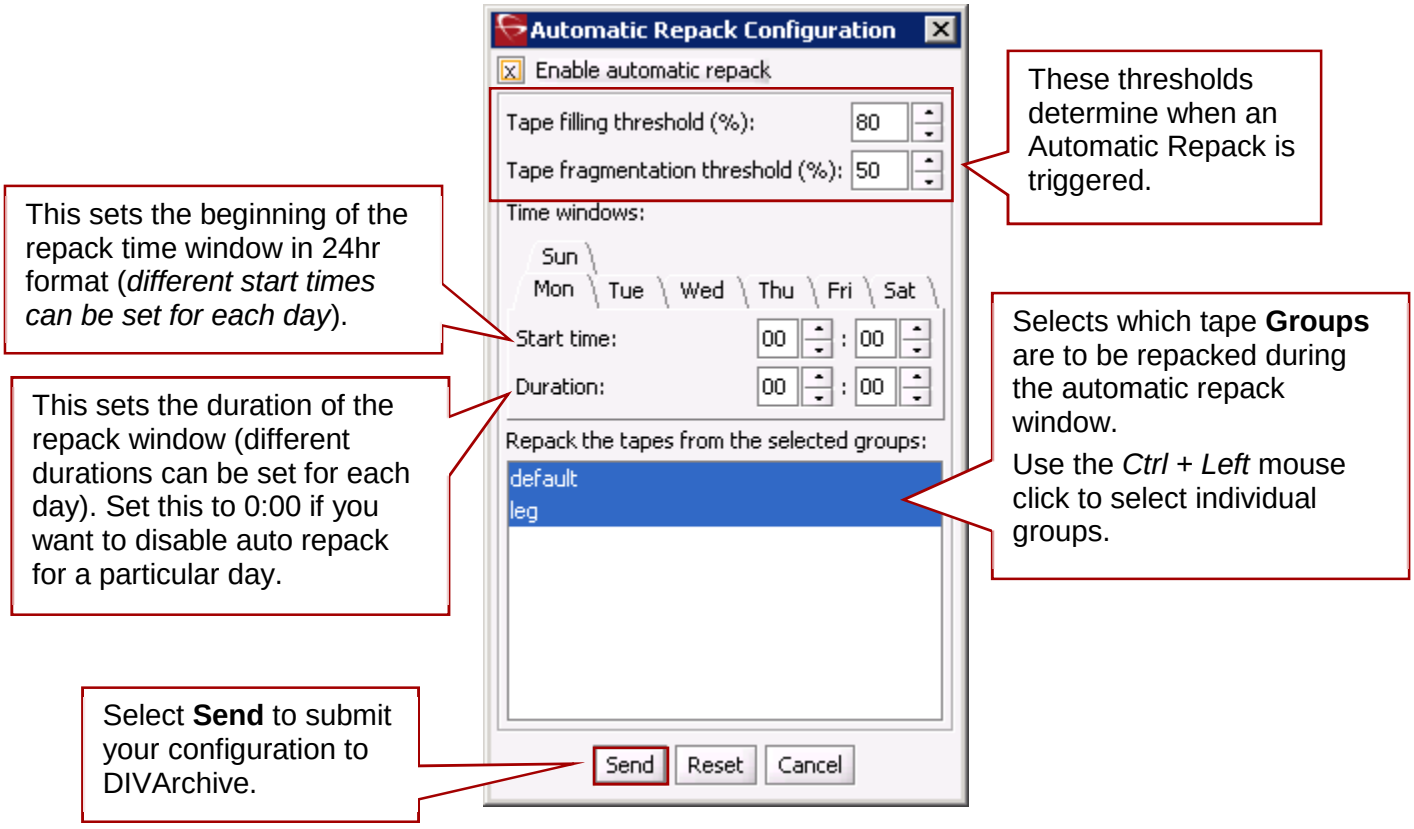


Figure 152: Control GUI – Tools Menu – Automatic Repack Configuration Window



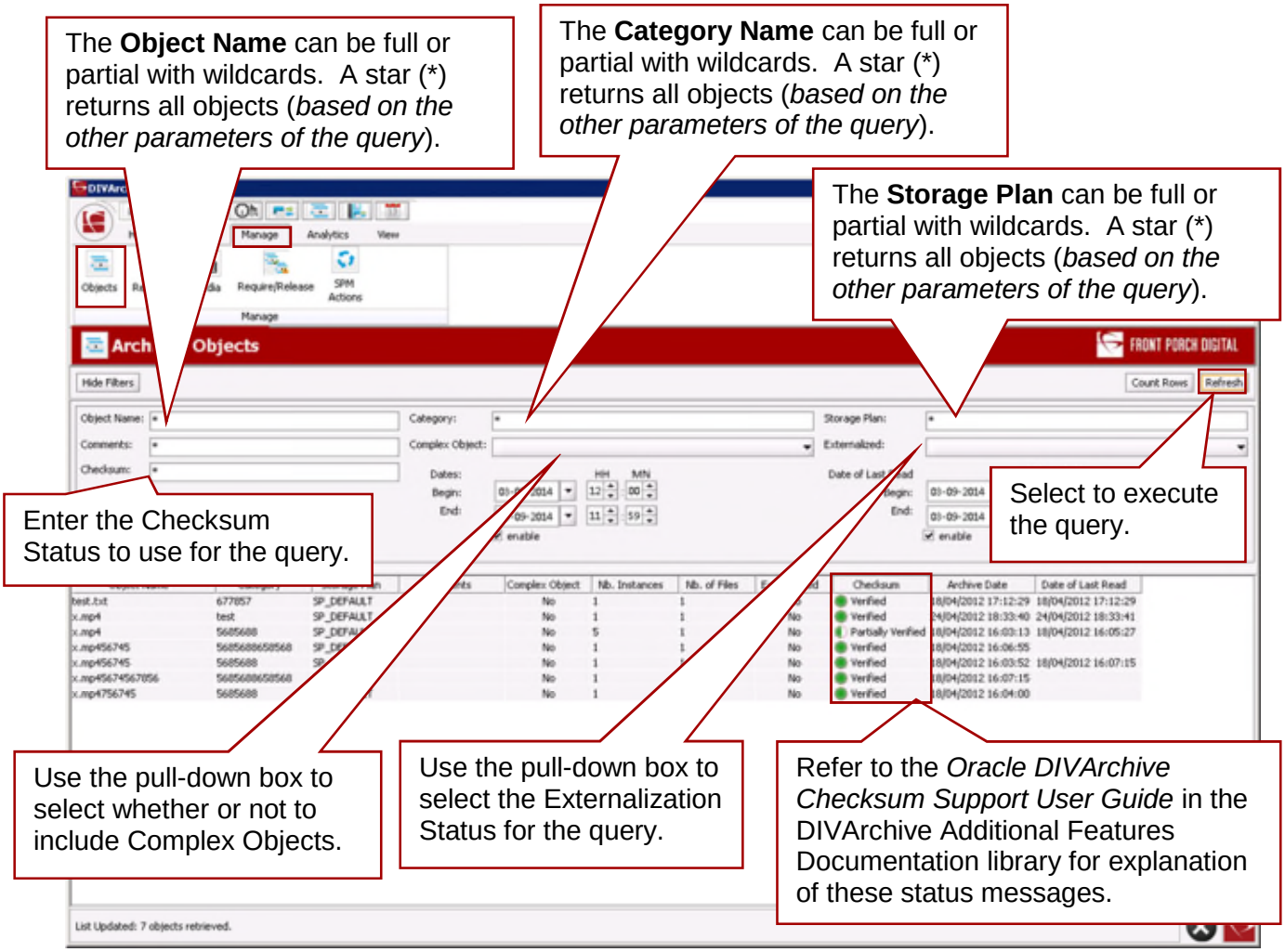
Notes:

- **You cannot specify a different *Start time* and *Duration* for different groups.**
- **Different groups cannot be selected for different days.**
- **The selections made apply to the entire list of selected groups as a whole and not for each separate group.**

6.6.12 Manage Tab: Objects View

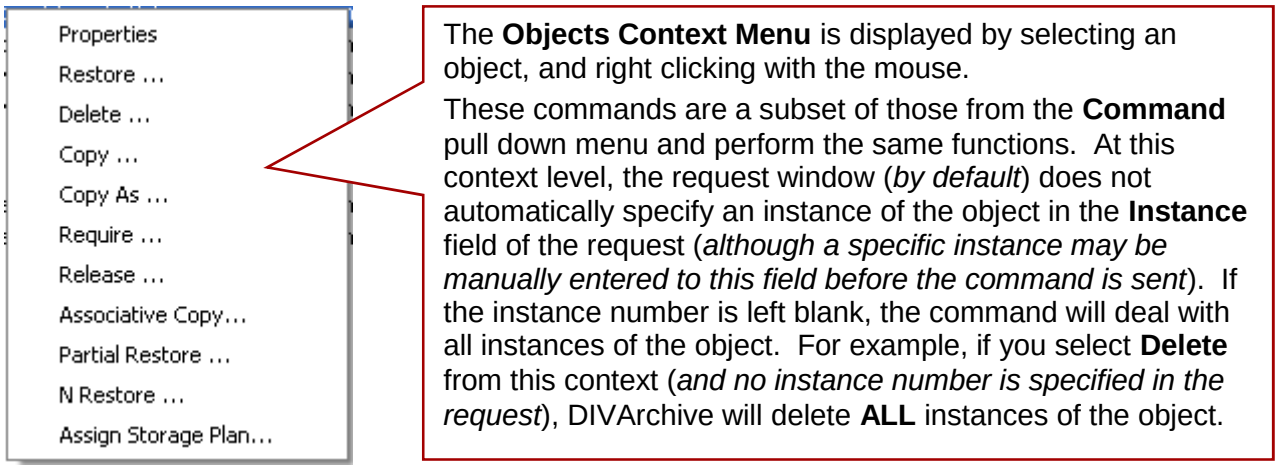
This view is displayed by selecting **Objects** in the **Manage Tab**. You must at least be connected to the DIVArchive Database to access this view.

Figure 153: Control GUI – Objects View



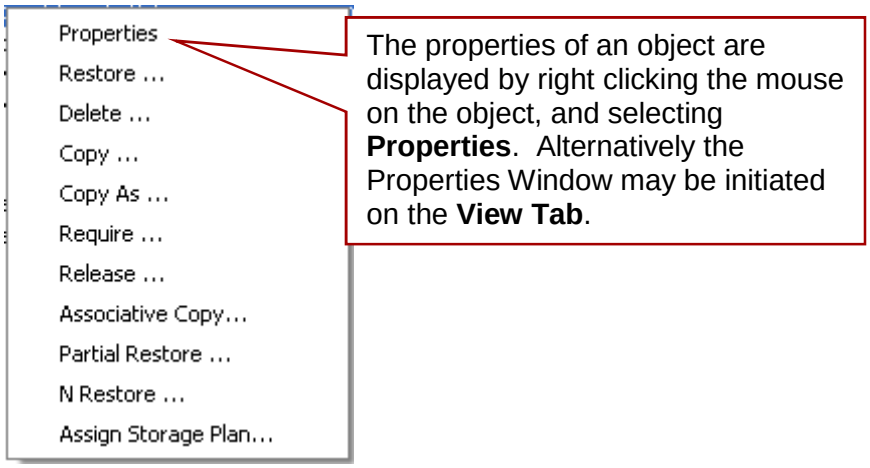
6.6.12.1 Objects Context Menu

Figure 154: Control GUI – Objects View – Context Menu



6.6.12.2 Object Properties

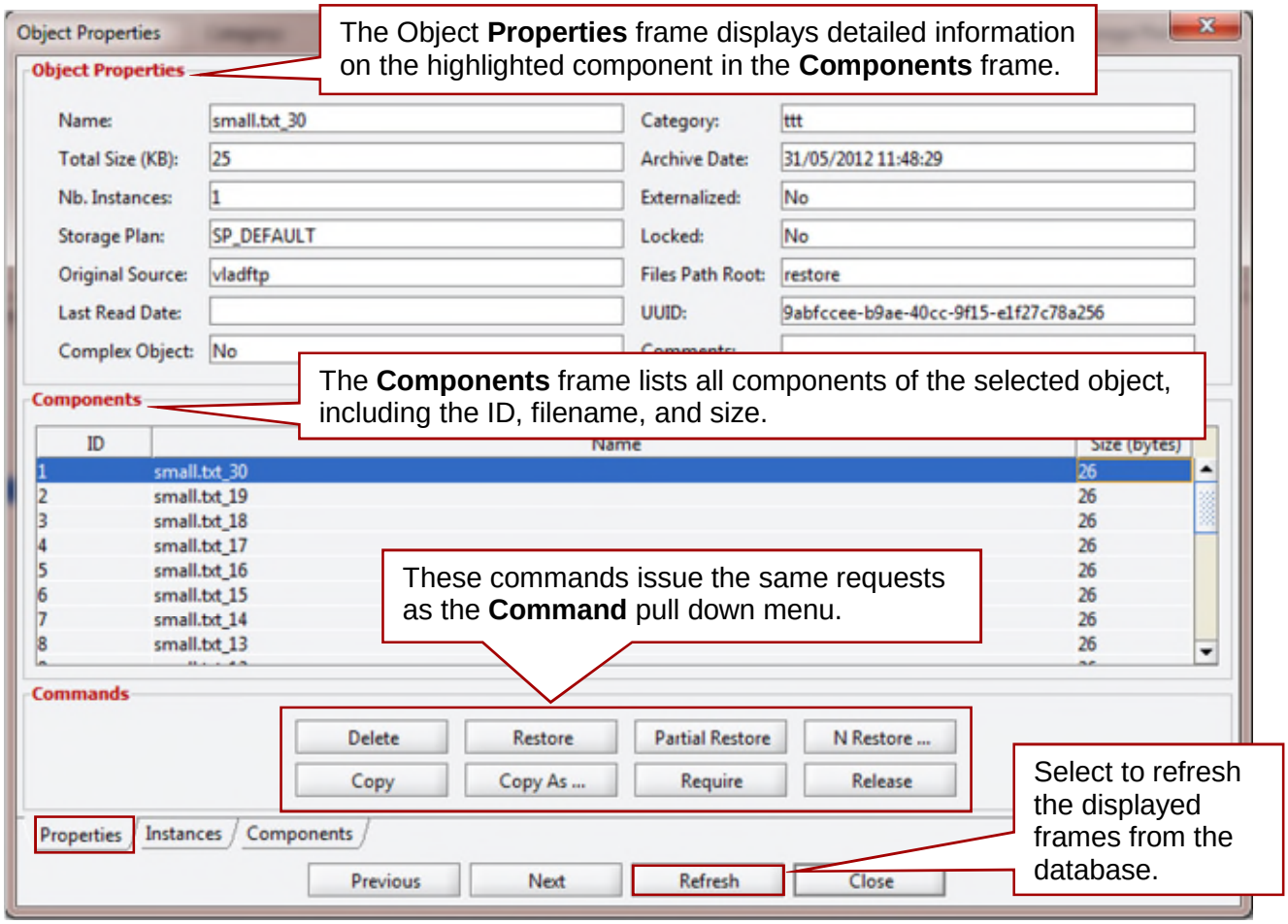
Figure 155: Objects Context Menu



The **Object Properties Dialog** deals with an object's properties, instances, and components. Therefore, a valid instance number must be specified in any command issued from this view or you will receive an error message when submitting the command.

This also includes removing the instance number entirely from the request (*e.g. you cannot delete all instances of an object from this view by leaving the Instance field empty*). Additionally, this view will not allow the last instance of the object to be deleted (*DIVArchive will automatically abort this request*).

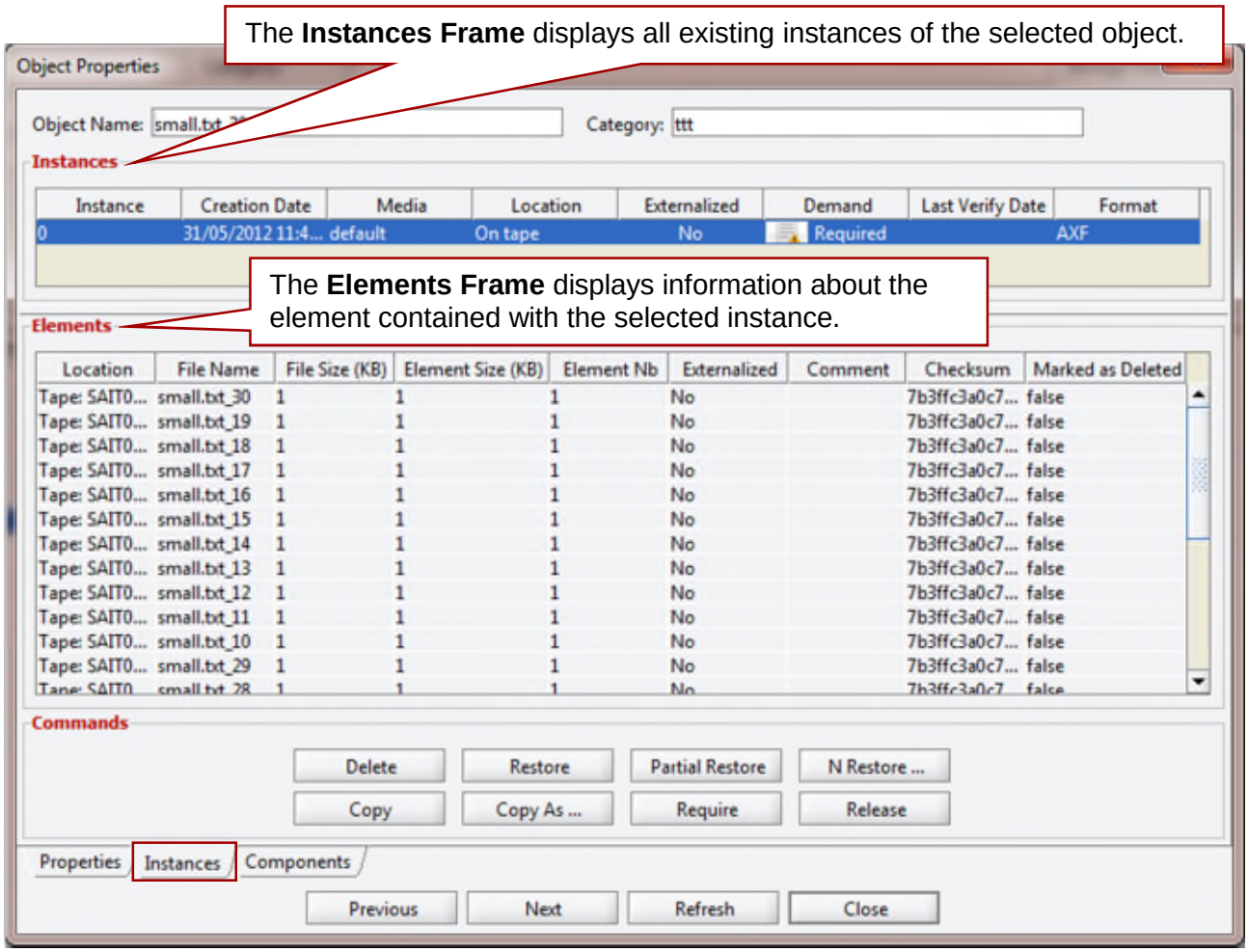
Figure 156: Control GUI – Object Properties – Properties Tab



Note: If a file (*or part thereof*) of an object instance is spanned across two or more tapes, and only one tape of the set is externalized, the instance is still considered externalized. However, an object (*i.e. all instances*) is only considered externalized if *all* instances of that object are externalized.

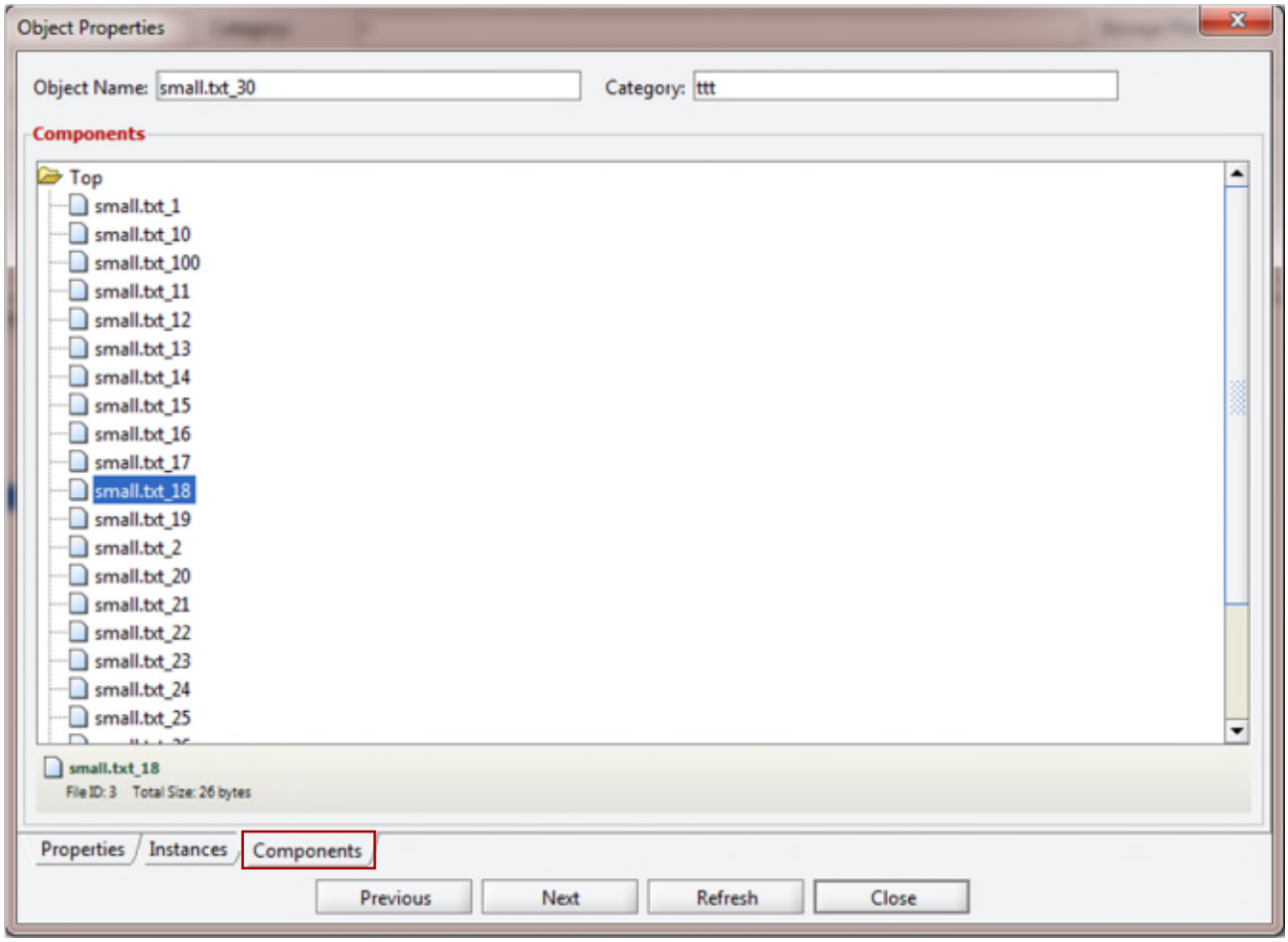
Clicking on the **Instances Tab** in the bottom section of the figure above will produce the Object's Instances Window shown below. This view displays the instances of the object and the elements of each instance.

Figure 157: Control GUI – Object Properties – Instances Tab



Clicking on the **Components Tab** in the bottom section of the figure above will produce the Object's Component Window shown below. Clicking on the component will display the component's information at the bottom of the window.

Figure 158: Control GUI – Object Properties – Components Tab



6.6.13 Manage Tab: Requests View

By default, the **Manager Requests View** is limited to 300 lines. Completed, cancelled, and aborted requests are cleared if the Control GUI is disconnected or relaunched. The **Requests View** is provided for retrieval of previously completed requests from the DIVArchive Database. It is commonly used by Oracle Technical Support to troubleshoot a previously reported issue.

Any errors can quickly be identified by clicking the Errors column. Once a particular request's Request ID is determined, it can be entered in the **Events View** to export the request's Event Log from the Control GUI to a text file.

This view is displayed by selecting **Requests** in the **Manage Tab**. You must at least be connected to the DIVArchive Database to access this view.

Figure 159: Control GUI – Requests View

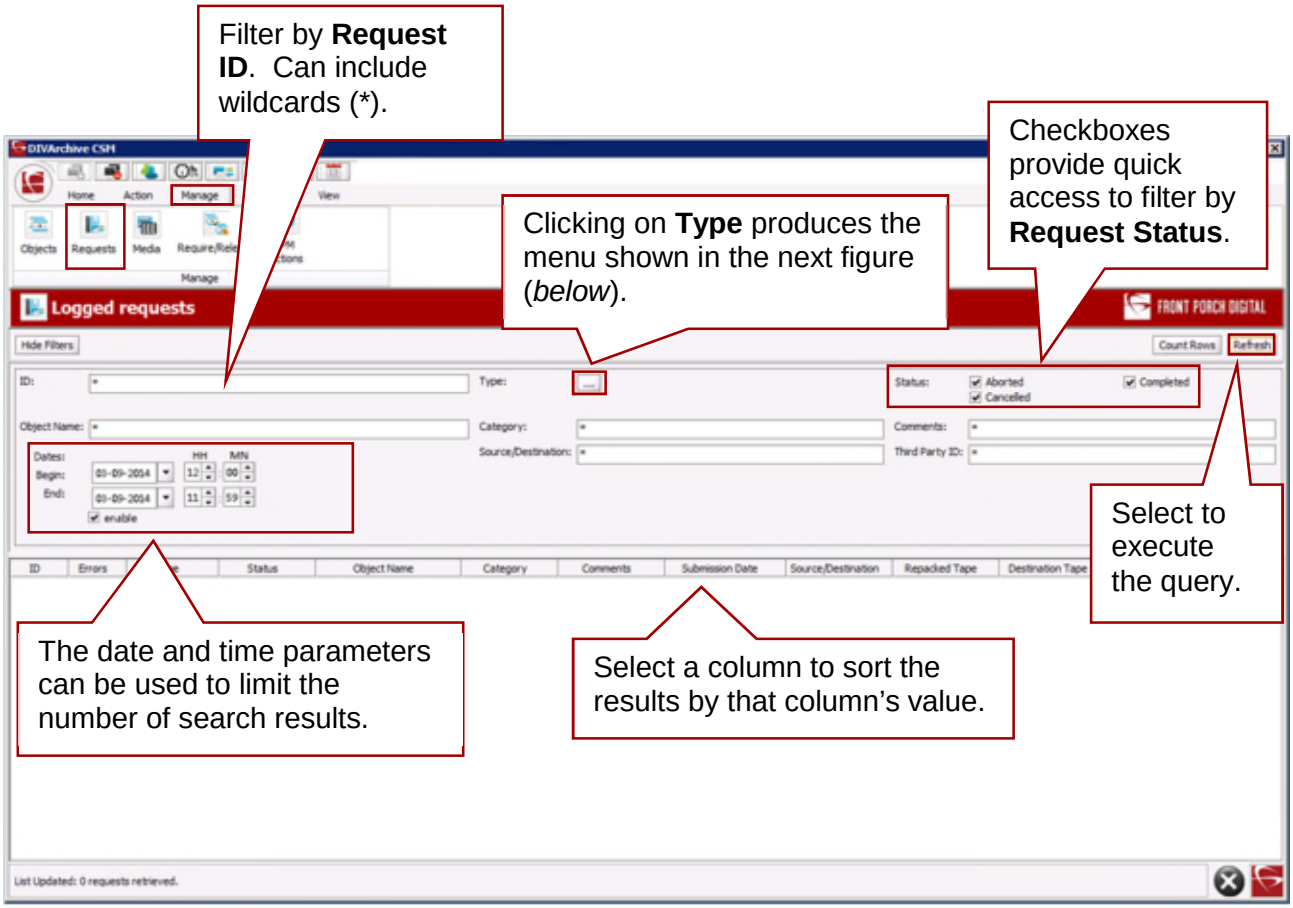


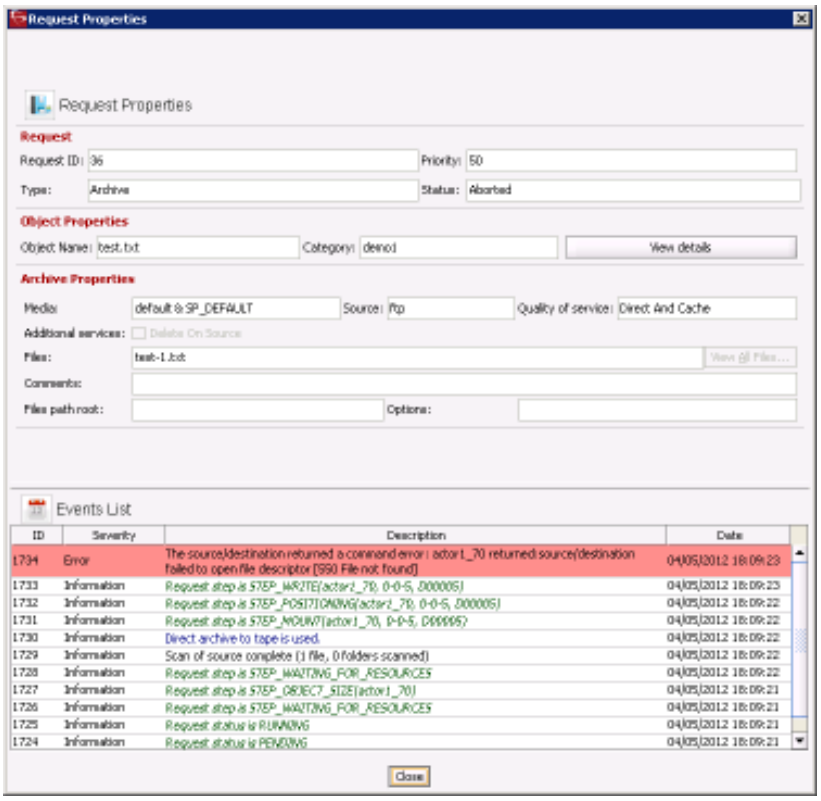
Figure 160: Control GUI - Requests View – Type … Window

This sub-menu can be displayed by selecting the **Type …** icon. Results returned by the query can be limited by checking one of the request types listed.

If no boxes are checked, then all request types are returned in the query.

Double-clicking on a Request displays the Request Properties Window for viewing information about the selected request.

Figure 161: Control GUI – Request Properties Window



Up to 50,000 logged requests are stored in the DIVArchive database. Once 50,000 requests are reached, the oldest requests are overwritten. For most facilities, this provides at least 6~12 months of logged requests.

6.6.14 Manage Tab: Media View

The **Media View** gives information for each of the Tape Groups and Disk Arrays identified in the DIVArchive System.

Figure 162: Control GUI – Media View – 1

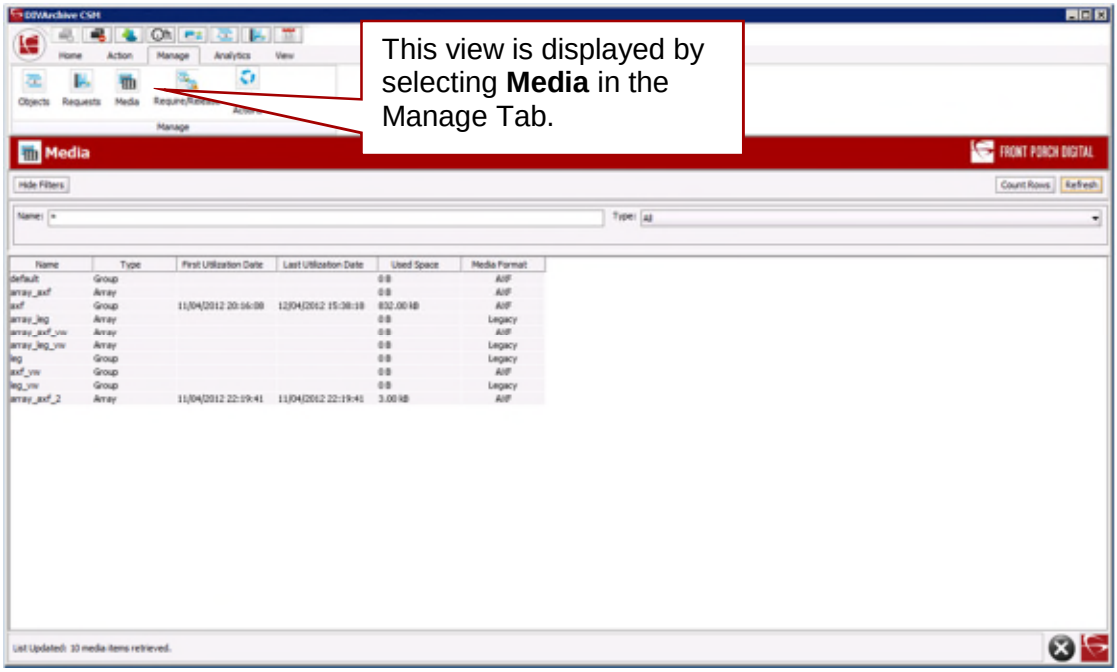
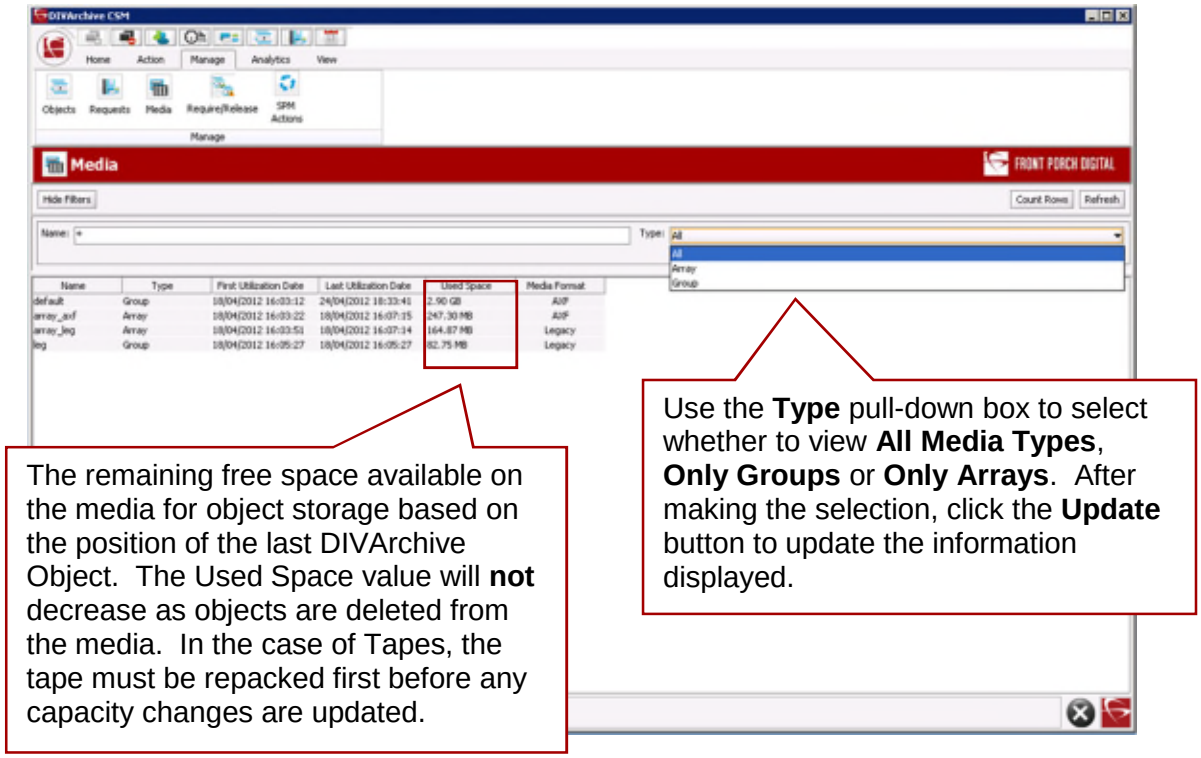
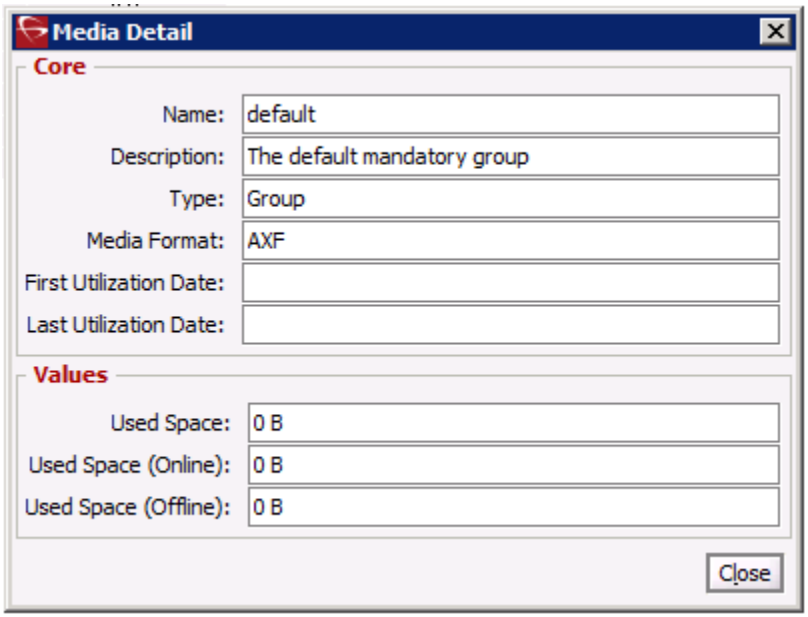


Figure 163: Control GUI – Media View – 2



Double-clicking on the Tape Group or Disk Array produces a pop-up window displaying details about that Group or Array. The window is for informational purposes only and is not editable.

Figure 164: Control GUI – Media View – Group Media Detail Window



6.6.15 Manage Tab: Require/Release View

The **Require/Release View** allows an operator to query the DIVArchive database for:

- Released instances that can be externalized from any of the libraries managed by DIVArchive.
- Externalized instances that are now required to be inserted into a library.
- A list of tapes that need to be inserted to fulfill restore requests (*Required Tapes*).
- A list of tapes that can be externalized from the library (*Releasable Tapes*).

Note: A releasable tape is one that only contains released instances.

This view is displayed by selecting **Require/Release** in the **Manage Tab**. You must at least be connected to the DIVArchive Database to access this view.

Figure 165: Control GUI – Require/Release View

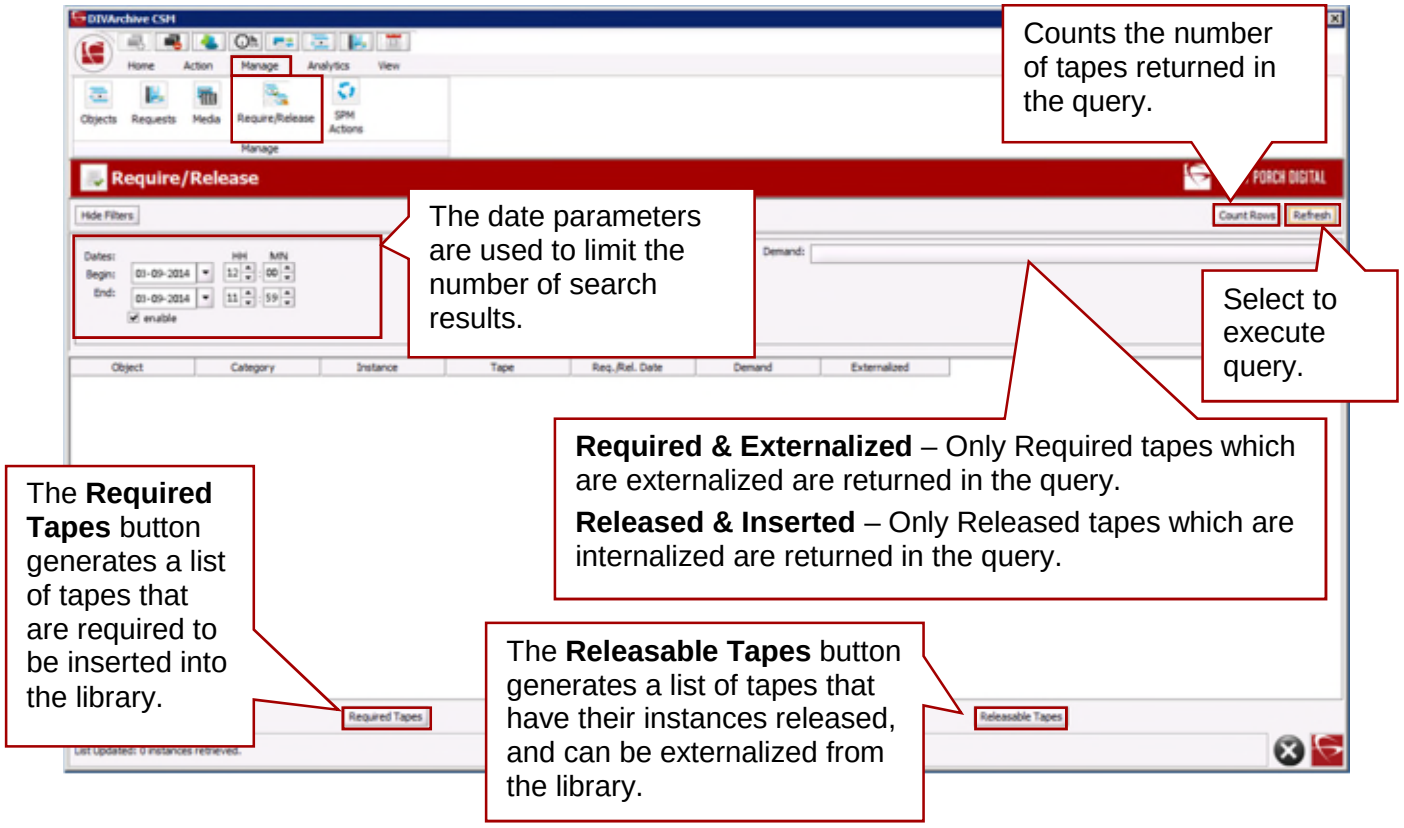


Figure 166: Control GUI – Require/Release View – Required Tapes Window

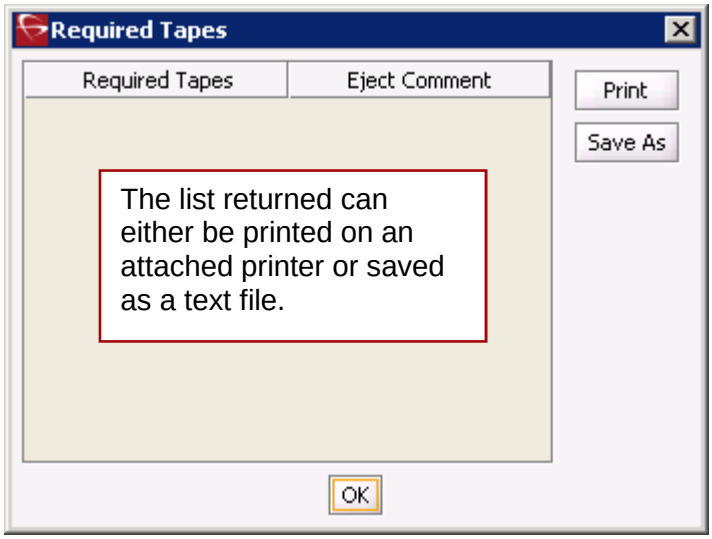
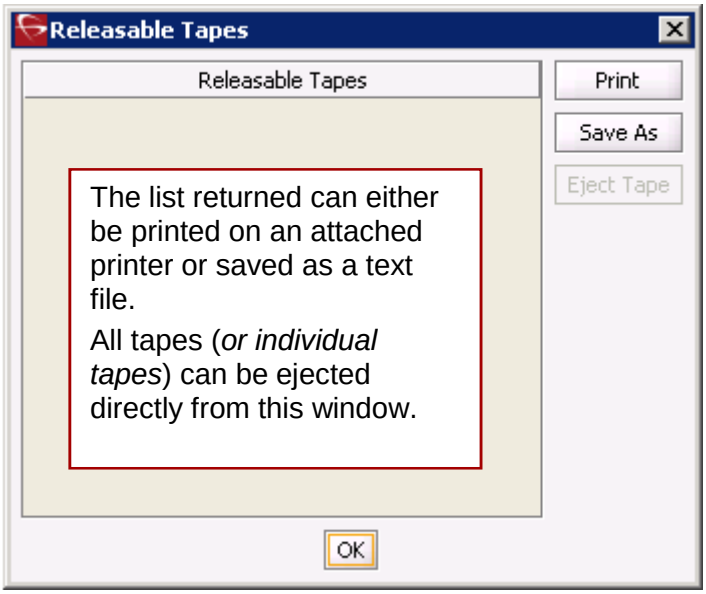


Figure 167: Control GUI – Require/Release View – Releasable Tapes Window

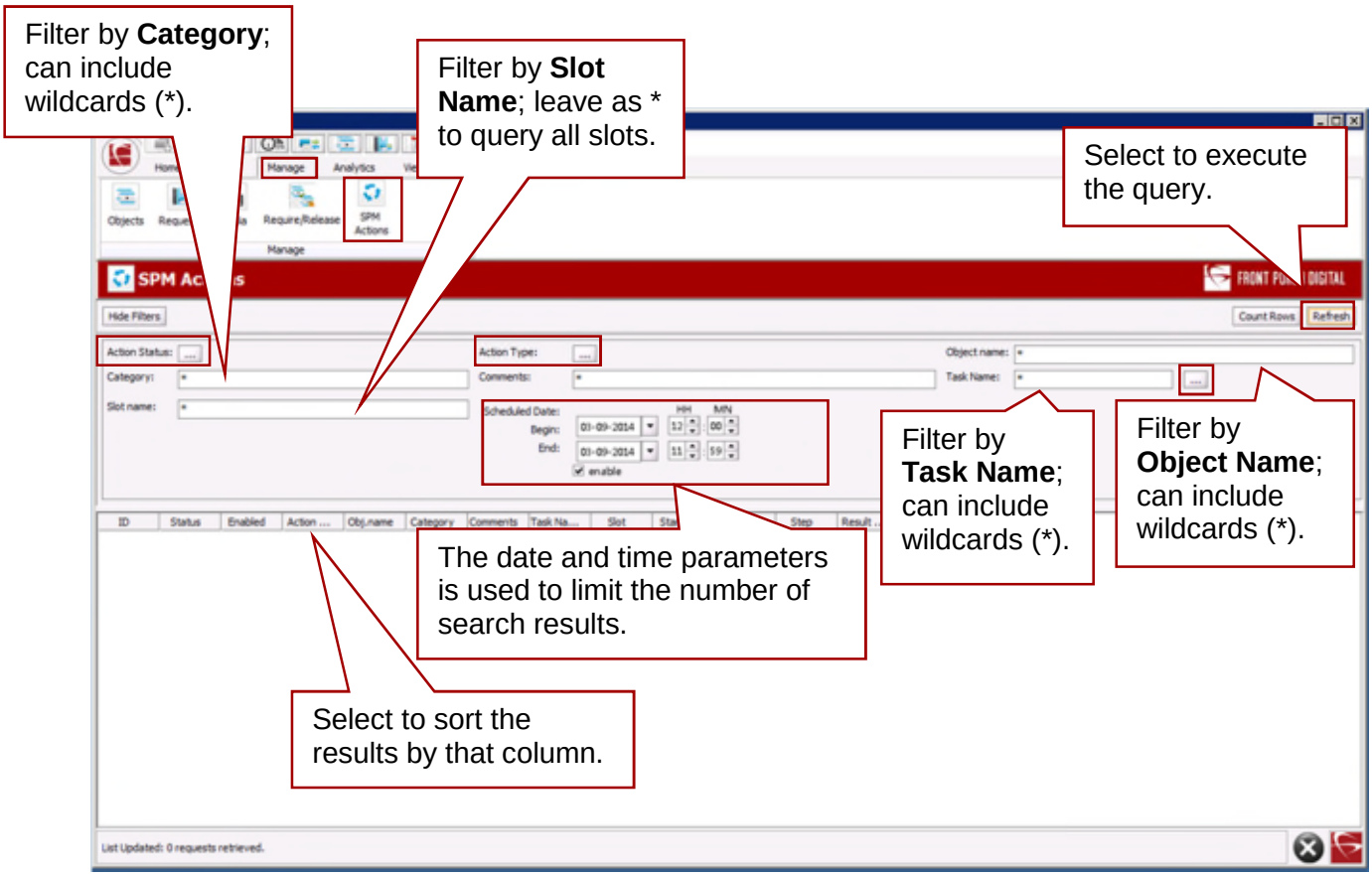


6.6.16 Manage Tab: SPM Actions (Storage Plan Manager Actions View)

The **SPM Actions View** is only applicable to those installations having the DIVArchive Storage Plan Manager (*SPM*) installed. It enables more detailed information to be extracted from the DIVArchive Database relating to the actions that have been initiated to DIVArchive from the SPM module.

This view is displayed by selecting **SPM Actions** in the **Manage Tab**. You must at least be connected to the DIVArchive Database to access this view.

Figure 168: Control GUI – SPM Actions View

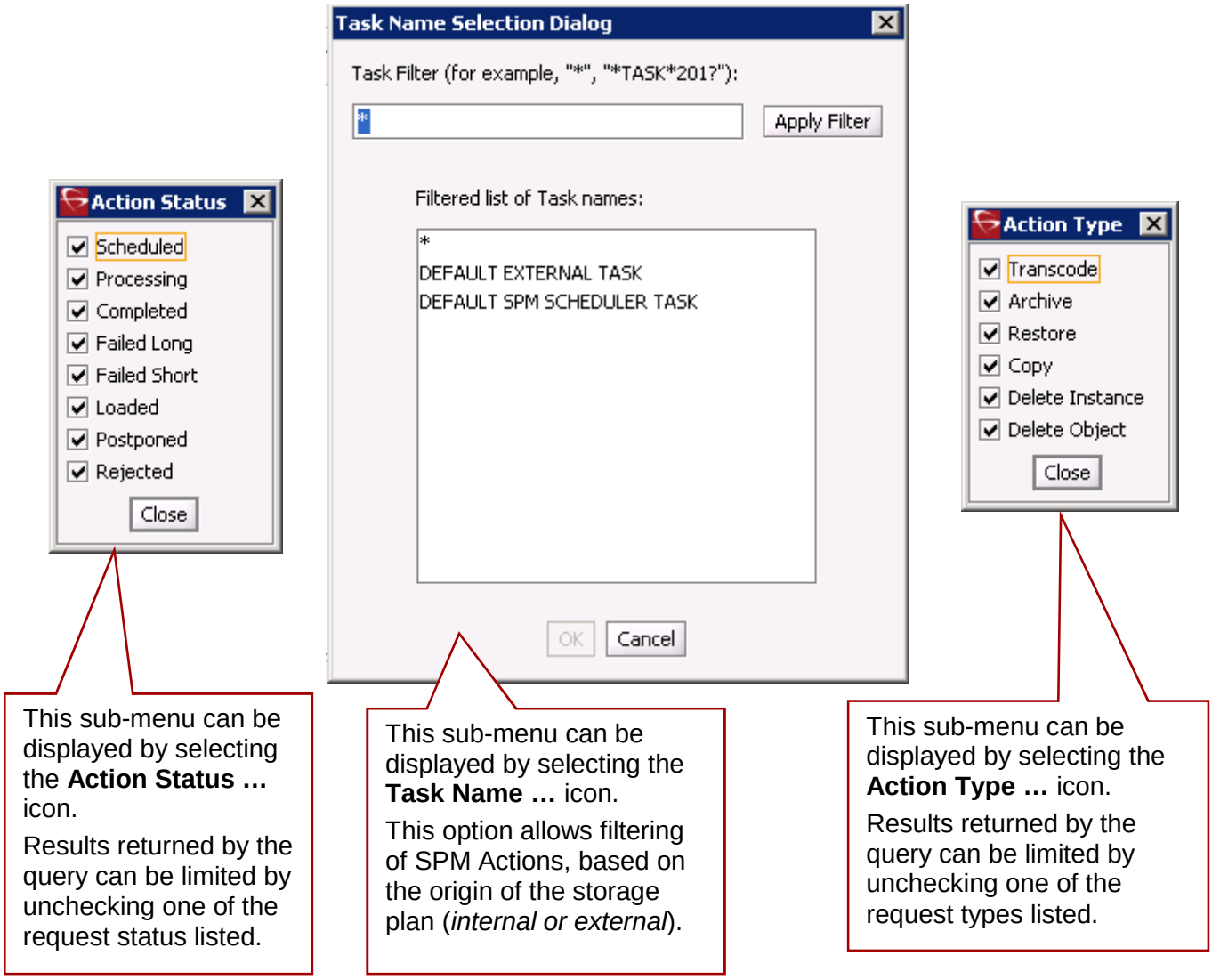


Notes:

- **SPM will retry failed copy, delete and restore actions after the configured failed action retry interval as set in the SPM configuration file. Refer to the *Oracle DIVArchive Storage Plan Manager (SPM) Guide* in the DIVArchive Additional Features Documentation library for detailed information.**
- **SPM supports disk cleaning based on the object's archived date. Previously, the SPM disk cleaning feature only supported cleaning based on an object's last access time and object size.**

The buttons labeled with "…" in the figure above will open the respective windows in the following figures:

Figure 169: Control GUI – SPM Actions View – Additional Filtering Actions



6.6.16.1 SPM Actions Context Menu

Right clicking the mouse on a result returned by the SPM Actions query will display the **SPM Actions Context** menu:

Figure 170: Control GUI – SPM Actions View – Actions Context Menu

Request Properties This displays the request's **Events List** associated with the SPM Action. This is only applicable to SPM Actions where the **Request ID** is non-zero.

Reschedule Action If the Storage Plan Manager initiated request failed (*e.g. the medium or associated Actor(s) for the slot were unavailable*), this allows that SPM Action to be retried.

6.6.16.2 SPM Actions Column Definitions

Table 39: Control GUI – SPM View Column Definitions

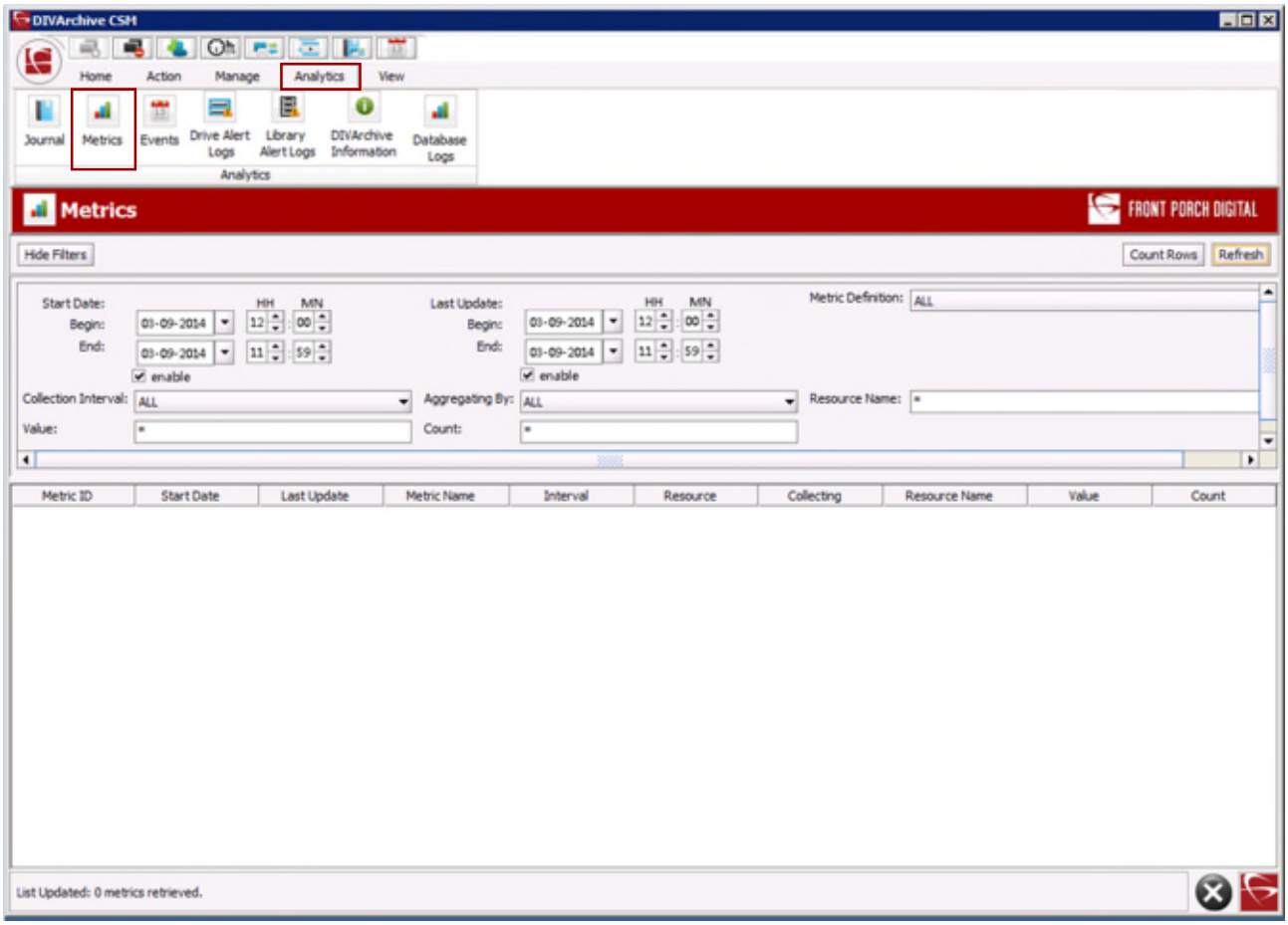
Column Name	Description
ID	This ID is internally generated in the DIVArchive Database by the Storage Plan Manager when an action is considered or a request is sent to DIVArchive.
Status	• **Scheduled:** This indicates when the SPM Action is scheduled to occur. • **Processing:** The SPM Action is being processed. • **Completed:** The SPM action was successfully completed. • **Failed:** The SPM Action failed.
Enabled	This field indicates whether the associated slot was enabled. Although a slot may be considered part of the Storage Plan processing, no requests will be sent to DIVArchive if the associated slot is disabled in the **Slots Frame** of the **Storage Plans Tab** in the Configuration Utility.
Action Type	• **Transcode:** Requests initiated by `Transcode_archived` request templates. • **Archive:** Requests initiated by `Metadata_archive` or storage request templates. • **Restore:** Requests initiated by Restore request templates. • **Copy:** Requests initiated by Storage request templates. • **Delete Instance:** An instance was deleted. • **Delete Object:** The entire object was deleted.
Obj. Name	Name of the object associated with the SPM Action.

Column Name	Description
Category	Category of the object associated with the SPM Action.
Task Name	Task Name relates to whether the associated Storage Plan (*as defined in the Storage Plans Frame of the Storage Plans Tab of the Configuration Utility*) is internal to this DIVArchive System or external (*DIVAnet*).
Slot	The associated slot for the SPM Action. The slot names will correspond with those listed in the **Slots Frame** of the **Storage Plans Tab** in the Configuration Utility.
Start At	The scheduled time for the associated SPM Action.
Req. ID	The associated **Request ID** (*as displayed in the Manager Current Requests view*) for the request initiated by the Storage Plan Manager to DIVArchive. Actions returned in a query that involve internal SPM processing will display 0 in this column (*i.e. they are not associated with a request sent to DIVArchive*).
Step	Displays the current processing step for the Action.
Result Code	Displays the Result Code for the Action.
Failures	Displays the number of failure occurring during processing.

6.6.17 Analytics Tab: Metrics

DIVAprotect Metrics can be examined via the **Metrics Vie*w*** of the Control GUI. Below is a sample **Metrics View**:

Figure 171: Control GUI – DIVAprotect Metrics View



The **Metrics View** provides a set of filters to narrow down searches. Information can be filtered by Metric Definition, Collection Interval, Aggregation Item, Resource Name, Value, Count, Start Date, and Last Update Date. The **Metric Definition** drop-down list contains the metrics defined in the Configuration Utility plus the built-in ones (***DIVAPROTECT****).

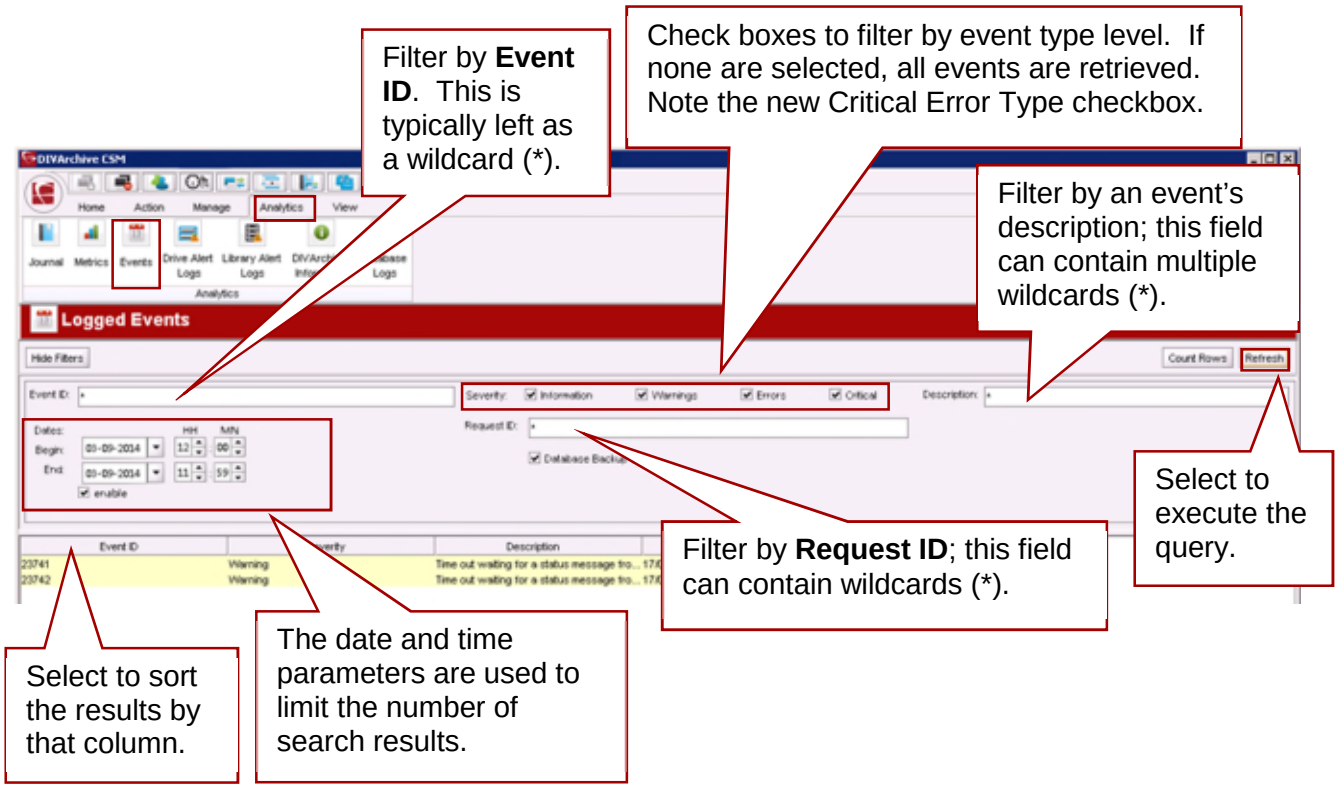
Refer to the *Oracle DIVArchive DIVAprotect User Guide* in the DIVArchive Additional Features Documentation library for more information.

6.6.18 Analytics Tab: Events View

The **Events View** is typically used in conjunction with the **Requests View** for troubleshooting purposes.

This view is displayed by selecting **Events** in the **Analytics Tab**. You must at least be connected to the DIVArchive Database to access this view.

Figure 172: Control GUI – Events View



When a particular request has failed, the log of that request can be exported to a text file to send to Oracle Technical Support. This information can also be collected by the Oracle Support Engineer using the DIVArchive Customer Information Collection Tool.

When the query is run for the failed request's Request ID (*usually retrieved from the Requests view*), it shows the same events of that request's Event Log. This can be saved as a text file by selecting **Export Table** (*refer to Section 6.6.21*).

DIVArchive stores a maximum of 1,000,000 events in its database. When the number of logged events exceeds this value, DIVArchive will begin overwriting the existing events, beginning with the oldest entry.

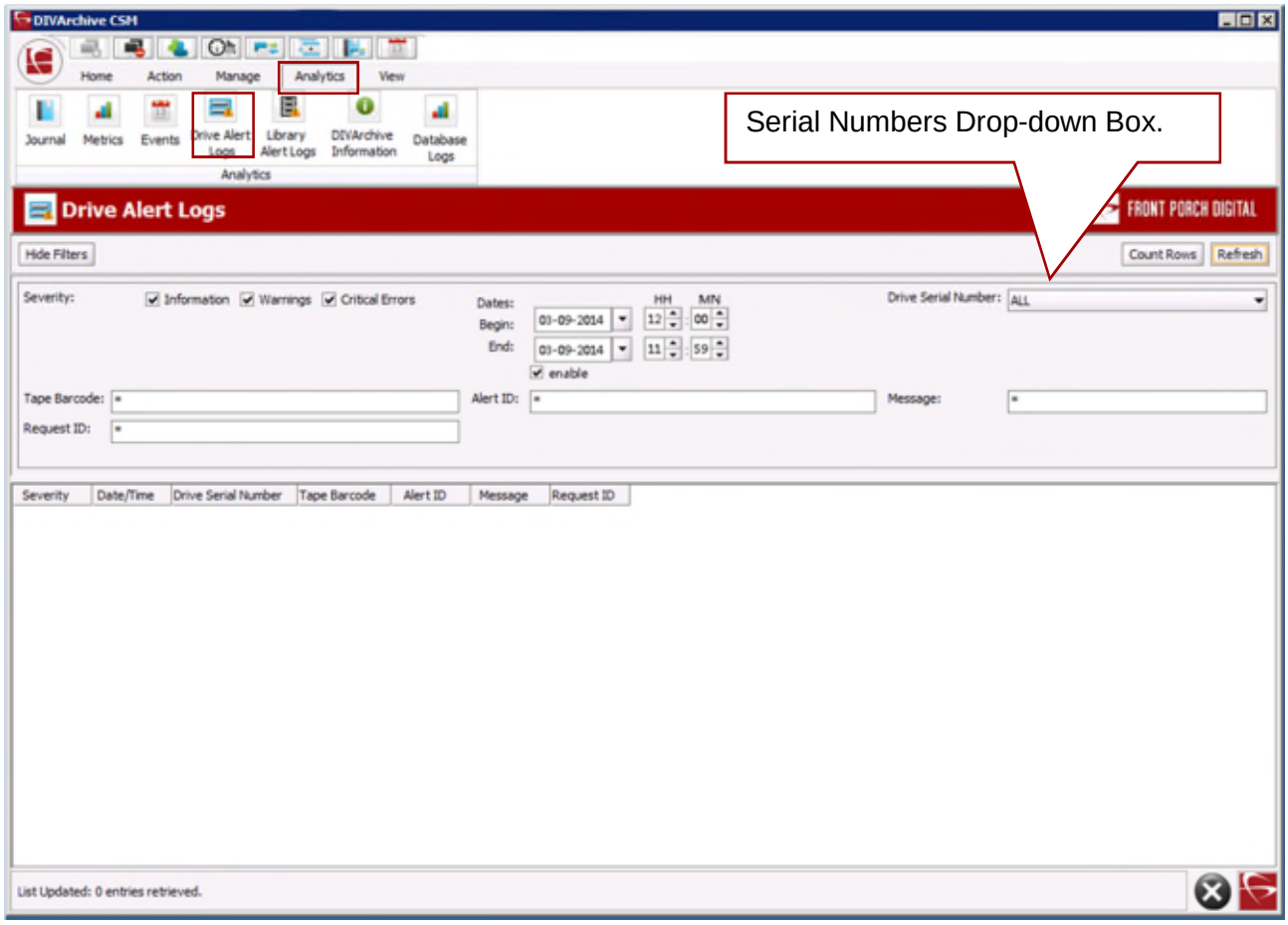
Beginning with DIVArchive version 7.2 a new Error Type has been introduced named **`CRITICAL`**. Users can filter by this Error Type by clicking on the **Severity Checkbox** in the **Events View** of the **Analytics Tab** in the Control GUI.

6.6.19 Analytics Tab: Drive Alert Logs View

The **Drive Alert Logs View** lists errors reported by tape drives. This information is vendor-specific and may vary depending on the make and model. A set of filters is available to narrow down searches, for instance you can look for errors related to a particular tape.

This view is displayed by selecting **Drive Alert Logs** in the **Analytics Tab**.

Figure 173: Control GUI – Drive Alert Logs View



The Drive Alert Logs View displays the following fields:

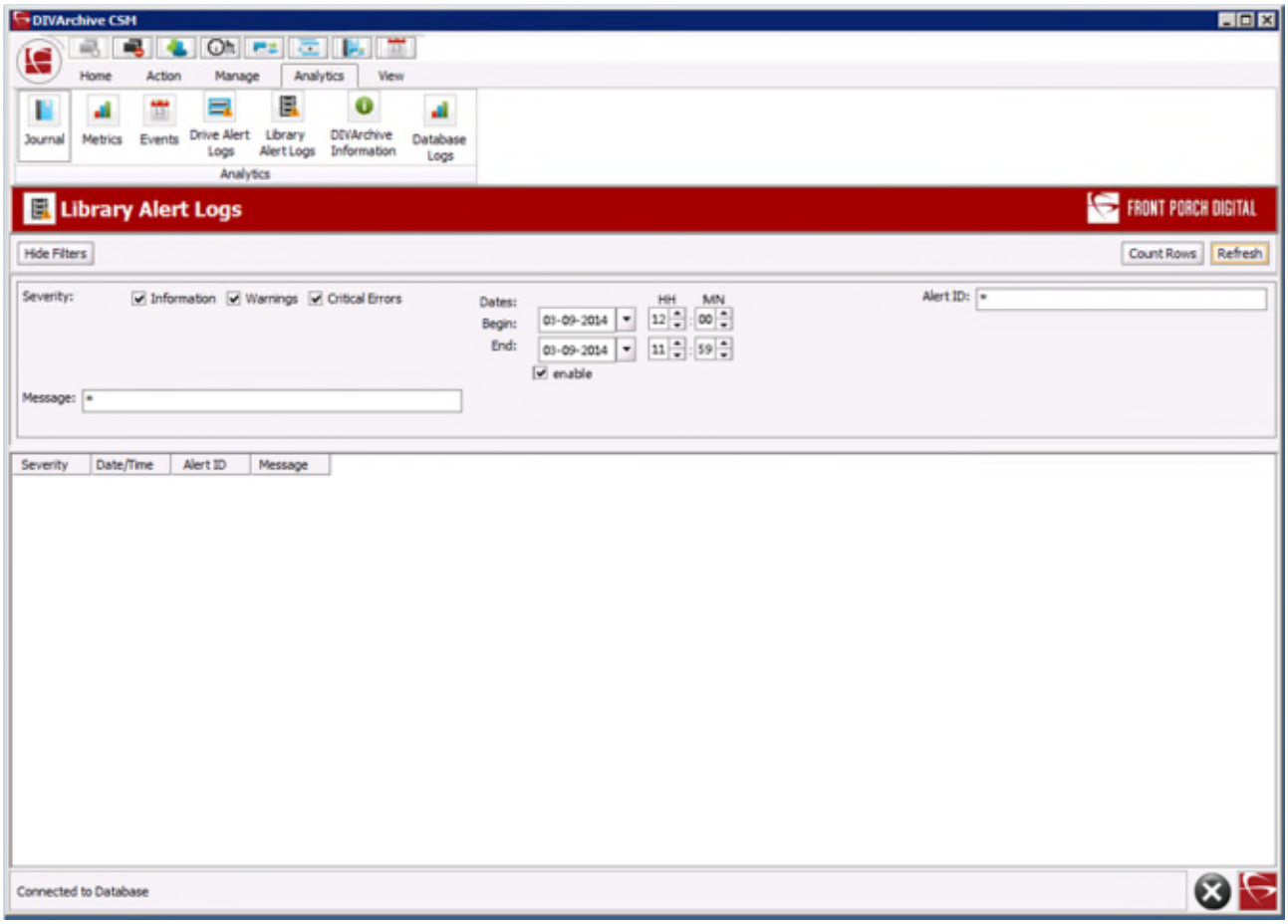
- Severity of the alert (*Informational, Warning, Error*).
- Date and time of occurrence.
- Drive Serial Number identifying the drive that reported the alert.
- Tape Barcode mounted when the alert was reported.
- Alert ID as reported by the library (*vendor-specific*).
- Message field as reported by the library (*vendor-specific*).
- DIVArchive Request ID related to the alert, if applicable.

6.6.20 Analytics Tab: Library Alert Logs View

The **Library Alert Logs** *View* lists errors reported by directly-attached, SCSI-protocol libraries. This information is vendor-specific and may vary depending on the make and model. A set of filters is available to narrow down searches.

This view is displayed by selecting **Library Alert Logs** in the **Analytics Tab**.

Figure 174: Control GUI – Library Alert Logs View



The Library Alert Logs View displays the following fields:

- Severity of the alert (*Informational, Warning, Error*).
- Date and time of occurrence.
- Alert ID as reported by the library (*vendor-specific*).
- Message field as reported by the library (*vendor-specific*).

6.6.21 Analytics Tab: DIVArchive Information

The amount of storage that DIVArchive will manage is dictated by the configuration of DIVArchive. When the total managed capacity reaches 90% of the capacity, DIVArchive will begin issuing periodic warning messages in the **Manager Current Requests View** of the Control GUI.

Once the managed capacity meets the capacity, the warning messages become more frequent. Once this limit is reached no further archive requests will be accepted by DIVArchive, and will be automatically aborted (*restore requests however will continue to be accepted*).

To view the Storage and Capacity information click on the **DIVArchive Information Button** in the **Analytics Tab**.

Figure 175: Analytics Tab – DIVArchive Information Button

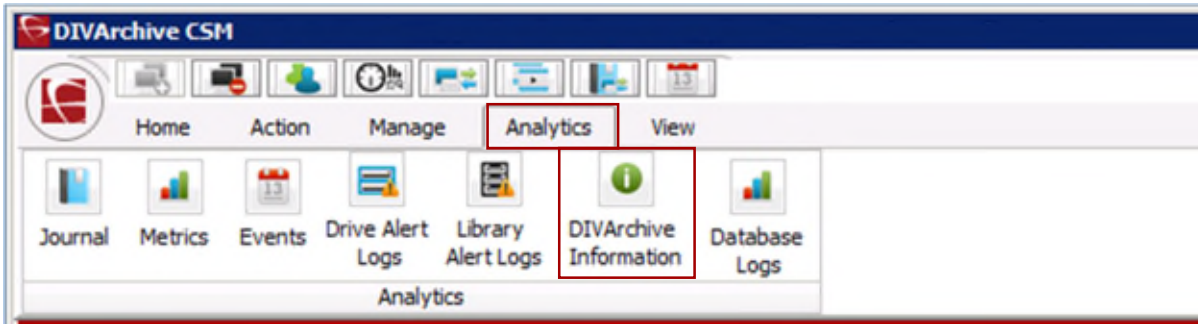
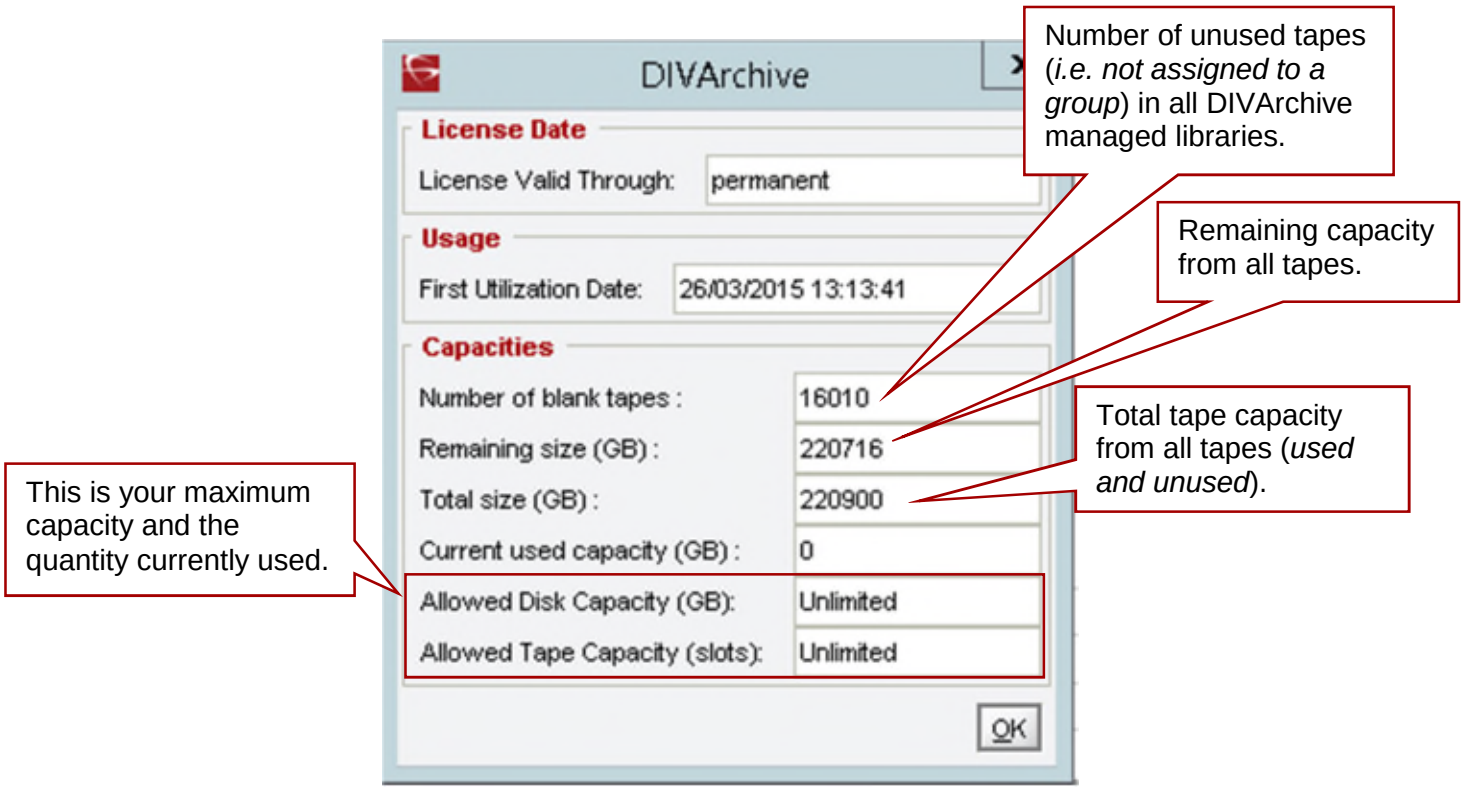


Figure 176: Control GUI – Start Menu – DIVArchive Information Window

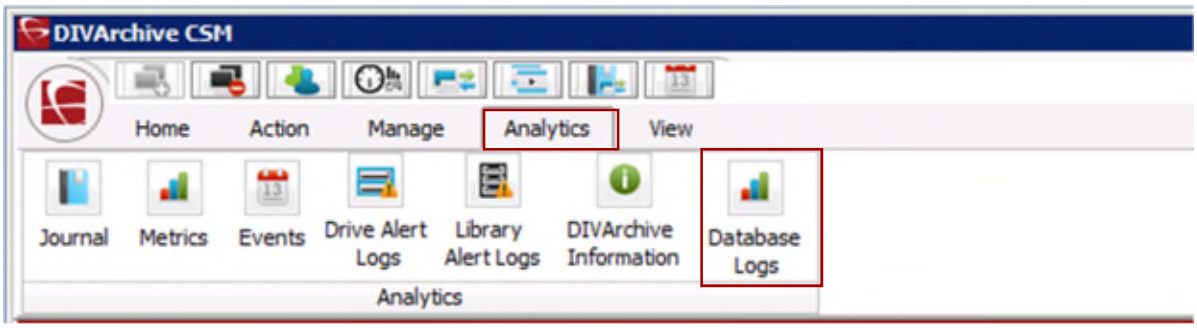


6.6.22 Analytics Tab: Database Logs

The **Database Logs View** lists errors reported to the Oracle Database. A set of filters is available to narrow down searches, for instance you can look for errors related to a particular tape.

This view is displayed by selecting the **Database Logs Button** in the **Analytics Tab**.

Figure 177: Control GUI – Analytics Tab – Database Logs

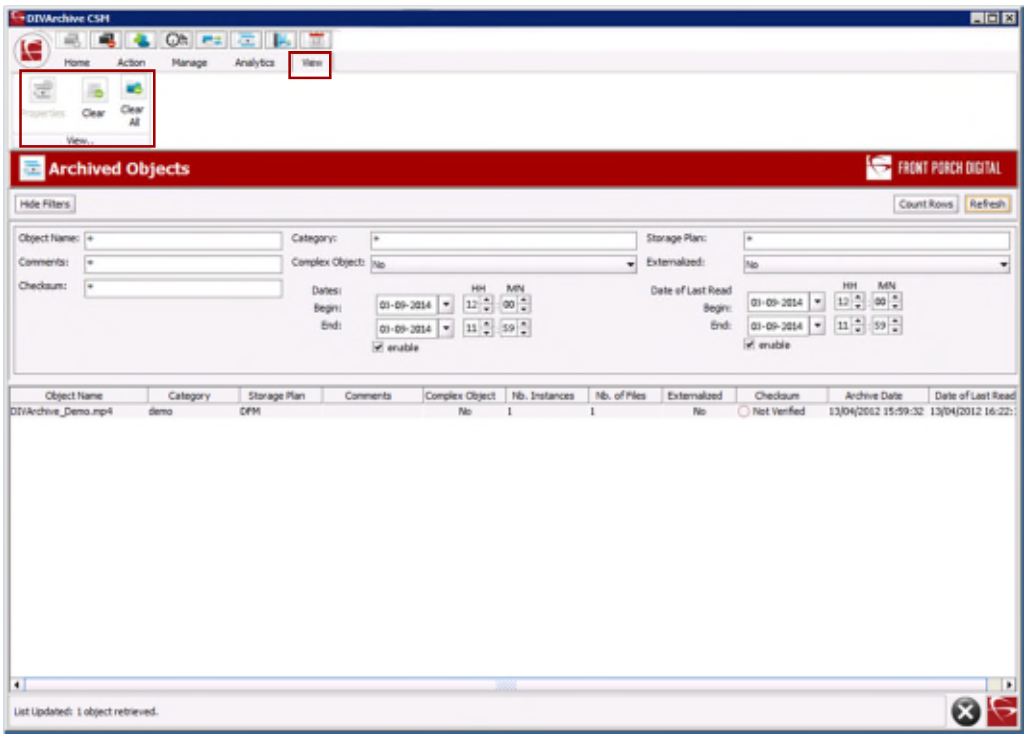


6.6.23 View Tab: Properties, Clear, and Clear All

The **View Tab** may be used to view the properties of selected items in other Control GUI screens. Highlight the items (*object, system component, etc.*) in the original screen and click on the **View Tab** and then **Properties Button**.

The **Clear** and **Clear All Buttons** on the **View Tab** are used to clear one or more requests, errors, warnings, etc. from the appropriate screens.

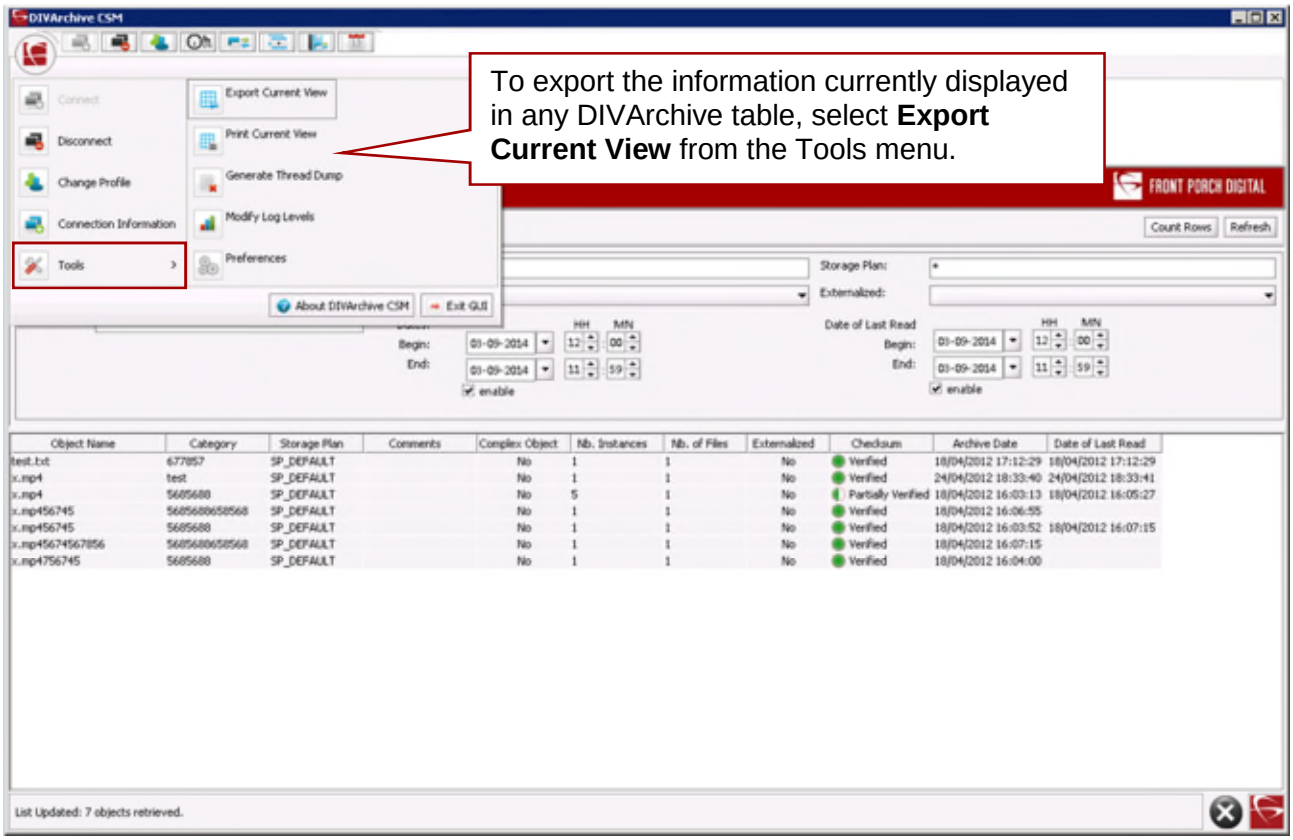
Figure 178: Control GUI View Tab



6.7 Exporting the Current View

To export the information currently displayed in any Control GUI view, select **Export Current View** from the **Start Button**, then **Tools** menu.

Figure 179: Control GUI – Tools Menu – Export Current View



In the file save dialog box that appears, select an existing file or specify the name of a new file that will receive the information in the currently displayed table.

Use the following procedure to save and then view the events in a spreadsheet such as Excel:

1. Enter the extension **`.csv`** (*Comma Separated Value file extension*) after your filename in the File Name box.
2. Indicate your default column separator in Excel or other spreadsheet application.
   a) It is not recommended to choose a letter (a....x), or a number (0 to n) as a separator as it may cause unexpected results.

The content of the exported view will depend upon the current filter selection:

- If the filters have been modified since the last query, and the **Refresh Button** has not been clicked, the exported log will not represent the current filter selection.
- If the table in the **Detailed View Pane** is empty when the view is exported, the destination file will contain nothing but two lines indicating the current filter.

After the export is complete, the file may be opened and viewed using Microsoft Excel (*or another **`.csv`** compatible spreadsheet program*).

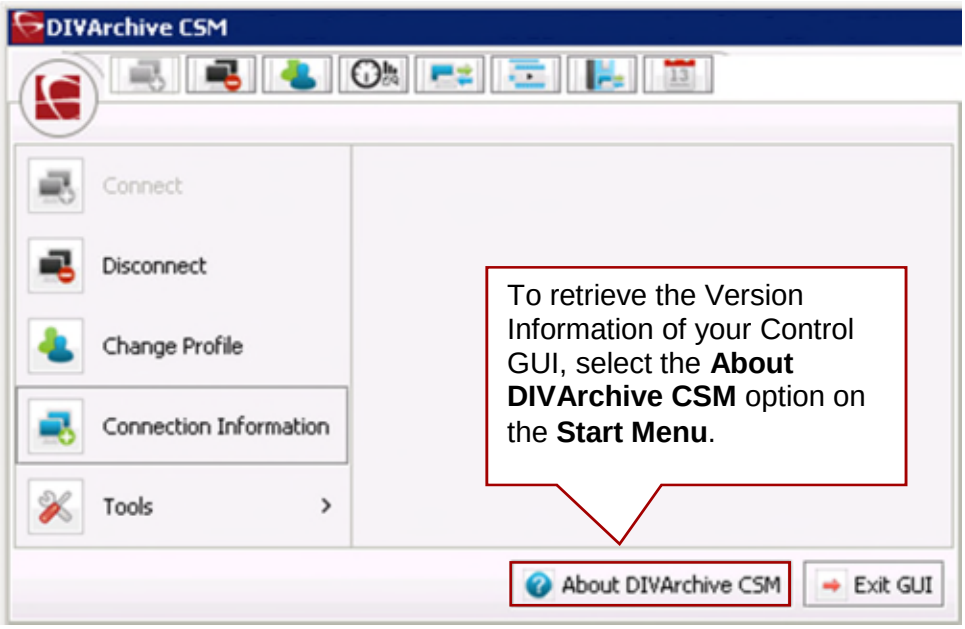
Exporting of tables is available for all views in the Control GUI **except**:

- Home Tab: Manager
- Home Tab: Actors
- Home Tab: Robot Managers
- Home Tab: Libraries
- Home Tab: Drives
- Home Tab: Disks
- Home Tab: Sources/Destinations
- Action Tab: out
- Manage Tab: Logged Requests

Export **is** available for the **Home Tab Tapes View**.

6.8 DIVArchive Version Information

Figure 180: Control GUI – Start Menu – About DIVArchive Button



6.9 Control GUI Connection Information

Figure 181: Control GUI – Start Menu – Connection Information

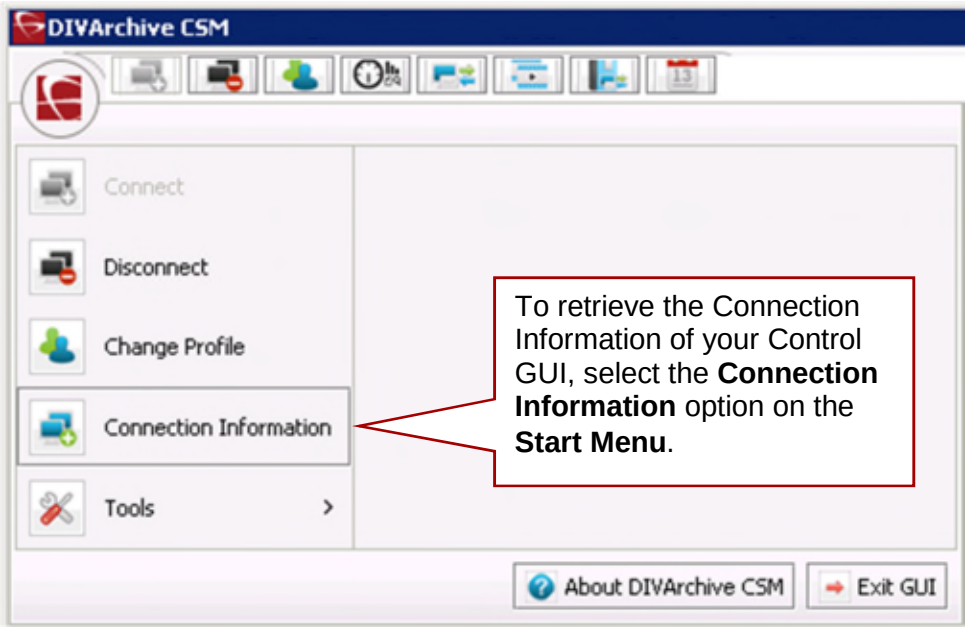
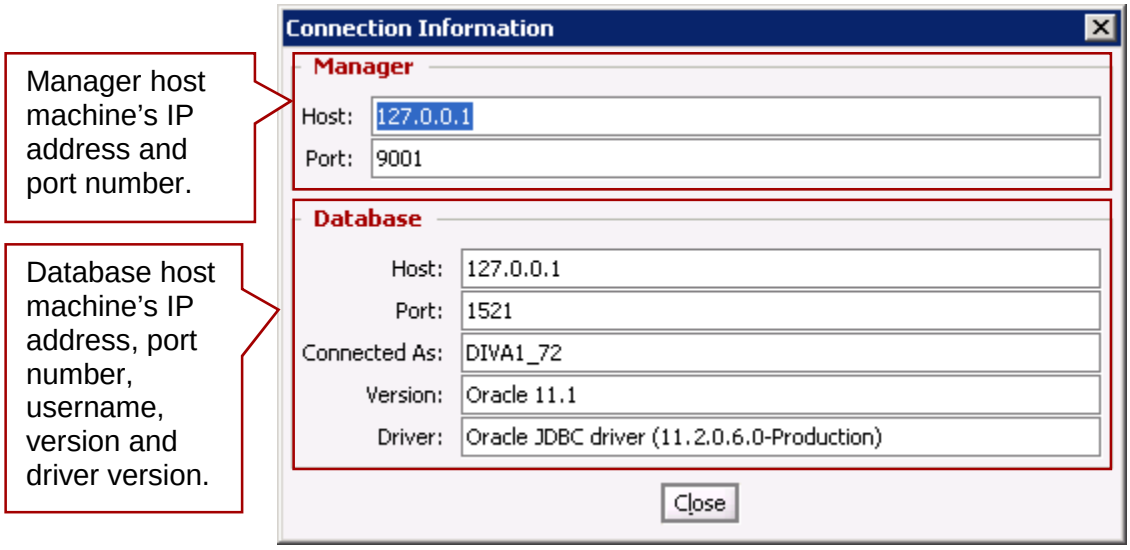


Figure 182: Control GUI – Start Menu – Connection Information Window

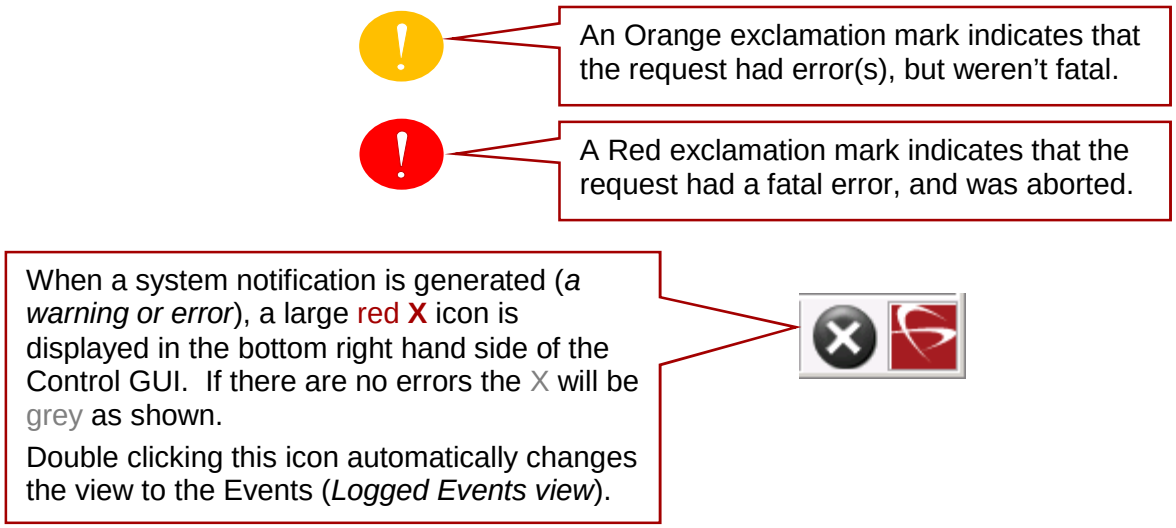


7 Monitoring the DIVArchive System

7.1 Overview

During normal DIVArchive operations, each operator should periodically monitor the **Manager Current Requests** window's **Errors** column for warnings and/or errors.

Figure 183: Control GUI – Warning and Error Indicators



7.2 Warnings

A warning status indicated on a request signifies that an unexpected error occurred during the requests execution; however the request was still completed.

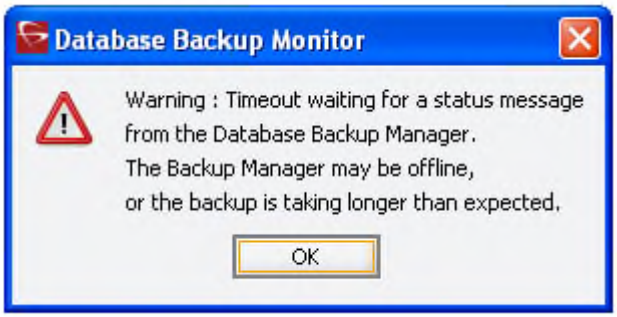
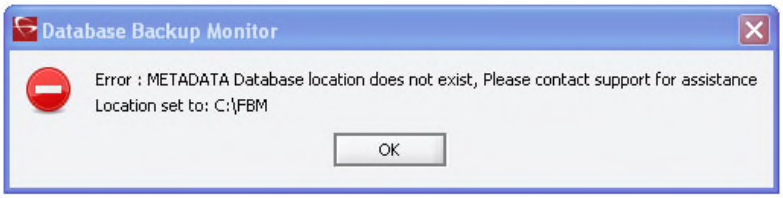
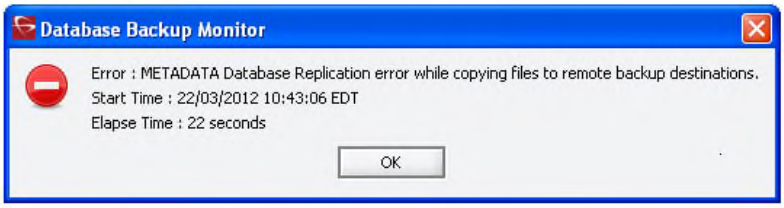
Example Scenarios:

- An I/O error occurred when reading an object from tape. However, there was a second instance of the object on another tape. DIVArchive attempted to use the second instance and this time the object transferred successfully. The tape from the first restore attempt should be investigated. If multiple events of this type occur across multiple tapes, establish whether they all relate to a specific tape drive. If the errors are severe enough, DIVArchive will automatically mark the drive **Out of Order**.
- An object is being transferred to a Disk Array. Since multiple disks can be assigned to an array, an unexpected I/O error may have occurred with one of the disks in the array. DIVArchive automatically selects another disk from the Array to transfer the object to, and this attempt is successful. The disk where the I/O error occurred will be marked **Out of Order** by DIVArchive and not used again. The offline disk should be examined for the cause of the I/O error.
- An object is being archived to tape and a write error occurs with the selected tape. DIVArchive attempts to use another tape and drive to fulfill the request. The tape from the first write attempt will be marked read-only, and not used for additional archive requests.

7.3 DIVArchive Backup Service Warnings and Notifications

The DIVArchive Backup Service notifies Manager on all backup errors and warnings. Manager broadcasts the backup errors and warnings to all connected DIVArchive Control GUIs and records the same in the Manager Events Log. The following are the different warning and error notifications shown on the Control GUIs.

Table 40: DIVArchive Backup Service Error and Warning Pop-up Windows

Severity	Message Window / Event Log Entry	Cause
Warning		DIVArchive Manager timed out waiting for a connection from the DIVArchive Backup Service because the Backup service failed to start. If the Metadata Database is enabled, Manager expects a connection from the Backup Service within 15 minutes (*configurable*) from the time that Manager started running.
Error		Metadata Database Location is not configured or invalid.
Error		This error notification is shown when copying the Metadata Database Files to any of the remote backup destinations fails.
Error		This error notification is shown when the Oracle Database Backup fails or Copying Oracle Backups to a remote backup system fails.

Users should have an elevated awareness of error messages from the Backup Service. Contact your Oracle Support Specialist for assistance when necessary.

8 Operational Boundaries

8.1 Number of Manager Connections

The number of connections to the DIVArchive Manager is limited by the Manager and set in the Manager Configuration File. The default configuration limit is 200. This includes connections to GUIs, Actors and all API clients. Once the configured limit is reached, the API will not allow additional connections to be created.

Refer to the `manager.conf` file for additional information.

8.2 Number of Simultaneous Manager Requests

The maximum number of simultaneous requests processed by the Manager is configurable in the **`manager.conf`** file through the setting of the **`DIVAMANGER_MAX_SIMULTANEOUS_REQUESTS`** parameter. The default value has been raised from 200 to 500 in DIVArchive 7.3. The maximum number has been verified up to 2000. Additional simultaneous requests beyond the value set in this parameter will be rejected by the Manager.

8.3 Number of API Tasks

The number of API tasks that will be accepted to the API Processing Queue is configurable in the **`manager.conf`** file through the setting of the **`DIVAMANAGER_API_TASK_QUEUE_SIZE`** parameter. The default value is 2000 and DIVArchive 7.3 has been verified at this value. If the queue is full, subsequent commands will be rejected.

8.4 Recommended API Connection Usage

It is recommended that a new connection between the Manager and an API client **NOT** be created for each request or command sent to the Manager. Whenever possible, allow the connection to remain open for the lifetime of the session or application.

8.5 List of Special Authorized Characters in DIVArchive

Many of the requests require alpha numeric text parameters. Special characters may be used in these fields as defined in the following table. The request will be rejected if an invalid special character is used.

Table 41: List of Special Authorized Characters in DIVArchive

Characters / Fields	Name	Category	Source	Media	Path	File	Comments	Options
~	✓	✓	✓	✓	✓	✓	✓	✓
`	✓	✓	✓	✓	✓	✓	✓	✓
!	✓	✓	✓	✓	✓	✓	✓	✓
@	✓	✓	✓	✓	✓	✓	✓	✓
#	✓	✓	✓	✓	✓	✓	✓	✓
$	✓	✓	✓	✓	✓	✓	✓	✓
%	✓	✓	✓	✓	✓	✓	✓	✓
^	✓	✓	✓	✓	✓	✓	✓	✓
&	✓	✓	✓	✓	✓	✓	✓	NO
*	✓	✓	✓	✓	NO	✓	✓	✓
(	✓	✓	✓	✓	✓	✓	✓	✓
)	✓	✓	✓	✓	✓	✓	✓	✓
_	✓	✓	✓	✓	✓	✓	✓	✓
-	✓	✓	✓	✓	✓	✓	✓	✓
+	✓	✓	✓	✓	✓	✓	✓	✓
=	✓	✓	✓	✓	✓	✓	✓	✓
|	✓	✓	✓	✓	NO	✓	✓	✓
\	✓	✓	✓	✓	NO	✓	✓	✓
}	✓	✓	✓	✓	✓	✓	✓	✓

Characters / Fields	Name	Category	Source	Media	Path	File	Comments	Options
]	✓	✓	✓	✓	✓	✓	✓	✓
{	✓	✓	✓	✓	✓	✓	✓	✓
[	✓	✓	✓	✓	✓	✓	✓	✓
:	✓	✓	✓	✓	NO	✓	✓	✓
;	✓	✓	✓	✓	✓(1)	✓	✓	✓
“	✓	✓	✓	✓	NO	✓	✓	NO
‘	✓	✓	NO	NO	✓(1)	✓	✓	✓
<	✓	✓	✓	✓	NO	✓	✓	NO
,	✓	✓	✓	✓	✓(1)	✓	✓	✓
>	✓	✓	✓	✓	NO	✓	✓	✓
.	✓	✓	✓	✓	NO	✓	✓	✓
?	✓	✓	✓	✓	NO	✓	✓	✓
/	✓	✓	✓	✓	NO	✓	✓	✓
Space	✓	✓	✓	✓	NO	✓	✓	✓

NOTE: In a Windows environment, the following File/Folder Names restrictions apply:

- (1) Depends upon file system restrictions.
- File/Folder names cannot consist solely of one or more Space(***s***).
- File/Folder names cannot contain a double-quote (i.e., “).

8.6 Maximum Number of Characters Allowed

The maximum number of characters that may be used for request parameters is shown by the following table. If these limits are exceeded, the request will be rejected.

Table 42: Maximum Number of Characters Allowed

	Name	Category	Source	Media	Path and Filename	Comments	Options
Maximum number of characters	192	96	96	96	1536	4000	768

8.7 File Path Limitations

DIVArchive cannot open or create files on a Windows filesystem if their absolute path exceeds 260 characters. A local path is structured in the following order and terminated with a **NUL** character:

Drive_Letter:\Component_Name\Component_Name\filename.extension

Examples:

- Generic

  D:\Some_256-Character_Path_String<NUL>

- Actor Executable

  D:\diva\71\Program\Actor\bin\DIVArchive.exe

- Manager Configuration

  D:\diva\71\Program\conf\manager\manager.conf

The **<NUL>** character used in the examples represents the invisible terminating null character for the current system code page and need not be typed in. The **<** and **>** characters are used in the examples for clarity only and cannot be part of a valid path string.

9 Frequently Asked Questions

In general, refer to the documentation for the specific DIVArchive component for Frequently Asked Questions about that particular component. Below are some basic examples from those documents.

9.1 How do I access the system in Engineering Mode?

Answer: Please contact Oracle Support to access the system in Engineering Mode. Engineering Mode is accessible for Oracle Support personnel only to avoid accidental misconfiguration of the system, which could possibly result in degradation of DIVArchive operations.

9.2 What is the Administrator Login and Password?

Answer: Please contact Oracle Support for this information.

9.3 What should I do if the Customer Information Collection Tool does not work?

Answer: Check to make sure that **`CygWin`** and the **`7z`** Archive programs are installed correctly.

If the **`CygWin`** and/or the **`7z`** programs are not installed the Customer Information Collection tool will stop running and display one of the following error messages:

- Error: **`Cygwin`** environment could not be located at "...". Please check the configuration or reinstall **`Cygwin`** environment if necessary.
- Error: **`7Z`** archiver could not be located at "...". Please check the configuration or reinstall **`7Z`** archiver if necessary.

These programs are readily accessible from the World Wide Web at:

- http://www.7-zip.org/
- http://www.cygwin.com/

9.4 How often are metrics updated?

Answer: Data Metrics are calculated and updated every hour through an automated database job that runs in the background.

9.5 What should be done if SPM is not working as desired?

Answer:

- Check the SPM configuration. Refer to the *Oracle DIVArchive Storage Plan Manager (SPM) Guide* in the DIVArchive Additional Features Documentation library for details.
- Check the SPM Actions Panel in the GUI to make sure that the Actions are changing states (*in process, completed, failed, etc.*).
- Check the SPM logs for new log entries.

- Collect the system logs and database dumps using the Customer Information Collection tool and submit it to the Oracle Support department.
    - Contact Oracle Support for assistance using the Customer Information Collection Tool.

9.6 What is the export XML file compatibility?

Answer: The exported XML, when generated, will be able to be imported into the version of DIVArchive that it was exported from, and later versions of DIVArchive. DIVArchive allows more than one set of tapes (*spanned or not*) to be exported to and imported from a single file.

9.7 Should I keep all Windows systems up to date with critical updates?

Answer: Oracle recommends applying all critical updates to machines running Windows operating systems.

9.8 Should I keep all Windows systems up to date with optional updates?

Answer: Optional Windows updates are not necessary in the DIVArchive environment; however the decision to apply optional updates is left to your System Administrator.

9.9 Are there any Windows updates that should not be installed?

Answer: Oracle is not currently aware of any Windows updates that impact DIVArchive functionality or operations.

9.10 Should I be restarting the servers with any frequency?

Answer: No. Restarting the servers will cause downtime for the system and possibly cause data corruption if a process is executing when the server is restarted. Only restart a server when absolutely necessary and perform a normal Windows shutdown (*do not just power off the machine unless absolutely necessary*).

9.11 Should I be restarting any services with any frequency?

Answer: No. Restarting the services will cause downtime for the system and possibly cause data corruption if a process is executing when the service is restarted. Only restart a service when absolutely necessary.

9.12 Should I be restarting any vendor applications with any frequency?

Answer: No - Only restart a vendor application when absolutely necessary.

9.13 Should I always update vendor applications to the latest version?

Answer: No - Only update vendor applications if you want to benefit from new functionality or for bug fixes.

9.14 What is the recommended frequency of database backups?

Answer: The DIVArchive database automatically backs up every fifteen minutes.

9.15 Is there a database backup application that is recommended?

Answer: A database backup service is provided in the DIVArchive package. You are welcome to use your own backup software as an additional security under the condition that you only backup the DIVArchive database backup files (*in H:\oraback*) and not the database itself. Backing up the database directly is forbidden (*for example using Oracle RMAN or other non-DIVArchive database backup applications*). Backing up the database directly with another program may interfere with the DIVArchive database backup service. This may render database restoration impossible using the embedded DIVArchive restore utility and could possibly result in data losses for which Oracle will accept no responsibility.

9.16 Where are the backup files located?

Answer: The database backup files are located on the Main Manager machine in the H:\oraback folder. The files are synched to the Backup Manager and an Actor in the H:\oraback\mgr1 folder.

9.17 Are there iterated versions of the database backup, and if so, how many are retained?

Answer: The backup files are retained for the last ten days. The retention period is configurable for the database backup files in the DIVArchive Backup Service configuration file. Contact your Oracle Support Specialist for assistance.

9.18 Where are vendor-specific logs located?

Answer: The vendor-specific log files are located in the **`C:\%DIVA_HOME%\Program\log`** folder.

9.19 How far back in time do the logs go?

Answer: The log files are retained as follows:

- Manager, DIVAnet Access Gateway : 50 hours
- Actor, Robot Manager, Storage Plan Manager, Avid Transfer Manager Communicator, Avid Archive Manager Communicator : 10 days
- Drop Folder Monitor : variable (based on size)

The log file retention period is configurable in the DIVArchive configuration file. Contact your Oracle Support Specialist for more information.

9.20 What is the suggested frequency of log backups?

Answer: The log files do not require backing up.

9.21 Are there any special considerations I should know about regarding maintenance and backup of vendor servers and systems?

Answer: Oracle only supports the DIVArchive software. You should contact the server supplier for any hardware issue. Oracle should be kept in the loop for any issues on the DIVArchive solution (*loss of a RAID disk, failover to the backup manager, and so on*).

9.22 Are there any special considerations I should know about related to recovering from a server failure when the server is part of the vendor solution?

Answer: As mentioned above, Oracle should be kept in the loop if issues are encountered.

APPENDIX

A1 Limitations of Repack or Verify Tape Requests with Checksum Workflows in DIVArchive 7.3 Release

The repack request will fail if the tape contains any corrupted objects and/or the object fails checksum verification. The operator should manually resolve the conflict before performing the repack. Note that repack of WORM Media is not automatic. Manual repack is available for WORM Media; however the space is not recoverable after repack is complete.

During Repack or Verify Tape requests, a checksum will not be generated for any spanned objects. The Actor will identify any spanned files and the Manager will not attempt to verify them. A warning event will be displayed stating that a checksum was not generated and/or verified for the spanned content. In this case the repack operation will not be aborted, but the object instance will be marked as Not Verified.