

Oracle® DIVArchive

Database User's Guide

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Table of Contents

1 INTRODUCTION	1
1.1 DOCUMENT PURPOSE AND SCOPE	1
1.2 DOCUMENT CONVENTIONS	1
1.3 DEFINITIONS, ACRONYMS, AND SPECIAL TERMS.....	2
1.4 SYSTEM OVERVIEW.....	3
1.5 DIVARCHIVE 7.4 ENHANCEMENTS.....	3
1.6 COMPLEX OBJECTS.....	4
1.7 DIVARCHIVE BACKUP SERVICE.....	4
1.7.1 Oracle Database	5
1.7.2 Metadata Database.....	6
1.8 USING THE 7Z TOOL TO EXTRACT THE ISO FILE	6
2 DIVARCHIVE ORACLE DATABASE INSTALLATION AND CONFIGURATION.....	7
2.1 UNINSTALLING THE EXISTING DIVARCHIVE ORACLE DATABASE IN WINDOWS (IF REQUIRED)	7
2.1.1 Uninstalling the Database in Linux.....	8
2.2 INSTALLING THE DIVARCHIVE ORACLE DATABASE IN WINDOWS.....	8
2.3 INSTALLING THE DIVARCHIVE ORACLE DATABASE IN LINUX	11
2.4 ORACLE STATISTICS INSTALLATION AND CONFIGURATION.....	16
2.5 USING THE CREATE_DIVA_USER SCRIPT.....	17
3 DIVARCHIVE DATABASE MIGRATION	18
3.1 ORACLE 9 TO ORACLE 11 MIGRATION PROCEDURE.....	18
3.1.1 Target Environment.....	18
3.1.2 Prerequisites	18
3.1.3 Important Notes	18
3.1.4 Steps to be conducted on the source machine (Oracle 9 DIVArchive Manager).....	18
3.1.4.1 Exporting DIVArchive Database Dump File from the Source Machine	18
3.1.4.2 Exporting Oracle DIVArchive Storage Plan Manager Data from the Source Machine (SPM 5.5 and 5.6 only)	19
3.1.5 Steps to be conducted on the Target Machine (Oracle 11 DIVArchive Manager)	19
3.1.5.1 Uninstalling Oracle on the Target Machine	19
3.1.5.2 Installing Oracle 11g on the Target Machine	20
3.1.6 Importing DIVArchive Database Dump File to the target machine	20
3.1.6.1 Importing DIVArchive Storage Plan Manager Data (SPM 5.5 and 5.6 only)	21
3.2 ORACLE 11.1 TO ORACLE 11.2 MIGRATION PROCEDURE	21
3.2.1 Target Environment.....	21
3.2.2 Prerequisites	21

3.2.3	<i>Important Notes</i>	22
3.2.4	<i>Steps to be conducted on the Source Machine (Oracle 11.1 DIVArchive Manager)</i>	22
3.2.4.1	Exporting DIVArchive Manager and File System Data from the Source Machine.....	22
3.2.4.2	Steps to be conducted on the target machine (Oracle 11.2 DIVArchive Manager)	22
3.2.5	<i>Installing Oracle 11.2 on the Target Machine</i>	23
3.2.5.1	Importing DIVArchive Database Dump File to the target machine	23
4	DIVARCHIVE BACKUP SERVICE INSTALLATION AND CONFIGURATION.....	24
4.1	DIVARCHIVE BACKUP SERVICE PREREQUISITES	25
4.2	DIVARCHIVE BACKUP SERVICE CONFIGURATION	25
4.3	INSTALLING THE DIVARCHIVE BACKUP SERVICE	33
4.4	RSYNC SERVICE INSTALLATION AND MODULE CONFIGURATION	34
5	OPERATIONS	36
5.1	METADATA DATABASE CONFIGURATION	36
5.2	METADATA DATABASE SIZING	36
5.3	RECOVERY WINDOW	37
5.4	BACKUP CLEAN-UP.....	37
5.5	BACKUP INTERVAL OVERRUN.....	38
5.6	RECOMMENDED PRACTICES	38
5.7	MONITORING THE DIVARCHIVE BACKUP SERVICE	39
5.7.1	<i>Minimum Disk Space Monitoring</i>	44
5.7.2	<i>Email Notifications</i>	46
5.8	DIVARCHIVE BACKUP SERVICE STATUS COMMAND ENHANCEMENTS	49
5.8.1	<i>The Backup Service is Running Normally</i>	49
5.8.2	<i>The Backup Service is Currently Stopped</i>	50
5.8.3	<i>The Backup Service Failed to Start</i>	51
5.9	FAILURE SCENARIOS AND RECOVERY STEPS	52
5.9.1	<i>Non Failover Scenarios</i>	52
5.9.2	<i>Failover Scenarios</i>	53
5.9.3	<i>Failover Procedure</i>	55
6	TROUBLESHOOTING	60
6.1	METADATA BACKUP FAILURE SCENARIOS	60
6.2	DIVARCHIVE MANAGER WILL NOT START.	66
6.3	THE DIVARCHIVE BACKUP SERVICE WILL NOT START.	66
7	FREQUENTLY ASKED QUESTIONS	67
7.1	HOW DO I CHECK THE STATUS OF THE DIVARCHIVE BACKUP SERVICE?.....	67
7.2	HOW DO I FAILOVER TO A BACKUP SYSTEM WHEN MY MAIN MANAGER SYSTEM HAS CRASHED?	67

7.3	HOW DO I RECOVER WHEN THE METADATA FILE OF A COMPLEX OBJECT IS CORRUPTED IN THE MAIN MANAGER SYSTEM?	67
7.4	HOW DO I RECOVER WHEN THE METADATA FILE OF A COMPLEX OBJECT IS CORRUPTED IN THE BACKUP MANAGER SYSTEM?	67
7.5	WHEN A METADATA FILE IS MANUALLY DELETED FROM MAIN MANAGER SYSTEM, IS IT ALSO DELETED FROM ALL BACKUP SYSTEMS?	67
7.6	HOW DO I RECOVER WHEN THE METADATA FILE OF A COMPLEX OBJECT IS MANUALLY DELETED IN MAIN MANAGER SYSTEM?	68
7.7	HOW DO I RECOVER WHEN THE METADATA FILE OF A COMPLEX OBJECT IS LOST ON THE MAIN SYSTEM AND ALL BACKUP SYSTEMS?	68
7.8	HOW DO I RECOVER WHEN THE BACKUP DISK CRASHES OR GETS CORRUPTED ON THE MAIN MANAGER SYSTEM?	68
7.9	HOW DO I CONFIGURE A FULL BACKUP TO START ON A BACKUP SERVICE START-UP?	68
7.10	HOW DO I LOCATE THE METADATA OF A COMPLEX OBJECT INSIDE METADATA DATABASE?	68
7.11	HOW DOES THE METADATA DATABASE MAINTAIN ITS RECOVERY WINDOW WHEN A COMPLEX OBJECT IS DELETED?	68
7.12	HOW DO I TURN OFF BACKUP SERVICE NOTIFICATIONS ON THE GUI?	68
7.13	CAN THE DIVARCHIVE MANAGER AND ORACLE DATABASE BE INSTALLED ON SEPARATE SERVERS?	68
7.14	DOES THE RECOVERY WINDOW APPLY TO BOTH ORACLE BACKUPS AND METADATA BACKUPS?	69
7.15	HOW DO I ESTIMATE THE SIZE FOR THE METADATA DATABASE LOCATION?	69
7.16	WHERE DO I CONFIGURE THE METADATA DATABASE LOCATION?	69
7.17	WHAT INFORMATION IS STORED IN THIS METADATA DATABASE (MDB)?	69
7.18	IS THIS INFORMATION IRREPLACEABLE/MISSION-CRITICAL?	69
7.19	WHY IS THIS INFORMATION NOT BEING STORED IN THE EXISTING ORACLE DATABASE?	69
7.20	WHAT ARE THE SPACE REQUIREMENTS FOR THIS DATABASE/DATA? DO THEY DEPEND ON THE QUANTITY OF OBJECTS, THE COMPLEXITY OF THOSE OBJECTS, OR SOMETHING ELSE?	69
7.21	WHAT BECOMES OF A CUSTOMER WITH, FOR EXAMPLE, 1M OBJECTS, EACH WITH 100K FILES?	69
7.22	WHAT ARE THE CONSEQUENCES OF THIS DATABASE BEING INOPERABLE, CORRUPT, OR MISSING; DATA LOSS, PERFORMANCE LOSS, OR SOMETHING ELSE?	70
7.23	WHAT ARE THE CONSEQUENCES OF THIS DATABASE RUNNING OUT OF AVAILABLE STORAGE SPACE; DATA LOSS, PERFORMANCE LOSS, OR SOMETHING ELSE?	70
7.24	WHAT TOOLS EXIST FOR TESTING/VERIFYING THE INTEGRITY OF THIS DATABASE; ARE THEY AUTOMATIC AND/OR CAN THEY BE INVOKED MANUALLY?	70
7.25	WHAT TOOLS EXIST FOR BACKING UP THIS DATABASE; ARE THEY AUTOMATIC AND/OR CAN THEY BE INVOKED MANUALLY?	70
7.26	WHAT TOOLS EXIST FOR RECOVERING THIS DATABASE IN THE EVENT OF LOSS/CORRUPTION, WHAT IS THE PROCEDURE TO EXECUTE RECOVERY AND IS ANY OF THE RECOVERY AUTOMATIC?	70
7.27	IS THE STORAGE LOCATION OF THE “LIVE” DATABASE PERFORMANCE-CRITICAL OR SPACE-CRITICAL?	70
7.28	CAN THE LOCATION OF THE BACKUPS OF THIS DATABASE BE CONFIGURED?	70
APPENDIX.....		71
A1	DIVARCHIVE BACKUP SERVICE WINDOWS CONFIGURATION FILE	71

A2	DIVARCHIVE BACKUP SERVICE LINUX CONFIGURATION FILE	82
A3	BACKUP SERVICE STATUS ERROR AND WARNING MESSAGES.....	93

Tables Index

Table 1: Definitions, Acronyms, and Special Terms	2
Table 2: DIVArchive Backup Service Parameters	25
Table 3: Configuration Utility Parameters.....	26
Table 4: Default Backup Service Configuration File Parameters	29
Table 5: dbbackup.bat Command Line Options	33
Table 6: dbbackup.bat Command Line Commands	34
Table 7: DIVArchive Backup Service Errors and Warnings	40
Table 8: Non Failover Scenarios and Recovery Actions.....	52
Table 9: Failover Scenarios and Recovery Actions	53
Table 10: restore.bat Command Definitions.....	57
Table 11: Typical DIVArchive Backup Configuration	60
Table 12: Failure Scenarios, Causes and Resolutions	61

Figures Index

Figure 1: Database Engine Installation – Password Required.....	8
Figure 2: Database Engine Installation Complete	9
Figure 3: Install Database Command Window – Mount Points.....	9
Figure 4: Install Database Command Window – Use Mount Points (Yes)	10
Figure 5: Install Database Command Window – No Mount Points Available	10
Figure 6: DIVArchive Installation Screen.....	24
Figure 7: Configuration Utility - Manager Tab – Metadata Database Parameters.....	27
Figure 8: Configuration Utility – Manager Tab – Email Notifications	29
Figure 9: DIVArchive Control GUI Displaying Error Window.....	39
Figure 10: Logged Events Database Displaying Backup Service Errors	40
Figure 11: Control GUI Popup Message Window – Errors and Warnings.....	42
Figure 12: DIVArchive Control GUI – Analytics Tab Logged Events.....	43
Figure 13: DIVArchive Control GUI – Analytics Tab Logged Events (Filtered)	44
Figure 14: Manager Storage Minimum Threshold Dialog Window.....	45
Figure 15: Configuration Utility – Manager Tab – Email Notifications	47

Figure 16: Test Email Message Sent by Manager.....	48
Figure 17: Example Error Email Message.....	48
Figure 18: Example Control GUI Events Log	49
Figure 19: Example Error Message Popup Dialog	49
Figure 20: status Option Output for a Normal Running Backup Service.....	50
Figure 21: status Option Output for a Stopped Backup Service	51
Figure 22: status Option Output When the Backup Service Failed to Start	51
Figure 23: Typical DIVArchive System Configuration	55
Figure 24: Main Manager Offline.....	56
Figure 25: System Configuration after Failover Recovery Procedure	59

1 Introduction

1.1 Document Purpose and Scope

This guide outlines installation of the Oracle DIVArchive Database, DIVArchive Database Migration and the operational guidelines for the Oracle DIVArchive 7.4 Backup Service. Included are installation, configuration, start-up, and shut-down procedures for the DIVArchive Backup Service in a typical Oracle DIVArchive Suite 7.4 environment. The document also includes details on controlling and monitoring aspects of the DIVArchive Backup Service using the DIVArchive Control GUI and Configuration Utility.

Important: Refer to the Oracle DIVArchive Supported Environments Guide in the Oracle DIVArchive 7.4 Core Documentation library to confirm disk partitioning and recommended block sizes before proceeding.

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 r 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.
- **CYGWIN_HOME**: The Root Path on the file system where CYGWIN is installed.
- **ORACLE_HOME**: The location of the Oracle Database installation.

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
AXF	Archive Exchange Format (www.openaxf.org). This is the format with which Oracle DIVArchive Actor will start writing DIVArchive Objects to tapes and disks beginning with DIVArchive 7.0.
Complex Object	By default, a DIVArchive Object with more than 10,000 files is considered a Complex Object. The number of files to qualify an object as a Complex Object is configurable. All Complex Objects are created in AXF format.
Component	File inside of a DIVArchive object.
CYGWIN	A collection of tools which provide a Linux look-and-feel environment for Windows. The tool collection can be obtained from http://www.cygwin.com/ .
DIVArchive Oracle Database	Standard Oracle Database Installation package release by Oracle.
GUI	Graphical User Interface.
ISO	An ISO image is an archive file of an optical disc, a type of disk image composed of the data contents of every written sector of an optical disc, including the optical disc file system.
Main Manager System / Manager System	This is the Oracle DIVArchive System where the Oracle DIVArchive Manager and Backup Service are installed and running.
Metadata Database	The Metadata Database is the location where the Metadata for components of Complex Objects are stored in the DIVArchive System.
Non-Complex Object	By default, DIVArchive Objects with 10,000 files or less are considered Non-Complex Objects. The Maximum number of files a Non-Complex Object can hold is configurable.
SQL	Structured Query Language; used to query a database directly.
Remote Backup System / Backup System	This is the system where copies of the Oracle Database Backups and Metadata Files in the Metadata Database are replicated. This system could be either an Actor Server or a dedicated Backup Server.
RMAN	Oracle Recovery Manager (<i>RMAN</i>) is a command-line and Oracle Enterprise Manager based tool. It is the Oracle-preferred method for efficiently backing up and recovering an Oracle database.

Term	Definition
RSYNC	Utility that provides fast incremental file transfer (http://rsync.samba.org).
7zip	Windows utility for manipulating archives. Fully supported formats are 7z, ISO, ZIP, GZIP, BZIP2, and TAR. Additional formats can be unpacked only.

1.4 System Overview

Oracle DIVArchive 7.4 supports system installations in the Oracle Linux 7 x86_64 and later environment. Oracle Linux enables selection of specific languages during system installation, however, the main Linux installation must be in English. To use a language other than English (after installation) you must create a user configured for the language. All Windows installations must be in English only. The installation of the database and backup service is different in the Linux environment and is described in 2.3.

The DIVArchive Oracle Database and Backup Service components are installed as an integral part of the standard DIVArchive system installation. The components are typically installed on the same server as the Oracle DIVArchive Manager.

The Oracle Database is backed up using the RMAN and RSYNC components that are distributed as part of the Oracle Database package.

Scheduled backups using the DIVArchive Backup Service are configured in its configuration file. The DIVArchive Backup Service manages and monitors the entire backup process.

DIVArchive uses a Metadata Database to support Complex Object workflows. The DIVArchive Backup Service ensures reliability and monitoring of both the Oracle Database backups and Metadata Database backups.

DIVArchive 7.4 in a Windows environment only supports DIVA Oracle database package `203211-010-Database_2-3-4_Oracle_11-2-0-4-7_Windows_64-bit.iso`.

DIVArchive 7.4 in a Linux environment only supports DIVA Oracle database package `OracleDivaDB_3-0-0_12_1_0_2_0_SE2_OEL7_x86_64.sh`.

1.5 DIVArchive 7.4 Enhancements

Oracle DIVArchive 7.4 supports system installations in the Oracle Linux 7 x86_64 and later environment. All batch files (`.bat`) have corresponding shell scripts (`.sh`) in Linux. You must substitute Windows paths with Linux paths when operating on Linux. For example, the Windows path: `C:\DIVA\Program` will be `/home/diva/DIVA/Program` when running under Linux.

Note: Linux commands, paths and file names are case-sensitive.

The JDBC Thin Driver enables specifying the Oracle Service Name in lieu of the Oracle SID setting in the Manager configuration file. If both the service name and SID are specified, the Oracle service name takes precedence. The setting is identified using the `DIVAMANAGER_DBSERVICENAME` parameter in the Manager configuration file.

DIVArchive passwords are no longer stored as plain text in the configuration files. All database password parameters have been removed from the Manager, Oracle DIVArchive Storage Plan Manager (SPM), DBBackup, and Migration Service configuration files.

The password file permissions are restricted to read-only permission for all operating system users and groups. Only the DIVArchive Administrator operating system user has permission to reset or change the password file.

When you create a user, DIVArchive creates a password file that DIVArchive services use in place of the configuration file parameters. The DIVArchive services (for example manager, SPM, DBBackup, migration, and so on) read the password from the file when the service starts. The services will fail to start if the password does not exist, the file is empty, or decryption fails. The Configuration Utility and Control GUI do not use the password file.

You use the new `-ORAPWD` command line switch with the `create_diva_user` (for example `create_diva_user -ORAPWD`) script to generate, or regenerate, a password file when you create a database user, to upgrade an existing customer, or to reset an existing password. When you use the `create_diva_user` script to create a database user, the passwords mentioned as arguments are encrypted and stored in the password file located in the `DIVA_HOME\Program\commonJava\pkpwd` folder in Windows, and located in the `/home/diva/DIVA/Program/commonJava/pkpwd` directory in Linux.

1.6 Complex Objects

By default, objects archived with greater than 1,000 files are considered Complex Objects. Complex Objects have Metadata stored in the Oracle Database and Metadata Database. The threshold on the number of files before an object is considered a Complex Object is configurable in the Manager Service Configuration File. Complex Objects are only capable of being stored in AXF format within the DIVArchive System. The Backup Service must be used to back up the Oracle Database and Metadata Database when Complex Object workflows are used.

1.7 DIVArchive Backup Service

The DIVArchive Backup Service is a component responsible for Database backups of the DIVArchive System. The Backup Service has a **Scheduler** function allowing customizable configuration of a backup schedule (*refer to Section 0 for recommended settings*). The DIVArchive Backup Service has features to configure separate backup intervals for the Oracle Database and Metadata Database.

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

Oracle Database Backups and Metadata Database Backups will be incrementally replicated to Remote Backup Systems by the DIVArchive Backup Service. It also supports replicating backups to multiple Remote Backup Systems.

The component resides in the following folders:

- `DIVA_HOME\Program\conf\db_backup.conf`
- `DIVA_HOME\Program\DBBackup`

The Backup Service monitors and sends backup status messages to the DIVArchive Manager. The DIVArchive Manager relays any error/warning messages received from the service to all connected Control GUIs listening for messages from the Manager. Manager records all events to the Events Log and the Control GUI displays the messages in a pop-up window and in the Events Log for review. If no Control GUIs are connected at the time of the error/warning, no error pop-ups will be displayed; error/warning pop-up windows are only displayed on connected Control GUIs.

Prior to DIVArchive 7.0, separate installation of Oracle Backup Scripts was required apart from DIVArchive System installation to perform Oracle Database backups. Starting with DIVArchive 7.0, there is no separate installation of Oracle Backup Scripts required. All Oracle Backup Scripts are now installed during the DIVArchive 7.4 installation and are located in the `DIVA_HOME\Program\DBBackup\rman\bin` folder.

The DIVArchive Backup Service will use these Oracle Backup Scripts to perform Oracle Database backups.

Note: 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 (*defined by the Recovery Period parameter*) has been reached.

1.7.1 Oracle Database

The DIVArchive Backup Service uses Oracle's RMAN Database Backup Utility to generate Oracle Database Backups. Full and incremental backup files will be generated in the `DB_BACKUP_LOCATION` as defined in the configuration file.

The DIVArchive Backup Service generates a full database backup every 24 hours and an incremental backup every 15 minutes by default. The backup files are compressed with 7zip tool with the `.gz` extension. Refer to Section 4.1 for the list of prerequisites.

The Backup Service also incrementally replicates all the backup files to all configured `DB_BACKUP_REMOTE_DESTINATIONS` as set in the configuration file. All of the remote backup destinations must be RSYNC modules; refer to Section 0 for information on configuring an RSYNC module.

Note: It is recommended to have the same backup location on all Main and Remote Backup Destination Systems. That is, if the `DB_BACKUP_LOCATION` is set to `H:\oraback`, on the Main System, have the Backup Service copy the backups to the same location on all remote backup destination systems by configuring the RSYNC module to `H:\oraback\` on all remote backup destination systems. If the paths are different, the correct Oracle Backup Paths needs to be mentioned and update in the Oracle RMAN Backup Tool during failover. Refer to Section 5.9.3 for more details.

1.7.2 Metadata Database

The Metadata Database is a binary file in the file system. In order to support the Recovery Window for the Metadata Database, DIVArchive Backup Service uses the following technique:

Complex Object Metadata Files are created by the Manager in the **Metadata Database Path** configured in the Configuration Utility whenever a new Complex Object is archived.

By default, the DIVArchive Backup Service backs up Metadata Files inside the Metadata Database every 15 minutes. In this manner, the Metadata File is transferred to all Backup Systems shortly after creation so that file alterations do not influence the backup copies.

Note: If there is a failure backing up to one of the configured Backup Systems, the Backup Service will continue to retry the failed backup until all backups to all configured Backup Systems are successful. Metadata Files are not marked as being successfully backed up until the backup to all configured Backup Systems is successful.

During every Metadata Database backup, the Backup Service searches for any Complex Object Metadata Files that are not backed up and replicates them to all of the **FBM_BACKUP_REMOTE_DESTINATIONS** as configured in the configuration file. All of the Remote Backup Destinations must be RSYNC modules. Refer to Section 0 for information on configuring a RSYNC module.

Note: It is recommended to have the same Metadata Database Location on all Main and Remote Backup Destination Systems. That is, if the Metadata Database Location is set to `H:\metaback\`, on the Main System, have the Backup Service copy the Metadata Database backups to the same location on all remote backup destination systems by configuring the RSYNC module to `H:\metaback\` on all Remote Backup Destination Systems. If the paths are different, The Metadata Database Location needs to be updated in the Oracle Database after an Oracle Database Restore during failover. Refer to Section 5.9.3 for more details.

1.8 Using the 7z Tool to Extract the ISO File

In order to utilize the `.iso` file, it must be extracted. The 7z tool may be used to extract the `.iso` file from the command line using the following instructions:

1. Open a Command Line Window
 - a. Go to the Windows Start Menu then type `cmd` in the search box and hit Enter.
2. Navigate to the folder containing the `.iso` file.
3. Run the 7z utility to extract the file.

```
7z x <filename.iso> -o<destination_folder> -y
```

- `x` - Extracts the file while preserving the folder structure.
- `-o` - Specifies output directory.
 - Note there is no space between the switch and the folder path
- `-y` - Assumes YES to all questions during extraction.

Example:

```
7z x DIVArchiveDB.iso -oC:\ISO -y
```

2 DIVArchive Oracle Database Installation and Configuration

The DIVArchive Oracle Database is distributed as an `.iso` file and is available in only 64-bit versions. The installation process is identical for both versions and the version the user will install depends upon the machine's operating system.

The existing version of Oracle must be verified before upgrading a system to DIVArchive 7.4. The minimum version level for DIVArchive 7.4 is Oracle version 11.2. This can be verified by navigating to `c:\app\oracle` and opening the `VERSION.TXT` file. The Oracle version number is displayed in the file.

DIVArchive 7.4 in a Windows environment only supports DIVAOracle database package `203211-010-Database_2-3-4_Oracle_11-2-0-4-7_Windows_64-bit.iso`.

DIVArchive 7.4 in a Linux environment only supports DIVAOracle database package `OracleDivaDB_3-0-0_12_1_0_2_0_SE2_OEL7_x86_64.sh`.

2.1 Uninstalling the Existing DIVArchive Oracle Database in Windows (if required)

Before installing the new DIVArchive Oracle Database, it may be necessary to uninstall an existing database and database engine. If Oracle is already installed on the machine then the existing database and database engine need to be removed using the following procedure:

Important: Use the same DIVArchive Oracle Package used to install the database for uninstalling.

1. Stop all running DIVArchive services.
2. Export the existing database contents from the Windows Command Prompt using this command:

```
exp diva/lib5 file=c:\backup.dmp buffer=1048576 consistent=Y
statistics=none feedback=10000
```

- a. The existing database contents have now been exported to the file named `c:\backup.dmp`.
 - b. **Please make sure the export completed successfully before proceeding.**
3. Extract the original DIVArchive Database `.iso` that was used to perform the installation using the instructions in 0 (above) and all files contained within the `.iso` file will now be accessible.
 4. In Windows Explorer, navigate to the **Tools** folder and locate the 2 files that are used to uninstall the existing database and engine.

IMPORTANT: Be certain to uninstall the database first and the database engine second.

```
uninstall_database.cmd
```

```
uninstall_engine.cmd
```

5. Double-click each of the uninstall files to remove the existing database.

6. Once the existing database has been exported and the uninstall process completed, restart the machine and log in as Administrator to complete the uninstallation process.
 - a. Be certain to use the **Restart** option; do not just logoff.
 - b. The user **must** be logged in as Administrator to complete the uninstallation process.
 - c. This process deletes the remaining files.

2.1.1 Uninstalling the Database in Linux

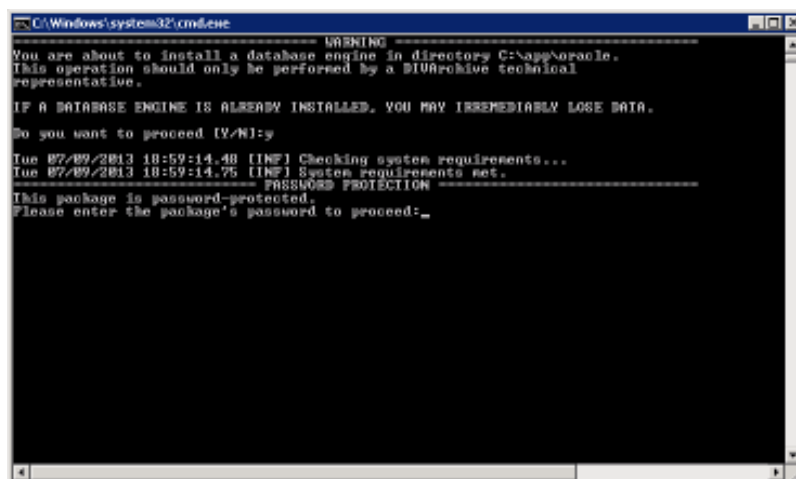
Use the following procedure to uninstall the existing database in a Linux environment:

1. Log in as the Oracle operating system user.
2. Open a terminal window.
3. Execute `$ORACLE_HOME/deinstall/deinstall`

2.2 Installing the DIVArchive Oracle Database in Windows

1. Navigate to the `.iso` file from DIVArchive Oracle Database to be installed (*refer to steps 3 through 6 in Section 0 for instructions*)
2. If the installation is to be located on C: drive, the following 2 folders will need to be created on C: drive. If the installation is to be located on E: and F: drives, there is no need to create these 2 folders.
 - `u02`
 - `u03`
3. Installing on E: and F: drives are the recommend, and most commonly used, locations for database installation.
4. Once these folders are created, open Windows Explorer and navigate to the folder containing the extracted `.iso` file. Locate the `InstallEngine.cmd` file in the main folder and double-click it to execute the Database Engine Installation.
5. A password is required in order to complete the Database Engine Installation. **Please contact Oracle Support to obtain the required password.**

Figure 1: Database Engine Installation – Password Required



6. Once the password is entered, the installation will begin. This process takes approximately 5 minutes, depending upon the machine it is being installed on – please be patient.
7. Once the Database Engine Installation is complete the screen will look similar to the figure below. After a key is pressed the Command Window will close.

Figure 2: Database Engine Installation Complete

```

C:\Windows\system32\cmd.exe
***** WARNING *****
You are about to install a database engine in directory C:\AppData\Local.
This operation should only be performed by a DIVArchive technical
representative.

IF A DATABASE ENGINE IS ALREADY INSTALLED, YOU MAY IRREDEMIABLY LOSE DATA.
Do you want to proceed [Y/N]:y

Tue 07/09/2013 18:59:14.40 [INF] Checking system requirements...
Tue 07/09/2013 18:59:14.75 [INF] System requirements met.
***** PASSWORD PROTECTION *****
This package is password-protected.
Please enter the package's password to proceed:c0r4ZyBd1aR0nd

Tue 07/09/2013 19:03:50.12 [INF] *****
Tue 07/09/2013 19:03:50.14 [INF] - BEGINNING DATABASE ENGINE INSTALLATION -
Tue 07/09/2013 19:03:50.15 [INF]
Tue 07/09/2013 19:03:50.35 [INF] Extracting database engine...
Tue 07/09/2013 19:09:12.63 [INF] Extracting 32-bit client...
Tue 07/09/2013 19:09:19.00 [INF] Extracting 32-bit database package...
Tue 07/09/2013 19:09:19.10 [INF] Creating registry pointer file...
Tue 07/09/2013 19:09:19.30 [INF] Configuring client dlls U9...
Tue 07/09/2013 19:09:19.74 [INF] Configuring listener...
Tue 07/09/2013 19:09:19.61 [INF] Fixing system path...
Tue 07/09/2013 19:09:19.80 [INF] Configuring environment variables...
Tue 07/09/2013 19:09:40.00 [INF] Configuring registry...
Tue 07/09/2013 19:09:40.64 [INF] Creating SBA group...
Tue 07/09/2013 19:09:40.90 [INF] Creating listener service...
Tue 07/09/2013 19:09:41.00 [INF] *****
Tue 07/09/2013 19:09:41.02 [INF] - END OF DATABASE ENGINE INSTALLATION -
Tue 07/09/2013 19:09:41.03 [INF]
Tue 07/09/2013 19:09:41.05 [INF] You may now proceed with the database installation script.
Tue 07/09/2013 19:09:41.06 [INF] The log of this installation has been saved as: C:\Users\ADMINI~1\AppData\Local\
Temp\InstallEngine.log
Press any key to continue . . .
  
```

8. Navigate back to the folder containing the extracted .iso file. In the main folder there are several files named:
 - a. InstallDatabase-small.cmd
 - b. InstallDatabase-large.cmd
 - c. InstallDatabase-huge.cmd

Note: Small, Large, and Huge determines the size of the Database install. The InstallDatabase-huge.cmd is recommended and is most commonly used to create the database for DIVArchive. Double-click the desired file to execute the Database Installation.

9. After the Database Installation begins, the user will be asked whether or not to use the mount points that were created (c:\u02 and c:\u03).

Figure 3: Install Database Command Window – Mount Points

```

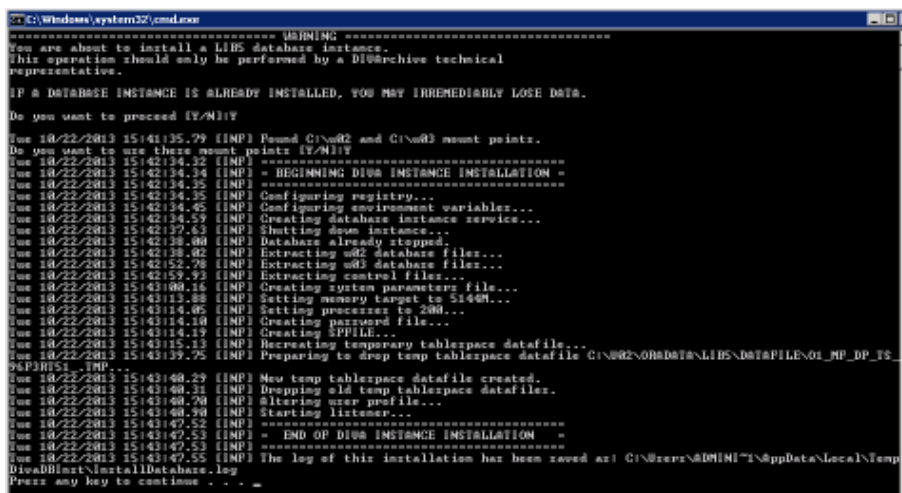
C:\Windows\system32\cmd.exe
***** WARNING *****
You are about to install a LIVE database instance.
This operation should only be performed by a DIVArchive technical
representative.

IF A DATABASE INSTANCE IS ALREADY INSTALLED, YOU MAY IRREDEMIABLY LOSE DATA.
Do you want to proceed [Y/N]:y

Tue 07/09/2013 19:21:11.24 [INF] Found C:\u02 and C:\u03 mount points.
Do you want to use these mount points [Y/N]:y
  
```


10. If the answer given is **Y** (Yes) the installation will continue; however if the Answer given is **N** (No), the script will check for the E and F mount points. If the E and F mount points do not exist the installation will halt and exit.

Figure 4: Install Database Command Window – Use Mount Points (Yes)

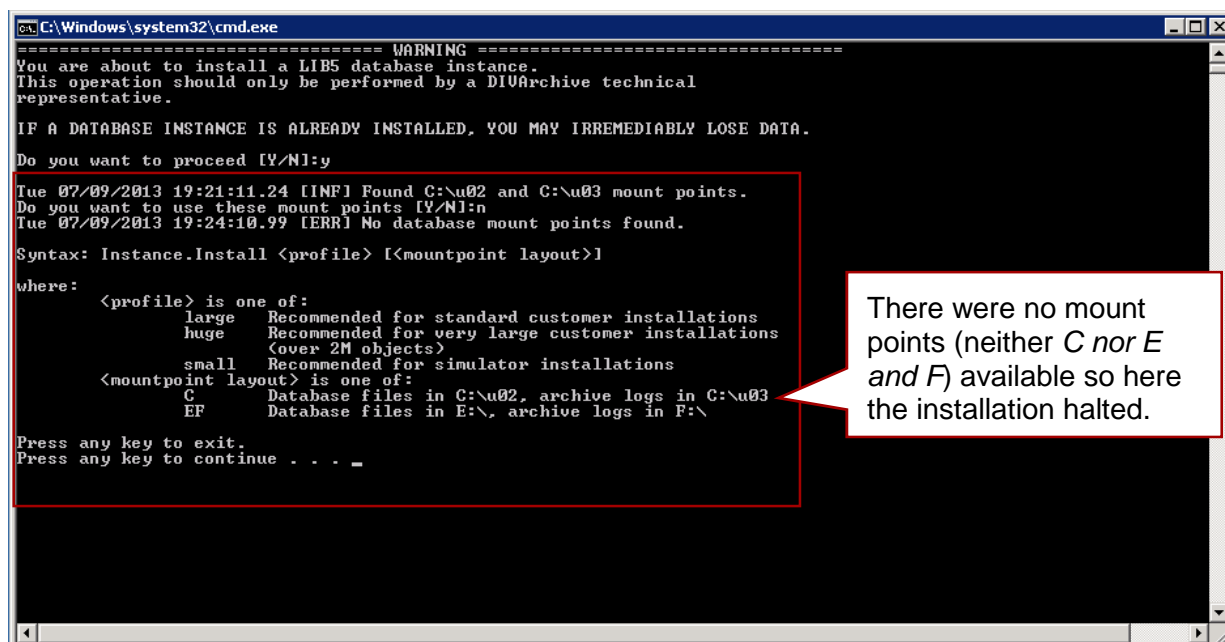


```
C:\Windows\system32\cmd.exe
===== WARNING =====
You are about to install a LIB5 database instance.
This operation should only be performed by a DIVArchive technical
representative.

IF A DATABASE INSTANCE IS ALREADY INSTALLED, YOU MAY IRREMEADIABLY LOSE DATA.
Do you want to proceed [Y/N]:Y

Tue 10/22/2013 15:41:35.79 [INF] Found C:\u02 and C:\u03 mount points.
Do you want to use these mount points [Y/N]:Y
Tue 10/22/2013 15:42:34.34 [INF] - BEGINNING DIV8 INSTANCE INSTALLATION -
Tue 10/22/2013 15:42:34.35 [INF] =====
Tue 10/22/2013 15:42:34.35 [INF] Configuring registry...
Tue 10/22/2013 15:42:34.45 [INF] Configuring environment variables...
Tue 10/22/2013 15:42:34.59 [INF] Creating database instance service...
Tue 10/22/2013 15:42:37.63 [INF] Shutting down instance...
Tue 10/22/2013 15:42:38.00 [INF] Database already stopped.
Tue 10/22/2013 15:42:38.02 [INF] Extracting u02 database files...
Tue 10/22/2013 15:42:52.70 [INF] Extracting u03 database files...
Tue 10/22/2013 15:42:59.73 [INF] Extracting control files...
Tue 10/22/2013 15:43:00.15 [INF] Creating system parameters file...
Tue 10/22/2013 15:43:13.88 [INF] Setting memory target to 5140M...
Tue 10/22/2013 15:43:14.05 [INF] Setting processor to 200...
Tue 10/22/2013 15:43:14.10 [INF] Creating password file...
Tue 10/22/2013 15:43:14.19 [INF] Creating SPFILE...
Tue 10/22/2013 15:43:15.13 [INF] Recreating temporary tablespace datafile...
Tue 10/22/2013 15:43:19.75 [INF] Preparing to drop temp tablespace datafile C:\u02\ORADATA\LIB5\DATAFILE\01_MF_DP_TS...
10/22/2013 15:43:19.75 [INF]
Tue 10/22/2013 15:43:40.29 [INF] New temp tablespace datafile created.
Tue 10/22/2013 15:43:40.31 [INF] Dropping old temp tablespace datafile.
Tue 10/22/2013 15:43:40.70 [INF] Altering user profile...
Tue 10/22/2013 15:43:40.70 [INF] Starting listener...
Tue 10/22/2013 15:43:47.52 [INF] =====
Tue 10/22/2013 15:43:47.52 [INF] - END OF DIV8 INSTANCE INSTALLATION -
Tue 10/22/2013 15:43:47.52 [INF] =====
Tue 10/22/2013 15:43:47.55 [INF] The log of this installation has been saved as: C:\Users\ADMINI~1\AppData\Local\Temp\
DivArchive\InstallDatabase.log
Press any key to continue . . .
```

Figure 5: Install Database Command Window – No Mount Points Available



```
C:\Windows\system32\cmd.exe
===== WARNING =====
You are about to install a LIB5 database instance.
This operation should only be performed by a DIVArchive technical
representative.

IF A DATABASE INSTANCE IS ALREADY INSTALLED, YOU MAY IRREMEADIABLY LOSE DATA.
Do you want to proceed [Y/N]:y

Tue 07/09/2013 19:21:11.24 [INF] Found C:\u02 and C:\u03 mount points.
Do you want to use these mount points [Y/N]:n
Tue 07/09/2013 19:24:10.99 [ERR] No database mount points found.

Syntax: Instance.Install <profile> [<mountpoint layout>]
where:
    <profile> is one of:
        large    Recommended for standard customer installations
        huge     Recommended for very large customer installations
                 <over 2M objects>
        small    Recommended for simulator installations
    <mountpoint layout> is one of:
        C        Database files in C:\u02, archive logs in C:\u03
        EF       Database files in E:\, archive logs in F:\

Press any key to exit.
Press any key to continue . . .
```

11. When the installation has completed, the DIVArchive Database is ready to have the previously exported data (c:\backup.dmp) imported.

12. Create the DIVArchive Database user using the scripts provided in the DIVArchive Installation.

```
cd /d c:\DIVA_HOME\program\database\install
```

```
create_diva_user {db_sys_passwd} {diva_dbuser}  
{diva_dbuser_password} -useronly
```

13. Open a Windows Command Prompt and import the database dump file using the following command:

```
imp system/manager file=c:\dumpfile.dmp  
fromuser=<username> touser=<username>
```

- **fromuser** = the username from where the dump was exported.
- **touser** = the username to which the dump is imported.

Example:

```
imp system/manager file=c:\dumpfile.dmp  
fromuser=divaold touser=divanew
```

Assuming no errors occurred, at this point the database has been installed and the existing data from the original database has been imported.

2.3 Installing the DIVArchive Oracle Database in Linux

Before running the installer verify the following is complete:

- Yum is configured to connect to the latest release of Oracle Linux.
- Recommended partitions for the Oracle Database. Oracle recommend partitions so that the space is dedicated to Oracle DB.
 - /u01 partition for the Oracle Binaries
 - /u02 partition for the Oracle Database files (8 KB cluster size recommended)
 - /u03 partition for the Oracle Archive Logs (4 KB cluster size recommended)
 - /u04 partition for the Oracle database backups (64 KB cluster size recommended)

Refer to the *Oracle DIVArchive Installation and Configuration Guide* in the *Oracle DIVArchive 7.4 Core Documentation* library for partitioning information.

To begin installation run the following command as *root*:

```
./OracleDivaDB_3-0-0_12_1_0_2_0_SE2_OEL7_x86_64.sh
```

You will be prompted to create a password for the operating system *oracle* user and the *OracleDB* system user. This information must be stored in a safe place.

The following is the log output of the Linux install

```
[root@DIVA-AX52-43 OracleDatabase]# ./OracleDivaDB_3-0-0_12_1_0_2_0_SE2_OEL7_x86_64.sh
```

Checking Current user has root permissions

Checking Oracle user exists

Installing Oracle pre-requisite package. Please wait - For progress see /root/OSDC/OracleDatabase/log/oracleinstall.log...

Checking Oracle pre-requisite package.

Installing unzip package. Please wait - For progress see /root/OSDC/OracleDatabase/log/oracleinstall.log...

Checking unzip package.

Checking OS group oinstall.

Checking OS group dba.

Checking OS user oracle exists.

Checking oracle user part of oinstall group.

Checking oracle user part of dba group.

New OS user ORACLE was created.

Please enter the password you would like to set for OS user ORACLE.

Password recommendations:

-at least 6 characters long

-has at least one digit, one Upper and Lower case Alphabet

OS oracle Password:

Renter OS oracle Password:

Checking disk mount points..../u01,/u02,/u03,/u04

Prerequisite install complete sucessfully.

Extract OracleDB from OracleDivaDB_3-0-0_12_1_0_2_0_SE2_OEL7_x86_64 - starting installation... please wait

New OracleDB user SYS is created.

Please enter the password you would like to set for OracleDB user SYS.

Password recommendations:

-at least 6 characters long

-has at least one digit, one Upper and Lower case Alphabet

DB sys Password:

Renter DB sys Password:

Running ~oracle/OracleDivaDB_3-0-0_12_1_0_2_0_SE2_OEL7_x86_64/Install.sh as
oracle user

Oracle Software Install Starting..

Checking disk mount points.../u01,/u02,/u03,/u04

Preinstall checkup.

Extract database zip files

extracting p21419221_121020_Linux-x86-64_3of10.zip...

extracting p21419221_121020_Linux-x86-64_4of10.zip...

Total memory (GB) : 128640

Current Available memory (GB): 126892

Starting Oracle software Universal installer.

Starting Oracle Universal Installer...

Checking Temp space: must be greater than 500 MB. Actual 91618 MB Passed

Checking swap space: must be greater than 150 MB. Actual 32767 MB Passed

Preparing to launch Oracle Universal Installer from /tmp/OraInstall2015-12-09_05-20-33PM. Please wait ...You can find the log of this install session at:

/u01/app/oraInventory/logs/installActions2015-12-09_05-20-33PM.log

Prepare in progress.

..... 8% Done.

Prepare successful.

Copy files in progress.

..... 15% Done.
..... 20% Done.
..... 25% Done.
..... 30% Done.
..... 37% Done.
..... 43% Done.
..... 49% Done.
..... 54% Done.
..... 59% Done.
..... 64% Done.
..... 69% Done.
.....

Copy files successful.

Link binaries in progress.

.....

Link binaries successful.

Setup files in progress.

..... 74% Done.

Setup files successful.

Setup Inventory in progress.

Setup Inventory successful.

..... 80% Done.

Finish Setup successful.

The installation of Oracle Database 12c was successful.

Please check '/u01/app/oraInventory/logs/silentInstall2015-12-09_05-20-33PM.log' for more details.

Setup Oracle Base in progress.

Setup Oracle Base successful.

..... 90% Done.

Prepare for configuration steps in progress.

Prepare for configuration steps successful.

..... 95% Done.

As a root user, execute the following script(s):

1. /u01/app/oraInventory/orainstRoot.sh
2. /u01/app/oracle/product/12.1.0/dbhome_1/root.sh

..... 100% Done.

Successfully Setup Software.

As the install user, execute the following script to complete the configuration:

```
/u01/app/oracle/product/12.1.0/dbhome_1/cfgtoollogs/configToolAllCommands  
RESPONSE_FILE=<response_file>
```

Notes:

This script must be run on the same host from where installer was run.

This script needs a small password properties file for configuration assistants that require passwords (refer to install guide document)

Oracle Software Install completed sucessfully ..

Running /u01/app/oraInventory/orainstRoot.sh

Running /u01/app/oracle/product/12.1.0/dbhome_1/root.sh

Running ~oracle/OracleDivaDB_3-0-0_12_1_0_2_0_SE2_OEL7_x86_64/CreateDB.sh as oracle user

Oracle Database Instance creation started

Creating Oracle Database Instance. This can take a long time.

Please Wait - Log /home/oracle/OracleDivaDB_3-0-0_12_1_0_2_0_SE2_OEL7_x86_64/log/install.log

Check PMON process is running.

Check LISTNER is running.

Setting up Environment.

Customizing the database. Please Wait - Log /home/oracle/OracleDivaDB_3-0-0_12_1_0_2_0_SE2_OEL7_x86_64/log/install.log

```
Creating ARCH_LOGS_SPACE_RESERVE on /u03.
```

```
Cleaning Up.
```

```
*****
```

```
Oracle Database Instance created sucessfully
```

```
*****
```

```
Setting up OracleDB to start on boot
```

```
Updating /etc/oratab.
```

```
Creating /etc/init.d/dbora
```

```
[root@DIVA-AX52-43 OracleDatabase]#
```

2.4 Oracle Statistics Installation and Configuration

Statistics collection in a Linux environment is achieved through the Database Job Scheduler. The required job is created when the database user and schema are created using the database scripts. The Oracle Statistics are not installed by default in Windows. To install the Oracle Statistics in a Windows environment use the following procedures:

1. Unzip the package `DIVABackup&Stat_<version>.zip` into a folder.

```
7z x DIVABackup&Stat_<version>.zip -o<destination_folder> -y
```
2. Navigate to the `DIVABackup_and_stats_4.6` folder and copy all the folders and files directly under it to `c:\app\oracle\admin`.
3. Navigate to the `c:\app\oracle\admin\stat\schedule` folder and you will find two folders:
 - Win-2003
 - Win-2008
4. Navigate to corresponding folder based on the current Operating System Version of the system where this package is being installed.
5. Execute `Install_Statistics_Task.bat` and you will be prompted for the administrator login credentials.
6. By default the credentials are `administrator` and `diva` respectively. Take care to put the correct information otherwise the Scheduled Tasks will not be installed.
7. The package installs all necessary Windows Scheduled Tasks for the Oracle Statistics functions.
 - The package for the Oracle Statistics is installed in the `c:\app\oracle\admin\stat` folder.

2.5 Using the *create_diva_user* Script

The `create_divas_user` script has been enhanced to provide greater functionality. This section describes the use of the script for creating user accounts and assigning, or updating, the user passwords. The following is the general script syntax:

Windows:

```
create_diva_user.bat {db_sys_passwd} {diva_dbuser} {diva_dbuser_password}  
oracle_connection [-useronly|-tablesonly] [-customer_tablespaces  
tables_tablespace indexes_tablespace temp_tablespace]
```

Linux:

```
./create_diva_user.bat {db_sys_passwd} {diva_dbuser} {diva_dbuser_password}  
oracle_connection [-useronly|-tablesonly] [-customer_tablespaces  
tables_tablespace indexes_tablespace temp_tablespace]
```

To assign a new password, or change an existing password, use the following command:

Windows:

```
create_diva_user.bat DIVA|SYS {current_password} {new_password} -orapwd
```

Linux:

```
./create_diva_user.bat DIVA|SYS {current_password} {new_password} -orapwd
```

Parameters:

- `db_sys_passwd` - the Oracle `sys` account password
- `diva_dbuser` - the user name to be created
- `diva_dbuser_password` - the associated user password
- `oracle_connection` - The Oracle TNS Service Name or Oracle connection string (*for example, IP_ADDRESS:PORT/ORACLE_SERVICE_NAME*).
- `DIVA|SYS` - Use either DIVA or SYS to reset the password for that account in the password file.
- `new_password` - the new password
- `current_password` - the current password. If there is no current database password then enter a new password for this parameter.

Options:

- `-useronly` – only creates the database user and no database objects
- `-tablesonly` – only creates the database objects for the given user
- `-custom_tablespaces` – create the user using customer tablespaces
- `tables_tablespace` – the tablespace for the tables
- `indexes_tablespace` – the tablespaces for indexes
- `temp_tablespace` – the database temporary tablespace

3 DIVArchive Database Migration

The procedures below describe how to migrate older DIVArchive versions with Oracle 9i installed, to a newer DIVArchive version with Oracle 11g installed. Typically this procedure is performed to upgrade customers with legacy DIVArchive installations to a current release.

3.1 Oracle 9 to Oracle 11 Migration Procedure

3.1.1 Target Environment

- DIVArchive 5.5 to 6.1 with Oracle 9i for the Source Machine.
- DIVArchive 6.2 and later with Oracle 11g for the Target Machine.
- Supported systems for the Target Machine are:
 - Windows 2003 32-bit
 - Windows 2008 32-bit
 - Windows 2008 R2 64-bit

3.1.2 Prerequisites

For Windows 2003/2008/R2 32-bit/64-bit, the DIVArchive Oracle Database .iso file for Oracle 11g must be extracted on the Target Machine and the DIVArchive distribution must be installed on the Target Machine.

3.1.3 Important Notes

- **The procedure does NOT cover the DIVArchive upgrade.** Specifically, the scripts must be run afterward to upgrade the database tables and triggers to the target DIVArchive version. The scripts are provided in the Database Upgrade Distribution Package.
- Some rare customized environments may use triggers created under the system Oracle user (*generally for SPM object assignments*). This procedure doesn't cover this case and it is necessary to re-create these triggers manually. This is generally achieved by re-using the customized scripts developed for this purpose at the time of the previous installation (*the site's Delivery Plan should provide this information*).

3.1.4 Steps to be conducted on the source machine (Oracle 9 DIVArchive Manager)

3.1.4.1 Exporting DIVArchive Database Dump File from the Source Computer

Stop all running DIVArchive services, then open a command line window on the source machine and run the following command:

```
exp userid=diva/lib5 file=SomePath\diva_ora_9.dmp  
buffer=1048576 feedback=10000 statistics=none
```

Copy the dump files (*diva_ora_9.dmp*) from the Source Machine to the Target Machine.

3.1.4.2 Exporting Oracle DIVArchive Storage Plan Manager Data from the Source Computer (SPM 5.5 and 5.6 only)

This step is applicable **only** to DIVArchive versions 5.5 and 5.6 when SPM is in use. In DIVArchive versions 5.7 and later, SPM data resides in the `diva` user schema and doesn't need to be exported separately.

1. Open a command line window on the source machine and run the following command:

```
exp userid=divanet/lib5 file=SomePath\divanet_ora_9.dmp  
buffer=1048576 feedback=10000 statistics=none
```

2. Copy the dump files `divanet_ora_9.dmp` from the Source Machine to the Target Machine.

3.1.5 Steps to be conducted on the Target Computer (Oracle 11 DIVArchive Manager)

3.1.5.1 Uninstalling Oracle on the Target Computer

These steps are necessary when the Target Machine is not a brand new Manager – typically it will be a Backup Manager. Also refer to Section 0 for uninstall instructions.

Note: Please use the same DIVArchive Oracle Package used for installation to perform Oracle uninstallation.

1. Extract the DIVArchive Database .iso file (*refer to Section 0*).
2. Go to the `tools/uninstall` folder in the DIVArchive Database extracted .iso folder and execute the instance and product uninstall scripts in the following sequence:

```
uninstall_database.cmd
```

```
uninstall_engine.cmd
```

IMPORTANT: at the end of the `uninstall_engine.cmd` execution, the script may ask to reboot the machine if any locked files were encountered. If asked to reboot, make sure to perform the reboot before proceeding with the remaining steps.

3.1.5.2 Installing Oracle 11g on the Target Computer

Refer to Installing the DIVArchive Oracle Database and follow the procedures there to install Oracle 11g on the Target Machine.

Note: the Database Instance Size must be equal to or larger than the Instance Size of the Source Machine.

For example; if the Source Machine's Database Instance Size is large then the Target Machine's Database Instance Size must be *at least* large or huge, otherwise the import process may fail.

3.1.6 Uninstalling the Database in Linux

Use the following procedure to uninstall the existing database in a Linux environment:

3. Log in as the Oracle operating system user.
4. Open a terminal window.
5. Execute `$ORACLE_HOME/deinstall/deinstall`

Installing the DIVArchive Oracle Database and follow the procedures there to install Oracle 11g on the Target Machine.

Note: the Database Instance Size must be equal to or larger than the Instance Size of the Source Machine.

For example; if the Source Machine's Database Instance Size is large then the Target Machine's Database Instance Size must be *at least* large or huge, otherwise the import process may fail.

3.1.7 Importing DIVArchive Database Dump File to the Target Computer

Open a command line window on the Target Machine and execute the following commands:

```
cd /d c:\DIVA_HOME\program\database\install
```

```
create_diva_user {db_sys_passwd} {diva_dbuser}  
{diva_dbuser_password}-useronly
```

```
imp userid=diva/lib5 file=[SomePath]\diva_ora_9.dmp  
ignore=y full=y buffer=1048576 commit=Y feedback=10000
```

If the DIVArchive System being migrated is version 6.5 or later, there maybe a few Oracle Warnings regarding creating views as shown below:

```
IMP-00041: Warning: object created with compilation warnings  
"CREATE FORCE VIEW ...
```

The warnings can be ignored as long as they are about creating a VIEW.

3.1.7.1 Importing DIVArchive Storage Plan Manager Data (SPM 5.5 and 5.6 only)

This step is applicable only to DIVArchive versions 5.5 and 5.6 when SPM is in use. In DIVArchive versions 5.7 and later, SPM Data resides in the `diva` user schema and doesn't need to be imported separately.

1. Open a command line window on the target machine and run the following commands:

```
cd /d c:\diva\program\spm\database
```

2. Make a backup copy of the `create_divanet_user.bat` and `create_divanet_user-no_triggers.bat` files.
3. Edit `create_divanet_user-no_triggers.bat` with a text editor and replace the following line:

```
set must_create_trigger=1
```

with

```
set must_create_trigger=0
```

and proceed with the remaining commands below:

```
create_divanet_user-no_triggers lib5 diva divanet lib5 -useronly  
imp userid=divanet/lib5 file=SomePath\divanet_ora_9.dmp ignore=y  
full=y buffer=1048576 commit=Y feedback=10000
```

The procedure is now complete and the database upgrade scripts may now be executed.

3.2 Oracle 11.1 to Oracle 11.2 Migration Procedure

3.2.1 Target Environment

- DIVArchive 5.7 and later with Oracle 11.1 for the Source Machine.
- DIVArchive 5.7 and later with Oracle 11.2 for the Target Machine.
- Supported systems for the Target Machine are:
 - Windows 2003 32-bit
 - Windows 2008 32-bit
 - Windows 2008 R2 64-bit

3.2.2 Prerequisites

- For Windows 2003/2008 32-bit/64-bit, the DIVArchive Database 2.0.6 (*or later*) CD for Oracle 11g must be mounted on the Target Machine.
- For Windows 2008 R2 64-bit, the DIVArchive Database 2.2.3 (*or later*) CD for Oracle 11g must be mounted on the Target Machine.

- The DIVArchive Distribution must be installed on the Target Machine
- The DIVUpgrade Distribution must be installed on the Target Machine.

3.2.3 Important Notes

- **The procedure does NOT cover the DIVArchive upgrade.** Specifically, the scripts must be run afterward to upgrade the database tables and triggers to the target DIVArchive version. The scripts are provided in the Database Upgrade Distribution Package.
- Some rare customized environments may use triggers created under the system Oracle user (*generally for SPM object assignments*). This procedure doesn't cover this case and it is necessary to re-create these triggers manually. This is generally achieved by re-using the customized scripts developed for this purpose at the time of the previous installation (*the site's Delivery Plan should provide this information*).

3.2.4 Steps to be conducted on the Source Computer (Oracle 11.1 DIVArchive Manager)

3.2.4.1 Exporting DIVArchive Manager and File System Data from the Source Computer

Stop all running DIVArchive services, then open a command line window on the Source Machine as user `diva` and run the following command:

```
exp userid=diva/lib5 file=SomePath\diva_ora_11-1.dmp
buffer=1048576 feedback=10000 statistics=none
```

Now copy the dump files (`diva_ora_11-1.dmp`) from the Source Machine to the Target Machine.

3.2.4.2 Steps to be conducted on the Target Computer (Oracle 11.2 DIVArchive Manager)

1. Uninstall Oracle on the target machine.

- This is necessary when the target machine is not a brand new Manager. Typically it will be a Backup Manager.
 - Extract the DIVArchive Database installation `.iso` file (*refer to Section 0*).
 - Navigate to the `tools/uninstall` folder in the DIVArchive Database extracted `.iso` folder and execute the instance and product uninstall scripts in the following sequence:

```
uninstall_database.cmd
```

```
uninstall_engine.cmd
```

IMPORTANT: at the end of the `uninstall_engine.cmd` execution, the script may ask to reboot if some locked files were encountered. If asked **to do** so, make sure the reboot is performed before proceeding with the remaining steps.

3.2.5 Installing Oracle 11.2 on the Target Computer

Refer to

3.2.6 Uninstalling the Database in Linux

Use the following procedure to uninstall the existing database in a Linux environment:

4. Log in as the Oracle operating system user.
5. Open a terminal window.
6. Execute `$ORACLE_HOME/deinstall/deinstall`

Installing the DIVArchive Oracle Database and follow the instructions there to install Oracle 11g on the Target Machine.

Note: the Database Instance Size must be equal to or larger than the Instance Size of the Source Machine.

For example; if the Source Machine's Database Instance Size is **Large**, then the Target Machine's Database Instance Size must be at least **Large** or **Huge**, otherwise the import process may fail.

3.2.6.1 Importing DIVArchive Database Dump File to the target machine

1. Open a command line window on the target machine and run the following commands:

```
cd /d c:\diva\program\database\install
```

```
create_diva_user {db_sys_passwd} {diva_dbuser}  
{diva_dbuser_password} -useronly
```

```
imp userid=diva/lib5 file=SomePath\diva_ora_11-1.dmp  
ignore=y full=y buffer=1048576 commit=Y feedback=10000
```

The procedure is now complete. Proceed with database upgrade scripts.

4 DIVArchive Backup Service Installation and Configuration

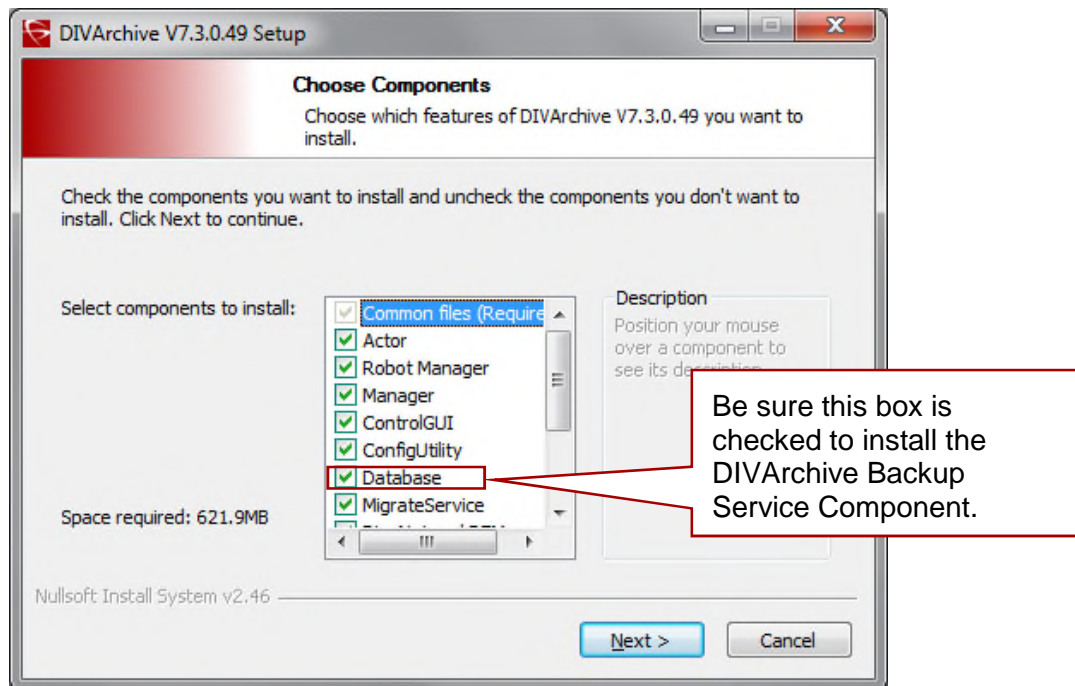
The DIVArchive Backup Service component is installed as an integral part of the standard DIVArchive System installation. **The component must be installed on the same server as the DIVArchive Manager and Oracle Database.** The DIVArchive Backup Service allows for configuration of scheduled backups through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

The service utilizes existing DIVArchive Backup Scripts (*these scripts use the Oracle RMAN tool*) to generate full database backups and incremental database backups of the Oracle Database. Generated Oracle Backup Files and Metadata Database Files that are created by the Manager when Complex Objects are created will be incrementally replicated by the Backup Service to remote backup servers using the RSYNC tool.

The DIVArchive Backup Service should be configured to replicate files across multiple backup servers. Before installation, the operator **must** identify the following systems for successful usage of the DIVArchive Backup Service:

- Which machine will be called **Backup System 1**.
 - **Required**
- Which machine will be called **Backup System 2**.
 - **Required**
- Which machine(s) will be called **Backup System n**.
 - **Backup System n** is **optional** and only required if more than 2 Backup Systems are desired.

Figure 6: DIVArchive Installation Screen



4.1 DIVArchive Backup Service Prerequisites

The following components and services are prerequisites for use of the DIVArchive Backup component. CYGWIN with the RSYNC service is required for the Backup Service to function. The DIVArchive Manager Server, DIVArchive Backup Manager Server, DIVArchive Database Server, and all Remote Backup Systems must have the following installed:

The first two modules must be installed in the specific order noted before proceeding.

- CYGWIN
 - CYGWIN must be installed using the DIVArchive Prerequisite Package.
- RSYNC
 - CYGWIN **must** be installed first before RSYNC installation.
 - <http://rsync.samba.org>
 - RSYNC Modules must be configured.
 - RSYNC Service must be running.
 - Refer to Section 0 for more details.
- The DIVArchive Backup Service must be installed on the server where the Manager and Oracle Database are installed.
- 7zip for 32-bit Windows
- Java JDK/JRE (build 1.8.0_45-b02)

4.2 DIVArchive Backup Service Configuration

When the DIVArchive Backup Service is selected to be installed, it will be installed to the `DIVA_HOME\Program\DBBackup` folder by default. The default Backup Service configuration file is named `backup.conf.ini` and is located in the `DIVA_HOME\Program\conf\db_backup` folder.

There are settings that need to be made in both the DIVArchive Configuration Utility and the Backup Service Configuration File. The configuration file must be renamed from `backup.conf.ini` to `backup.conf`.

The configuration file must be edited, setting the application parameters and verifying the default values.

Note: A forward slash (/) must be used instead of the typical backslash (\) for the folder separator.

There are two parameters defining the scope of operations in the DIVArchive Backup Service's `backup.conf` configuration file (as listed in the table below).

Table 2: DIVArchive Backup Service Parameters

Parameter	Value
<code>BACKUP_SERVICE_MANAGE_DATABASE_BACKUPS</code>	Enables or disables backup of the DIVArchive Database. The default value is Y (Yes/enabled).

Parameter	Value
BACKUP_SERVICE_MANAGE_METADATA_BACKUPS	Enables or disables backup of the Metadata Database. The default value is Y (<i>Yes/enabled</i>).

If both of the above parameters are set to **N** (*No/disabled*), the DIVArchive Backup Service will not start.

In the Configuration Utility, the **Complex Objects Metadata Database Location**, **Database Backup Notification**, and **Enable Metadata Database Feature** parameters must be set in the DIVArchive Configuration Utility's **Manager Panel**. The location of the Metadata Database Files **must** be set to an *existing, valid* location because the Manager uses this value to save the Metadata Database Files. An example Metadata Database location would be **F:\META_DATABASE_ROOT**.

Table 3: Configuration Utility Parameters

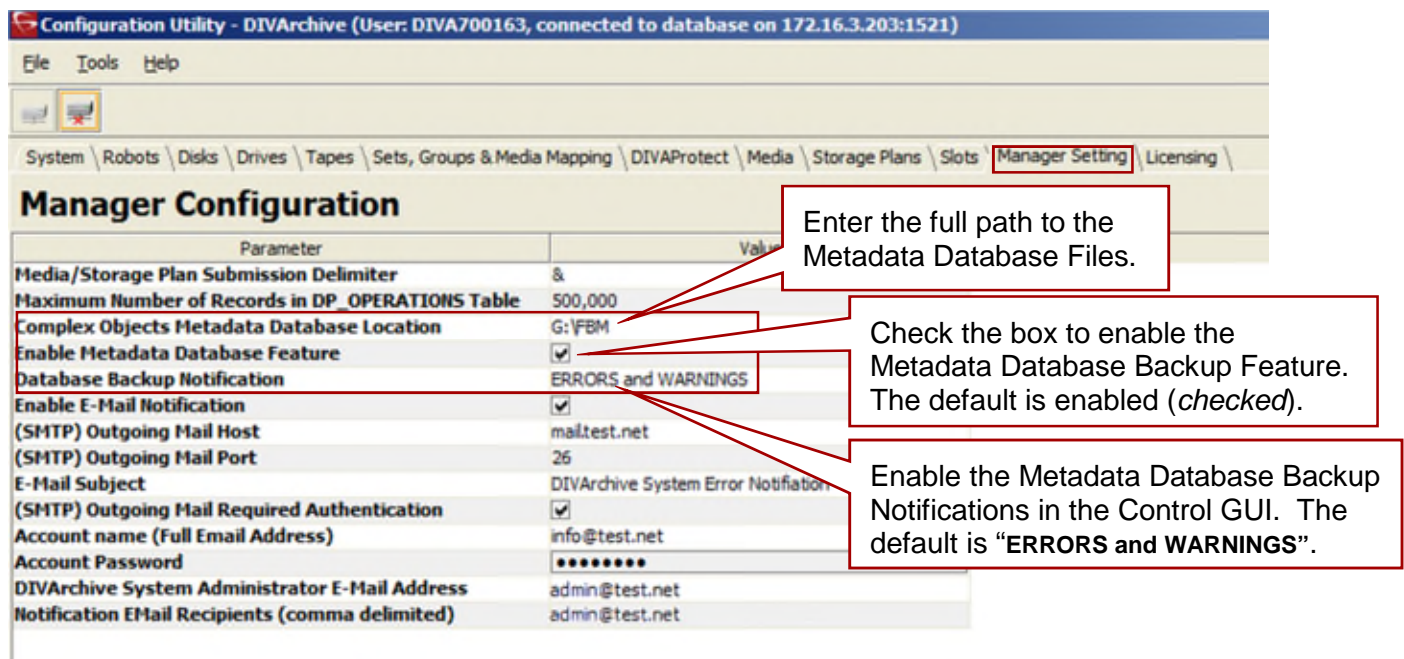
Parameter	Default Value or Required Settings
Complex Objects Metadata Database Location	<p>This is the path to the Metadata Database. There is no default path specified. The path will be validated by Manager and the Backup Service</p> <p>Note: This parameter is not reloadable and is only checked once when the Manager Service and the Backup Service start. The Manager and Backup services must be restarted if any changes are made to this parameter.</p>
Database Backup Notification	<p>ERRORS and WARNINGS - Popup notifications are displayed in all connected Control GUIs when there is a Backup Error or Warning. Errors and Warnings are also recorded in the events log.</p> <p>ERRORS - Popup notifications are displayed in all connected Control GUIs <u>only</u> for Backup Errors. Errors <u>and</u> Warnings are recorded in the events log.</p> <p>DISABLED - Popup notification are disabled but all of the Errors and Warnings are recorded in the events log.</p> <p>The default is ERRORS and WARNINGS.</p> <p>Note: Connected Control GUIs must be restarted if any changes are made to this parameter.</p>

Parameter	Default Value or Required Settings
Enable Metadata Database Feature	<p>Only when this parameters is enabled (<i>the box is checked</i>) the DIVArchive Manager can archive Complex Objects and Backup Service can backup up Metadata Database. When disabled (<i>the box is unchecked</i>) DIVArchive Manager cannot archive Complex Objects and the DIVArchive Backup Service cannot backup the Metadata Database. The default is enabled.</p> <p>Note: This parameter is not reloadable and is only checked once when the Manager Service and the Backup Service start. The Manager and Backup services must be restarted if any changes are made to this parameter.</p>

These values should be set before starting the Manager and Backup Services:

1. Launch the Configuration Utility.
2. Connect to the appropriate database.
3. Select the **Manager Setting Tab**.
4. Set the required value for the **Complex Objects Metadata Location** parameter.
 - a. The folder must be pre-existing.
 - b. A drive with ample storage should be used. Refer to Section 5.2 for information about space calculations.
 - c. Enable the **Database Backup Notification** to receive notifications in the Control GUI. The default is **ERRORS and WARNINGS**.
 - d. **Enable the Enable Metadata Database Feature** to enable Manager to archive complex Objects. The default is **enabled**.

Figure 7: Configuration Utility - Manager Tab – Metadata Database Parameters



If the `BACKUP_SERVICE_MANAGE_METADATA_BACKUPS` is set to **Y** (*yes/enabled*) in the Backup Service Configuration File, the values of **Enable Metadata Database Feature** and **Complex Objects Metadata Database Location** in the Configuration Utility is validated on Backup Service start-up. If the Metadata Database feature is disabled or the Metadata Database Location is invalid, the Backup Service will fail to start.

DIVArchive Backup Services Email Notifications will notify all users on the email list of errors. The parameters must be set up in the DIVArchive Configuration Utility before starting the Manager or Backup Services. To enable this functionality:

1. Launch the Configuration utility.
2. Connect to the appropriate Database.
3. Select the **Manager Setting Tab**.
4. Set the required values for the **Email Notifications** parameters.
 - a. **Enable E-Mail Notification:** If selected Manager will attempt to send out email using the configured values.
 - b. **(SMTP) Outgoing Mail Host:** Provide the URL or IP address of the email provider for outgoing mail. This should be provided by the Email Administrator.
 - c. **(SMTP) Outgoing Mail Port:** By default the value is port 25, but many email providers are using a different port for security reasons. The correct port number should be provided by your Email Administrator.
 - d. **E-Mail Subject:** If an Email Subject is not provided when an error is generated this value will be used.
 - e. **(SMTP) Outgoing Mail Required Authentication:** Many email providers are requiring that you log into the Email Server to allow sending emails. If this is selected you must provide a valid Account Name and Password.
 - f. **Account Name:** The full email address for the sender's email account if authentication is required.
 - g. **Account Password:** The sender's account password. This should be left empty if authentication is not required.
 - h. **DIVArchive System Administrator's E-mail Address:** Enter the full email address for the DIVArchive System Administrator. This address will be used as the sender's email address if mail authentication is not required.
 - i. **Notification E-Mail Recipients:** Enter the full email addresses of all people who should receive the email notifications. This should be a comma-separated list with no spaces.

Figure 8: Configuration Utility – Manager Tab – Email Notifications

The screenshot shows the 'Manager Settings' window in the Configuration Utility. The window title is 'Configuration Utility - DIVArchive (User: DIVA700163, connected to database on 172.16.3.203:1521)'. The breadcrumb trail is 'File Tools Help' > 'Objects, Groups & Media Mapping \ DIVAProtect \ Media \ Storage Plans \ Slots \ Manager Setting \ Licensing \'. The 'Manager Setting' tab is selected. The settings are as follows:

- Media/Storage Plan Submission Database:** 500,000
- Maximum Number of Records in DP_Or...** 500,000
- Complex Objects Metadata Database Loc...** G:\FBM
- Enable Metadata Database Feature:** ☒
- Database Backup Notification:** ☒
- Enable E-Mail Notification:** ☒
- (SMTP) Outgoing Mail Host:** mailtest.net
- (SMTP) Outgoing Mail Port:** 26
- E-Mail Subject:** DIVArchive System Error Notification
- (SMTP) Outgoing Mail Required Authentication:** ☒
- Account name (Full Email Address):** info@test.net
- Account Password:** *****
- DIVArchive System Administrator E-Mail Address:** admin@test.net
- Notification EMail Recipients (comma delimited):** admin@test.net

Callouts with arrows point to the following fields:

- 'Enter the valid SMTP Port.' points to the '(SMTP) Outgoing Mail Port' field.
- 'Check this box to enable email notifications.' points to the 'Enable E-Mail Notification' checkbox.
- 'Enter the SMTP mail host name.' points to the '(SMTP) Outgoing Mail Host' field.
- 'Enter a default Email Subject.' points to the 'E-Mail Subject' field.
- 'Check this box if the SMTP Server requires Authentication.' points to the '(SMTP) Outgoing Mail Required Authentication' checkbox.
- 'Enter the Account Name.' points to the 'Account name (Full Email Address)' field.
- 'Enter the Account Password.' points to the 'Account Password' field.
- 'Enter the System Administrator's Email Address.' points to the 'DIVArchive System Administrator E-Mail Address' field.
- 'Enter the all notification recipient's email addresses in a comma-separated list.' points to the 'Notification EMail Recipients (comma delimited)' field.

Table 4: Default Backup Service Configuration File Parameters

Parameter	Default Value or Required Setting
DIVAMANAGER_HOST	The default value is: localhost
DIVAMANAGER_PORT	The default value is: 9000
SERVICE_NAME	The default value is: DIVArchive Backup Service.
SERVICE_PORT	The default value is: 9300. This should be changed if it conflicts with other services.
DIVAMANAGER_DBHOST	IP Address of the database the DIVArchive Manager is connected to.
DIVAMANAGER_DBPORT	Port number of the database the DIVArchive Manager is connected to. The DIVArchive Database installation uses Oracle's default of 1521.
DIVAMANAGER_DBUSER	The database username (<i>usually diva</i>).
DIVAMANAGER_DBSID	Oracle Database SID to which DIVArchive Manager is connected to.

Parameter	Default Value or Required Setting
DIVAMANAGER_DB_SYS_PASSWORD	The database system administrative password.
BACKUP_SERVICE_MANAGE_DATABASE_BACKUPS	Enables or disables backup of the DIVArchive Database. The default value is Y (Yes/enabled).
BACKUP_SERVICE_MANAGE_METADATA_BACKUPS	Enables or disables backup of the Metadata Database. The default value is Y (Yes/enabled).
SCRIPT_FILES_DIRECTORY	The DIVArchive Oracle Database Backup Script Location. The scripts are by default copied to DIVA_HOME\Program\DBBackup\rman\bin during the DIVArchive 7.4 installation. This parameter accepts both relative path and absolute path. If the relative path is used the current directory must be assumed as DIVA_HOME\Program\DBBackup\bin . The default value is ../rman/bin .
CYGWIN_BIN_DIRECTORY	Location of the CYGWIN installation. The default is C:/cygwin/bin .
DB_BACKUP_LOCATION	Location of Oracle Database backup files.
DB_BACKUP_REMOTE_DESTINATIONS	<p>Location of the Oracle database remote backup destination(s). All remote destinations must be an RSYNC Service Module Name following by a Folder Name. The backups must not be copied to the root of the RSYNC module. Multiple destinations are allowed and must be delimited by commas.</p> <p>The default is: <code>rsync://manager2/oraback/mgr1,rsync://actor3/oraback/mgr1</code></p> <p>Syntax: <code>rsync://172.16.3.45/Module_Name/Folder_Name</code></p> <p>Example: <code>rsync://172.16.3.45/ ORACLE_BACKUP/lib5</code></p> <p>Also refer to Section 0 for more information.</p>
FULL_BACKUP_START_HOUR_24	The hour of day to perform a full database backup when the service is initially started. If the service is started later than the configured value, the full backup will occur at this hour on the following day. The default is Midnight; "0" hours.
FULL_BACKUP_START_MINUTE	Minutes after the FULL_BACKUP_START_HOUR_24 hour to start the full backup. The default is "0" Minutes.
FULL_BACKUP_FREQUENCY_HOURS	The frequency to execute a full backup of the database. The default is every 24 hours.

Parameter	Default Value or Required Setting
INCREMENTAL_FREQUENCY_MINUTES	<p>The frequency to execute an incremental backup of the database. The default is every 15 minutes.</p> <p>The Backup Service will automatically determine if a full backup is required.</p> <p>If the FBM_FREQUENCY_MINUTES parameter is not set then this value is also used to notify the DIVArchive Manager how often to expect a message from the DIVArchive Backup Service. If a message is not received by the Manager within the incremental minutes, all Connected Control GUIs will be notified that the DIVArchive Backup Service may not be running and the event will be recorded in the Events Log. If the FBM_FREQUENCY_MINUTES is set, the lowest parameter value will be used to notify the DIVArchive Manager how often to expect a message from the DIVArchive Backup Service.</p> <p>By default, Manager expects a message from the Backup Service within 15 minutes after the start of the Manager Service. Once the Backup Service is started and connected to the Manager, the Manager expects a message within every INCREMENTAL_FREQUENCY_MINUTES or FBM_FREQUENCY_MINUTES value that is identified in the Backup Configuration File.</p>
FBM_BACKUP_REMOTE_DESTINATIONS	<p>Location of Metadata database remote backup destination(s). All remote destinations must be an RSYNC Service Module Name followed by a Folder Name. The backups must not be copied to the root of the RSYNC module. Multiple destinations are allowed and must be delimited by commas.</p> <p>The default is:</p> <pre>rsync://manager2/oraback/mgr1,rsync://actor3/oraback/mgr1</pre> <p>Syntax : rsync://172.16.3.45/Module_Name/Folder_Name</p> <p>Example : rsync://172.16.3.45/ META_BACKUP/FBM</p> <p>Also refer to Section 0 for more information.</p>

Parameter	Default Value or Required Setting
FBM_FREQUENCY_MINUTES	<p>The frequency to execute a Metadata Database Backup to all Remote Metadata Backup Destinations. The default value is every 15 minutes.</p> <p>If INCREMENTAL_FREQUENCY_MINUTES is set, the lowest parameter value will be used to notify the DIVArchive Manager how often to expect a message from the DIVArchive Backup Service.</p> <p>Note: A Metadata Database backup will be executed at the start-up of the service.</p>
DB_FBM_RECOVERY_WINDOW_DAYS	<p>This parameter represents the Recovery Window Period for the Oracle and Metadata Databases. This is how many days of backup that the Backup Service must retain and then delete the obsolete backup copies. The default is 10 days.</p> <p>The DIVArchive Backup Service calls the RMANRecoveryWindow.bat batch file included in the bin folder of the DIVArchive Backup Service to set this value.</p> <p>Note: If this batch file is missing the DIVArchive Backup Service will not start.</p>
CLEANUP_START_HOUR_24	<p>The hour of the day for initial start-up of the Backup Service clean-up process to delete the obsolete backup copies. The default is 2 (2:00 AM).</p>
CLEANUP_START_MINUTE	<p>The number of minutes after CLEANUP_START_HOUR_24 to start the clean-up process. The default is 0 (<i>top of the hour</i>).</p>
CLEANUP_FREQUENCY_HOURS	<p>The frequency to run the clean-up process. The default is every 24 hours.</p>

4.3 Installing the DIVArchive Backup Service

After verification of the DIVArchive Backup Configuration File parameters, the DIVArchive Backup Service must be installed and started using the following procedure:

1. All the Prerequisites are in place. Refer to Section 4.1 for more details.
2. In Windows, select **Start, Run**, and open a command line window (*cmd*).
3. Change to the proper folder by executing:

```
CD <DIVA_HOME>\Program\DBBackup\bin
```

4. The command line syntax for the `dbbackup.bat` file is as follows:

```
dbbackup command [options]
```

Table 5: *dbbackup.bat* Command Line Options

Command	Definition
install (-i)	Installs the DIVArchive Backup Service as a Windows Service. The Backup Service must be installed on the same server where the Manager and Oracle Database are installed.
uninstall (-u)	Uninstalls DIVArchive Backup Service Windows Service.
start	Starts the DIVArchive Backup Service. If the service fails to start, refer to Section 0.
stop	Stops the DIVArchive Backup Service.
restart	Stops and subsequently restarts the service.
reconcile	This command lists the Complex Objects that are missing the Metadata Database Files.
status	<p>This will return the current version of DIVArchive Backup Service, the IP and port that it is installed on, and the state of the service. Current states are Running and Not Running.</p> <p>If the state is Not Running after an attempt to start has failed, a review of the logs will be required to determine why the service could not start.</p> <p>Examples:</p> <pre>Service (on 127.0.0.1:9300) is running.</pre> <pre>Service (on 127.0.0.1:9300) is not running.</pre> <p>Refer to Section 0 for more information about enhanced <code>status</code> output information.</p>
version (-v)	Displays the version information and then exits.
help (-h)	Displays help information and then exits.

Table 6: *dbbackup.bat* Command Line Commands

Option	Description
-conf (-f)	Identifies the configuration file to load the settings from. The default is <code>DIVA_HOME\Program\conf\db_backup\backup.conf</code> .

Note: The DIVArchive Backup Service doesn't support having the Manager and Oracle Database installed on separate machines in the DIVArchive 7.4 release.

4.4 Windows RSYNC Service Installation and Module Configuration

The DIVArchive Backup Service incrementally replicates Oracle Database Backup Files and Metadata Files to remote backup servers. Once CYGWIN is installed, the RSYNC Service and RSYNC Modules must be installed. The RSYNC Modules provide a logical name for the backup location path. The DIVArchive Manager Server, DIVArchive Backup Manager Server, DIVArchive Database Server, and all Remote Backup Systems must have the following setup:

Note: The DIVArchive Prerequisite Package takes care of installing CYGWIN and the RSYNC Configuration. The following steps only need to be performed when the DIVArchive Prerequisite Package is not used for Installing CYGWIN.

1. Run the following command to install the RSYNC Service if not already installed:

```

CYGWIN_HOME\bin\cygrunsrv -I rsyncd -d "RSYNC Daemon" --
path /usr/bin/rsync --args '--config=/etc/rsyncd.conf --
no-detach --daemon --quiet' -e CYGWIN='binmode tty
nontsec'

```

2. Add a new module to `rsyncd.conf`:
 - a. Open `CYGWIN_HOME\etc\rsyncd.conf` to add the following:

```

[Module Name]
path = <cygwin style path>
comment = <Description>

```

Example:

```

[ORACLE_BACKUP]
path = /cygdrive/h/oraback
comment = Oracle backups

```

```

[METADATA_BACKUP]
path = /cygdrive/h/metaback
comment = Metadata Database backups

```

It is recommended to configure RSYNC modules to the same directory on Main and all Remote Backup Servers.

Note: The square brackets “[” are required for the [Module Name] statement above in rsyncd.conf. Therefore, in the example, [ORACLE_BACKUP] must include the brackets.

3. Start the RSYNC Service from the Windows Service Manager, or from the command line execute:

```
CYGWIN_HOME\bin\cygrunsrv -S rsyncd
```

4.5 Linux RSYNC Service Installation and Module Configuration

RSYNC for Linux is added as part of the divaservice. The following is the divaservice usage:

```
[diva@linux008 Program]$ ./divaservice
```

```
runuser: user oracle does not exist
```

```
Warning: Unable to get Oracle SID
```

```
Usage ./divaservice configure <SERVICE>
```

```
Usage ./divaservice install <SERVICE> <configuration file as absolute path>
```

```
Usage ./divaservice start-all | stop-all | restart-all
```

```
Usage ./divaservice start | stop | restart | uninstall | status  
<SERVICE_NAME>
```

```
Usage ./divaservice list
```

```
Usage ./divaservice profile
```

```
SERVICE: manager actor robotmanager migrate dfm dbbackup lynxlocaldelete spm  
rsyncDaemon
```

Example:

```
Install : sh divaservice install rsyncDaemon  
/home/diva/DIVA/7_4_0_35/Program/conf/rsync/rsync.conf
```

```
Start : sh divaservice start rsyncDaemon
```

5 Operations

5.1 Metadata Database Configuration

To enable Complex Objects workflows and Metadata Database backups, two parameters must be set in the Configuration Utility's Manager Setting Tab:

- **Enable Metadata Database**
 - Check this box to enable use of the Metadata Database.
- **Metadata Database Location**
 - Set this to an existing empty directory in the file system.

Refer to Section 0 for more information.

It is highly recommended that the Metadata Database Files be stored on a RAID Disk Array. The Metadata Database should not be on a standard disk due to decreased performance and the (*real-time*) backup functionality that a RAID Array offers the system.

Metadata Database Files stored on a standard disk will be vulnerable to data loss in the event of a single disk failure until the information is replicated via the DIVArchive Backup Service. Storing the Metadata Database Files on a RAID Array isolates the data from this type of failure.

Note: Changes made to these parameters require the Manager and Backup Service to be restarted. When changing the Metadata location is required, make sure to copy all of the Metadata Files from the old location to the new location.

5.2 Metadata Database Sizing

What is the **MINIMUM** amount of disk space required to support the Complex Object Metadata Database? The following formula can be used as a rough guide:

$$(100 + \text{average_path_filename_size}) * 1.15 * \text{avg_num_component_files} * \text{num_objs}$$

When planning, enough Metadata Database disk space should be allocated to ensure (un)expected growth of the customer environment. **The same disk space must be allocated for the Metadata Database on all of the Remote Backup Systems.**

Example:

- `average_path_filename_size = 60`
 - `this/nested/subdir01/As_The_World_Turns_24fps_scenes1-10.avi`
- `avg_num_component_files = 200,000`
 - The Average Number of Files and Folders within the Complex Object.
- `num_objs = 50,000`
 - The Number of Complex Objects to be archived.

In this example, the **MINIMUM** budgeting for a Metadata Database size of around 1.67TB would be recommended.

5.3 Recovery Window

The Recovery Window defines how much history (*days*) of backups the DIVArchive Backup Service should retain and delete the obsolete backups (*outside of the Recovery Window range*). Preserving considerable days of backups is very important as this allows the flexibility to roll back the system to any state in the past if a situation arises.

The Recovery Window value is configured using the `DB_FBM_RECOVERY_WINDOW_DAYS` parameter in the configuration file. The default value is 10 days

When a Complex Object is deleted, the Manager will only delete the entries in the Oracle Database and will retain the Complex Object's Metadata File in the Metadata Database until the end of the Recovery Window period.

Example:

1. Assuming that the current Recovery Window is 10 days and the Backup Service clean-up is scheduled to run every day at 2 AM.

```
DB_FBM_RECOVERY_WINDOW_DAYS = 10
CLEANUP_START_HOUR_24 = 2
CLEANUP_START_MINUTE = 0
CLEANUP_FREQUENCY_HOURS = 24
```

2. *Complex Object A* is deleted on September 10, 2011 at 10 AM. Only the entries in the Oracle Database are deleted and the Complex Object's Metadata File is retained on the Metadata Database Location.
3. The Backup Service keeps track of the time and date of deleted Complex Objects until the end of the Recovery Window.
4. On September 21st while running the clean-up task at 2 AM, the DIVArchive Backup Service will detect that the recovery period of 10 days has expired since the deletion of *Complex Object A* and will delete its corresponding Metadata File from the Metadata Database.
5. The DIVArchive Backup Service will retry failed Metadata File deletions again during the next execution.

5.4 Backup Clean-up

It is impossible to preserve all of the backups and therefore any backups beyond the Recovery Window must be deleted to clean up disk space. The DIVArchive Backup Service checks for obsolete backups that were created beyond the Recovery Window every 24 hours by default and deletes them. The cleaning of obsolete backups works differently for the Oracle Database and Metadata Database as explained below.

5.5 Backup Interval Overrun

A **Backup Interval Overrun** will happen if a specific backup is taking a longer time to complete beyond the next scheduled iteration.

Example:

1. Let's assume the Oracle Incremental Backup is schedule to run every 15 minutes.
`INCREMENTAL_FREQUENCY_MINUTES = 15`
2. Time 12.00 PM → Incremental backup started.
3. Time 12.15 PM → Incremental backup is still running and not completed.

The above situation is called a **Backup Interval Overrun** as the Backup Service must run the next incremental backup by 12.15 PM, but it cannot because the one started at 12.00 PM is still running.

DIVArchive Backup Service sends a **Backup Time-Out Warning Message** to the Manager when a Backup Interval Overrun occurs and Manager will broadcast this warning to all connected Control GUIs. Manager also records the warning in the Events Logs. If a Backup Time-Out occurs three consecutive times, the Time-Out messages will be elevated to an error message. **The user must take immediate and necessary action to modify the backup's frequency by updating the configuration file to avoid future Backup Interval Overrun occurrences.**

Note: Updating the configuration file requires a Backup Service restart.

5.6 Recommended Practices

The recommended practices for the DIVArchive Backup Service are:

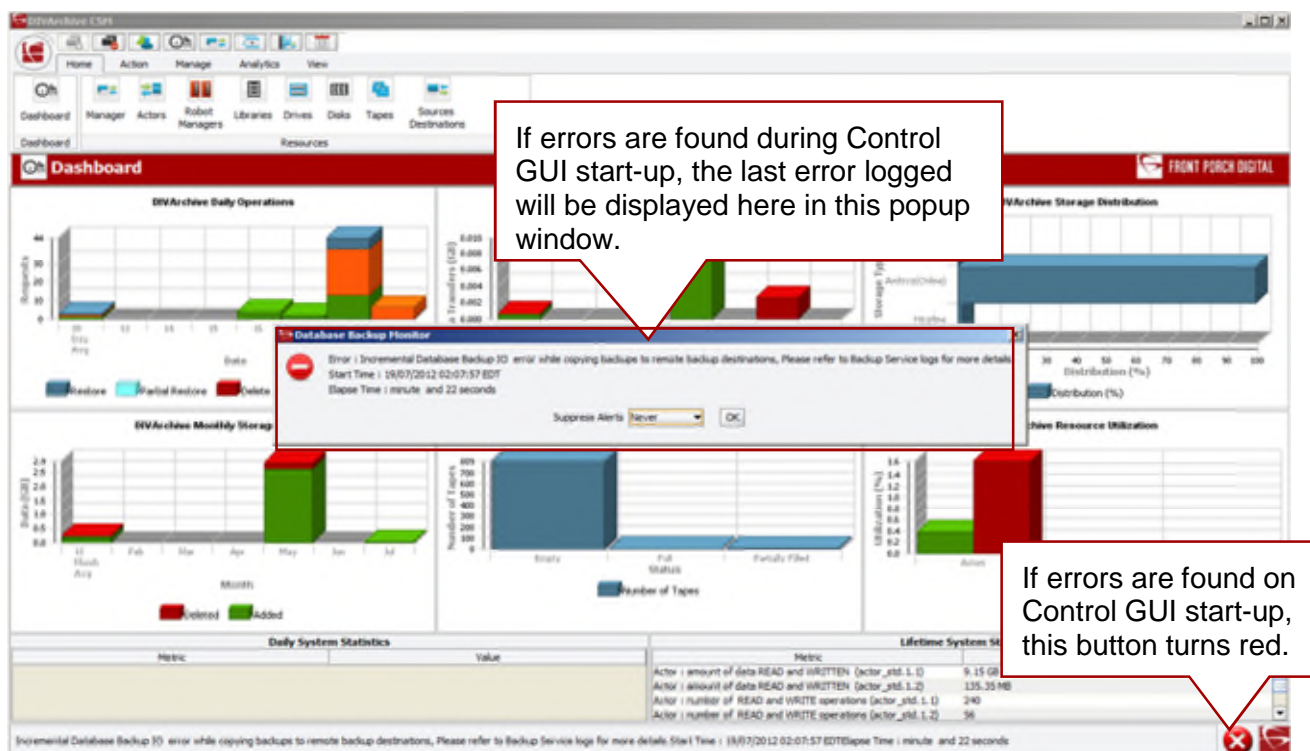
- It must be installed on the same server as the DIVArchive Manager and Oracle Database.
- **At least two (2) Backup Systems are always required to store the backups.** Oracle DIVArchive Actor machines may serve dual purposes and be used as backup machines as well as Actor machines.
- Oracle Incremental backups should be performed every 15 minutes.
- Metadata Database backups should be performed every 15 minutes.
- Backup Recovery Window should be set to value greater than, or equal to, 10 days.
- Backup Clean-up function should be performed every 24 hours.
- Oracle Full Backups should be performed every 24 hours.
- If required, restoration of a system backup should only be performed by Oracle Support Personnel.
- Oracle Database Data Files, Oracle Database Backups, and the Metadata Database must be stored on RAID disk array.
- Allocate equal backup disk space on Main and all Backups Systems.

5.7 Monitoring the DIVArchive Backup Service

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.

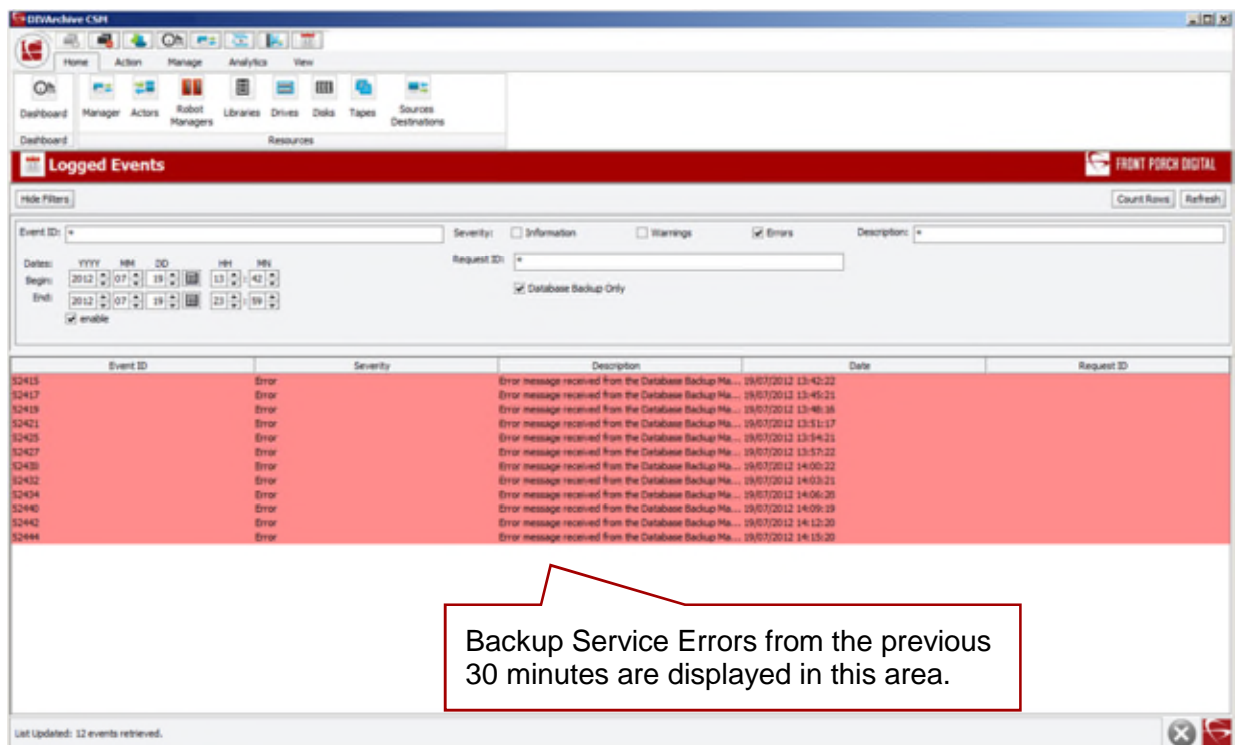
On Control GUI startup, the system will query the logged events to determine if there are any Backup Service Errors within the last 24 hours. If an error is detected, the **Error Icon** on the bottom right of the Control GUI will be enabled (*red in color*) and when clicked will display all errors generated in the last 24 hours in the Manager Events Panel. If pop-up messages are enabled (*in the Configuration Utility*), and an error is detected, the last error in the logged events will be displayed as shown in the figure below.

Figure 9: DIVArchive Control GUI Displaying Error Window



When an error notification is received by the Control GUI, the **Error Icon** will flash 10 times indicating arrival of a new error message. If the error received is a backup Service Error, the icon will flash continually. Clicking on the Error Icon will open the Events in the Manager Panel and display only the Backup Service errors received within the last 30 minutes, and reset the **Error Icon** (*it will stop flashing*). Additionally, the Status Bar at the bottom of the Control GUI screen will display the incoming Error, Warning and Info messages.

Figure 10: Logged Events Database Displaying Backup Service Errors



The following are the different warning and error notifications shown on the Control GUIs.

Table 7: DIVArchive Backup Service Errors and Warnings

Message Type	Code	User Message	Posted to Manager
SUCCESS	0	Completed successfully	Yes – Information
RUN	1	Running	No – Internal
ERROR	2	Failure: Refer to the Backup Service logs for more details.	Yes – Error
TIMEOUT	3	Timeout: The process is taking longer to complete than the configured intervals.	Yes – Warning
STARTUP_FAILURE	4	DIVArchive Backup Service failed to start. Refer to the Backup Service logs for more details.	Yes – Error
INITIALIZE	5	Scheduling Backups	No – Internal

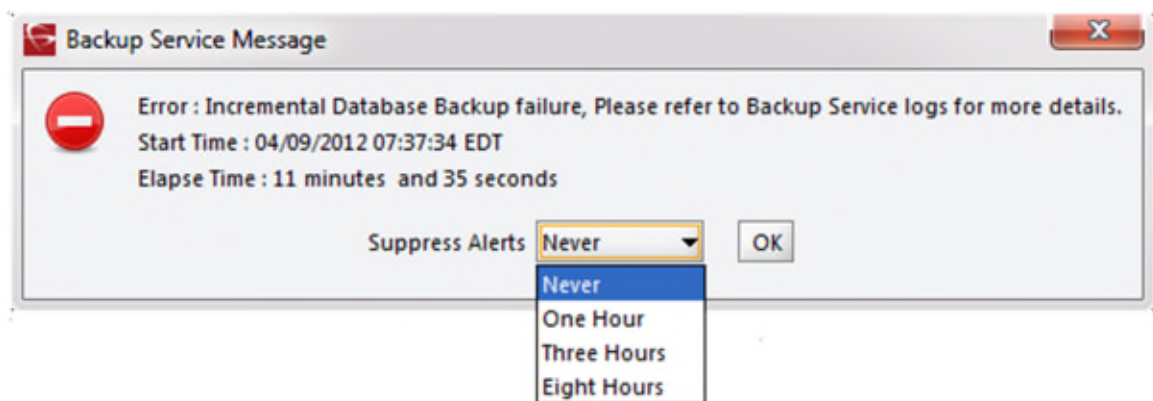
Message Type	Code	User Message	Posted to Manager
TIMEOUTERROR	6	Timeout: The process is taking longer to complete than the configured interval.	Yes - Error
CONFIGERROR	1000	Invalid Configuration Error. Refer to the Backup Service logs for more details.	Yes – Error
METADATALOCATIONERROR	6000	The Metadata Database Locations does not exist. Refer to the Backup Service logs for more details.	Yes – Error
CLEANUPFBMFILEERROR	7000	The Metadata Database file deletion failed. Refer to the Backup Service logs for more details.	Yes – Error
CLEANUPFBMFILEWARNING	7001	Failed deleting the Metadata Database.	Yes – Error
RSYNCERROR	8000	An error occurred while copying backups to remote backup destinations. Refer to the Backup Service logs for more details.	Yes – Error
RSYNCIOERROR	8002	An I/O error occurred while copying backups to remote backup destinations. Refer to the Backup Service logs for more details.	Yes – Error
RSUNCTIMEOUTWARNING	8003	A timeout occurred while copying backups to remote backup destinations. Refer to the Backup Service logs for more details.	Yes - Warning
RSYNCTIMEOUTERROR	8005	A timeout occurred while copying backups to remote backup destinations. Refer to the Backup Service logs for more details.	Yes - Error

Message Type	Code	User Message	Posted to Manager
DBCONNECTERROR	9000	Database connection error. Refer to the Backup Service logs for more details.	Yes - Error
SQLERROR	9001	Database SQL error. Refer to the Backup Service logs for more details.	Yes - Error
DBROLLBACKERROR	9002	Database Rollback error. Refer to the Backup Service logs for more details.	Yes - Error

Note: Error messages are prefixed with the process that generated the error/warning, and where applicable, post fixed with the start of the process and elapsed time. Elapsed time being the time the process ran before generating the error.

On connected Control GUIs a popup window is displayed (*shown below*) with the specific error or warning message from the table above.

Figure 11: Control GUI Popup Message Window – Errors and Warnings



Using the pull-down item next to Suppress Alerts, the system will *snooze* the specific message type displayed in the popup window and suppresses future messages for the same error/warning. *Snoozing* a message window has no effect on the currently displayed error/warning; only on future messages about the same error/warning that has been *snoozed*.

Note: Restarting the Control GUI will reset the error/warning snooze function.

The Backup Service will continue to display timeout messages as a warning. If the timeout occurs three (3) consecutive times, the message will be elevated to an error message and displayed.

All messages generated by the Backup Service are also written to the **Database Events Log** and marked as **Backup Service Messages**. In this manner, if no Control GUI is connected, all of the backup errors and warnings can be reviewed by navigating to the **Events Panel** under the **Analytics Menu** in the **Control GUI**.

Figure 12: DIVArchive Control GUI – Analytics Tab Logged Events

Logged Events

Event ID: Severity: ☒ Information ☒ Warnings ☒ Errors Description:

Request ID:

☒ Database Backup Only

Hide Filters

Event ID Severity Description

99293	Warning	Time out waiting for a status message from the Database Backup Manager.
99294	Warning	Time out waiting for a status message from the Database Backup Manager.
99295	Warning	Time out waiting for a status message from the Database Backup Manager.
99296	Warning	Time out waiting for a status message from the Database Backup Manager.
99297	Warning	Time out waiting for a status message from the Database Backup Manager.
99298	Warning	Time out waiting for a status message from the Database Backup Manager.
99299	Warning	Time out waiting for a status message from the Database Backup Manager.
99300	Warning	Time out waiting for a status message from the Database Backup Manager.
99301	Warning	Time out waiting for a status message from the Database Backup Manager.
99302	Warning	Time out waiting for a status message from the Database Backup Manager.
99303	Warning	Time out waiting for a status message from the Database Backup Manager.
99304	Warning	Time out waiting for a status message from the Database Backup Manager.
99305	Warning	Time out waiting for a status message from the Database Backup Manager.
99306	Warning	Time out waiting for a status message from the Database Backup Manager.
99307	Warning	Time out waiting for a status message from the Database Backup Manager.
99308	Warning	Time out waiting for a status message from the Database Backup Manager.
99451	Error	Error message received from the Database Backup Manager: METADATA Database Replication error while copying RL...
99452	Error	Error message received from the Database Backup Manager: METADATA Database Replication error while copying RL...
99453	Error	Error message received from the Database Backup Manager: METADATA Database Replication error while copying RL...
99454	Error	Error message received from the Database Backup Manager: Incremental Database Backup failure. Please contact su...
99455	Error	Error message received from the Database Backup Manager: METADATA Database Replication error while copying RL...
99456	Error	Error message received from the Database Backup Manager: Incremental Database Backup failure. Please contact su...
99457	Error	Error message received from the Database Backup Manager: Incremental Database Backup failure. Please contact su...

List Updated: 3000 events retrieved.

Use the **Database Backup Only** checkbox to filter and display only Backup Service events.

Events may be filtered using the Filters to reduce the number of entries being viewed at one time. In the figure below, the screen has been filtered to show only Warnings and Errors. It is readily apparent that there are three warning events that have been logged about the Database Backup Manager timing out during an incremental backup attempt.

Figure 13: DIVArchive Control GUI – Analytics Tab Logged Events (Filtered)

SELECTING ONLY THESE CHECKBOXES FILTERS THE LOGGED EVENTS DISPLAY TO SHOW ONLY WARNINGS AND ERRORS.

THE LOGGED EVENTS RESULTS HAVE BEEN NARROWED HERE BY FILTERING THE EVENTS LOG FOR ONLY WARNINGS AND ERRORS.

THESE WARNINGS INDICATE A RECURRING TIMEOUT FROM THE DATABASE BACKUP MANAGER DURING AN ATTEMPT TO CREATE AN INCREMENTAL BACKUP.

Event ID	Severity	Description	Date
941262	Warning	Warning message received from the Database Backup Manager: Incremental Database Backup timeout, process is taking longer to complet...	01/03/2012 12:51:48
943536	Warning	Warning message received from the Database Backup Manager: Incremental Database Backup timeout, process is taking longer to complet...	01/03/2012 13:20:36
944733	Warning	Warning message received from the Database Backup Manager: Incremental Database Backup timeout, process is taking longer to complet...	01/03/2012 13:35:36

5.7.1 Minimum Disk Space Monitoring

A new parameter has been added to the DIVArchive Backup Service configuration. The `DISK_MIN_SPACE_THRESHOLD_PERCENT` is a notification threshold percentage of the available space for each drive accessible by the Manager. The default value is 5 percent.

Note: Removable media and/or drives are not monitored by this function.

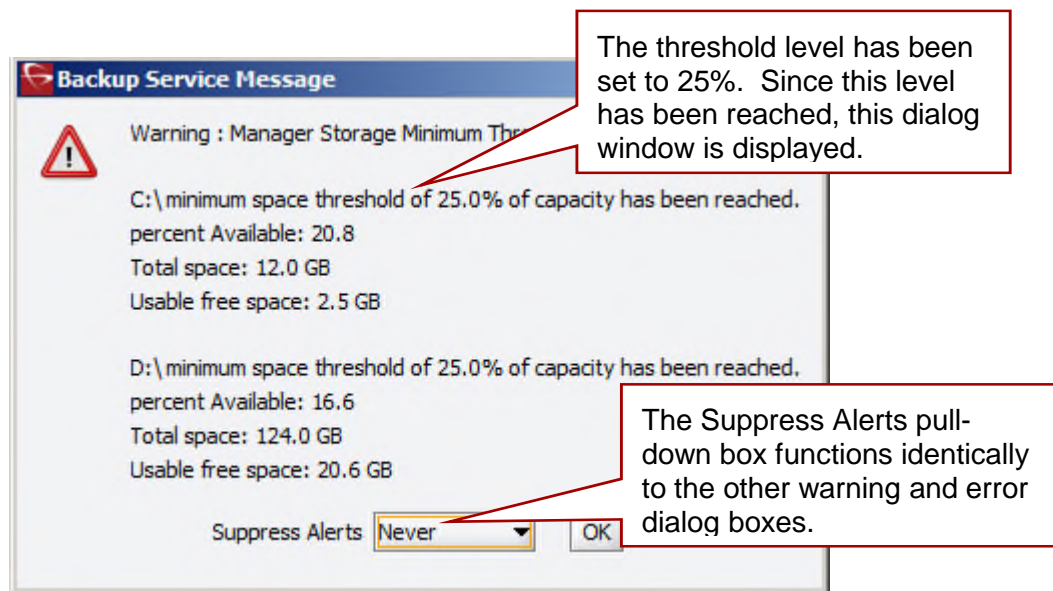
If the configured threshold of available space on the media is reached, warning notifications will be sent out. Once the available space reaches 80% of the designated percentage (*in the dbbackup.conf file*), an error message will be sent out.

Example:

```
DISK_MIN_SPACE_THRESHOLD_PERCENT=5
```

When the configured percentage is reached, a popup dialog window will be displayed as shown in the figure below.

Figure 14: Manager Storage Minimum Threshold Dialog Window



The dialog window has a Suppress Alerts pull-down box that functions identically to the other warning and error dialog boxes. In the figure above, a warning has been issued to notify the operator that the `DISK_MIN_SPACE_THRESHOLD_PERCENT` has been reached.

Snoozing this alert will cause no additional warnings or errors about the disk space to be displayed. Clicking the **OK Button** without setting a **Suppression Level** will allow future alerts about this warning to be displayed.

From Figure 10 above, when 80% of the threshold percentage is reached (2.4GB on C Drive and 24.8GB on D drive), this dialog will turn into an error rather than a warning.

Additionally, when the `dbbackup status` command is executed, additional information will be displayed as shown including the space available, threshold warnings and errors (*highlighted below*) and additional information about recent backup attempts.

```
Last process: METADATA Database Replication Start time:Thu Sep 06
13:26:30 EDT 2012
Last status: Completed Successfully.
Last Error:
```

System Statistics

```
OS: Windows 2003
Version: 5.2
: x86
Available processors (cores): 4
```

```
Total Free memory: 52 MB
Total used memory: 9 MB
```

```
Total available memory: 61 MB
```

Warning: D:\ minimum space threshold of 20.0% of capacity has been reached.

percent Available: 16.605641010200685

Total space: 124.037 GB

Free space: 20 GB

Usable space: 20.597 GB

Last Metadata Database Actions

No records found

No records pending deletion

Number of Database backup's performed in the last 24 hours is 89

Type	Status	Start	End
ARCHIVELOG	FAILED	2012-09-05 13:37:52.0	
2012-09-05 13:38:00.0	0.13		
ARCHIVELOG	FAILED	2012-09-05 13:52:50.0	
2012-09-05 13:53:00.0	0.16		
ARCHIVELOG	FAILED	2012-09-05 14:07:52.0	
2012-09-05 14:08:00.0	0.13		
DB FULL	COMPLETED	2012-09-05 19:38:48.0	
2012-09-05 19:45:24.0	6.6		
ARCHIVELOG	COMPLETED	2012-09-05 19:47:34.0	
2012-09-05 19:47:41.0	0.11		
ARCHIVELOG	COMPLETED	2012-09-05 20:02:43.0	
2012-09-05 20:02:53.0	0.16		
ARCHIVELOG	COMPLETED	2012-09-05 23:23:06.0	
2012-09-05 23:23:18.0	0.2		

5.7.2 Email Notifications

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**.

To enable this functionality (see the figure below):

1. Launch the **DIVArchive Configuration Utility**.
2. Connect to the appropriate database.
3. Select the **Manager Setting Tab**.
4. Set the required values for the **Email Notifications** parameters.
 - a. **Enable E-Mail Notification:** If selected Manager will attempt to send out email using the configured values.
 - b. **(SMTP) Outgoing Mail Host:** Provide the URL of the email provider for outgoing mail. This should be provided by the Email Administrator.

- c. **(SMTP) Outgoing Mail Port:** By default the value is port 25, but many email providers are using a different port for security reasons. The correct port number should be provided by your Email Administrator.
- d. **E-Mail Subject:** If an Email Subject is not provided when an error is generated this value will be used.
- e. **(SMTP) Outgoing Mail Required Authentication:** Many email providers are requiring that you log into the Email Server to allow sending emails. If this is selected you must provide a valid Account Name and Password.
- f. **Account Name:** The full email address for the sender's email account.
- g. **Account Password:** The sender's account password.
- h. **DIVArchive System Administrator's E-mail Address:** Enter the full email address for the DIVArchive System Administrator.
- i. **Notification E-Mail Recipients:** Enter the full email addresses of all people who should receive the email notifications. This should be a comma-separated list with no spaces.

Figure 15: Configuration Utility – Manager Tab – Email Notifications

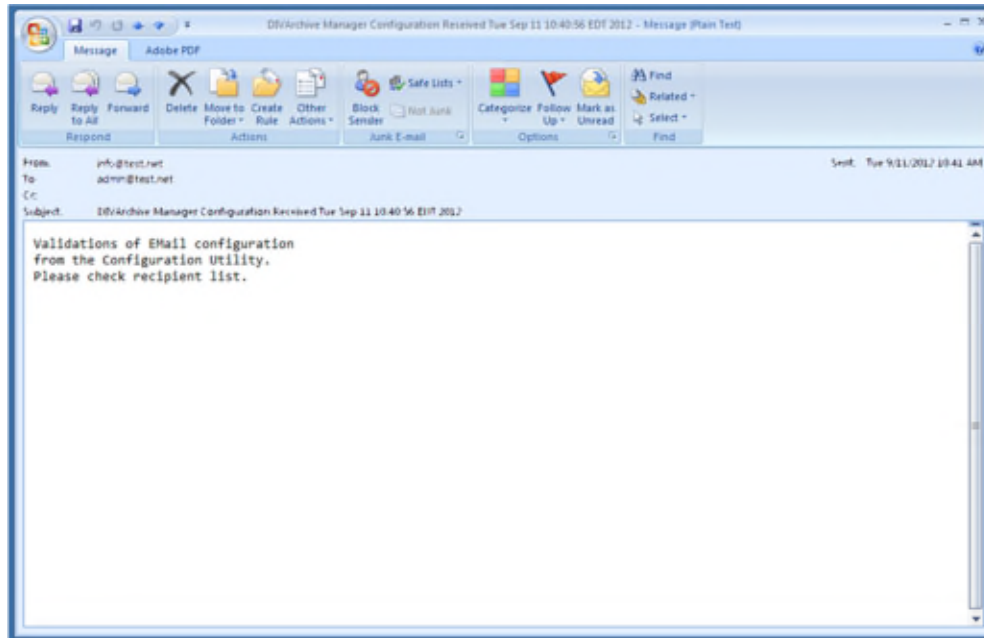
The screenshot shows the 'Manager Configuration' window in the Configuration Utility. The window title is 'Configuration Utility - DIVArchive (User: DIVA700163, connected to database on 172.16.3.203:1521)'. The 'Manager Setting' tab is selected. The following fields and their corresponding callouts are visible:

- Enter the valid SMTP Port.** Points to the '(SMTP) Outgoing Mail Port' field, which has the value '26'.
- Check this box to enable email notifications.** Points to the 'Enable E-Mail Notification' checkbox, which is checked.
- Enter the SMTP mail host name.** Points to the '(SMTP) Outgoing Mail Host' field, which has the value 'mailtest.net'.
- Enter a default Email Subject.** Points to the 'E-Mail Subject' field, which has the value 'DIVArchive System Error Notification'.
- Check this box if the SMTP Server requires Authentication.** Points to the '(SMTP) Outgoing Mail Required Authentication' checkbox, which is checked.
- Enter the Account Name.** Points to the 'Account name (Full Email Address)' field, which has the value 'info@test.net'.
- Enter the Account Password.** Points to the 'Account Password' field, which is masked with dots.
- Enter the System Administrator's Email Address.** Points to the 'DIVArchive System Administrator E-Mail Address' field, which has the value 'admin@test.net'.
- Enter the all notification recipient's email addresses in a comma-separated list.** Points to the 'Notification EMail Recipients (comma delimited)' field, which has the value 'admin@test.net'.

Note: If these parameters are miss-configured, notifications will go out to all connected Control GUIs and entries into the manager logs will be made.

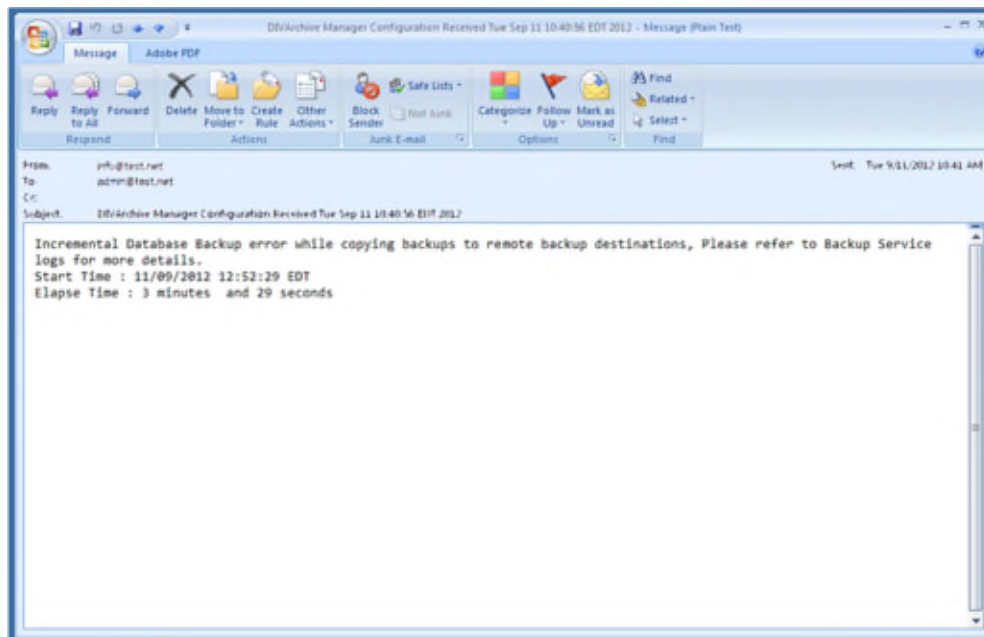
Once you have configured the values and the Manager is ready running you will need to notify the Manager. The Manager on start up or when it receives notifications from the Configuration Utility will read in the configured values and attempt to send out a test email. If the test is successful, all recipients will receive the following email message:

Figure 16: Test Email Message Sent by Manager



The following figure is an example of an error email message that would be sent to all recipients in the Recipient List:

Figure 17: Example Error Email Message



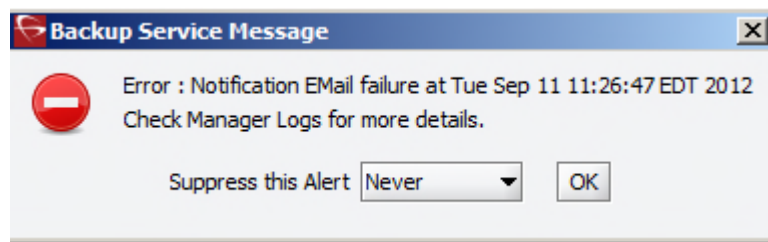
Events are logged in the **Logged Events Screen** of all connected Control GUIs. The following figure represents the **Events Log** indicating an email configuration error:

Figure 18: Example Control GUI Events Log



If the user is logged in as an Administrator in the Control GUI, they will receive the following pop up message:

Figure 19: Example Error Message Popup Dialog



5.8 DIVArchive Backup Service Status Command Enhancements

The Backup Service **status** command delivers comprehensive service status information and provides the information outlined in the following subsections. The command line syntax for the **dbbackup.bat** file using the **status** option is as follows:

```
dbbackup status
```

5.8.1 The Backup Service is Running Normally

When the Backup Service is running, the following information will be displayed when the **status** command option is executed:

- Running version of the service.
- IP and port that service is running on.
- System Statistics
- Operating System Information.
- Memory Information.
- Disk Array Information.

- Database Back up Statistics.
 - Last executed backup command and its status.
 - Number of Metadata Database base files backed up.
 - List of last 25 Metadata Files backed up with object name and date created.

Note: Information that is output to the console is also saved in the logs directory in a text file named `dbbackup.status`. This file along with the log files should be included when submitting customer support issues.

Figure 20: *status* Option Output for a Normal Running Backup Service

```

C:\DIVA\Program\BDBBackup\bin>dbbackup status
"config" is set to "C:\DIVA\Program\BDBBackup\bin\..\conf\db_backup\backup.conf"
DIVArchive BDBUP Service DIVA_7.0.0.0
Copyright (c) 1999-2012 Front Porch Digital.
All rights reserved.

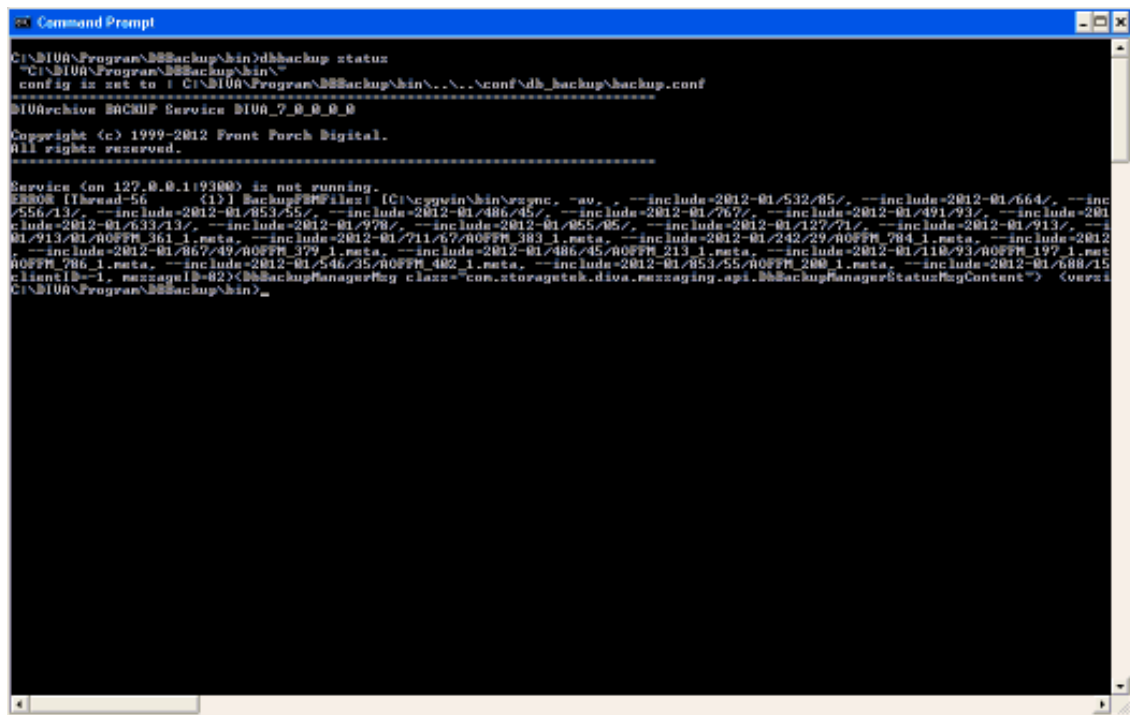
=====
Service (on 127.0.0.1:9300) is running.
Last process: METADATA Database Replication Start time: Wed Mar 21 11:26:58 EDT 2012
Last status: Running.
Last Error: METADATA Database Replication error while copying files to remote backup destinations.
Start Time: 21/03/2012 11:26:28 EDT
Elapsed Time: 22 seconds
System Statistics
OS: Windows XP
Version: 5.1
i x86
Available processors (cores): 4
Free memory: 61,477
Allocated memory: 63,360
Max memory: 1,013,632
Total free memory: 1,011,749
File system root: C:\
Total space (bytes): 320029192192
Free space (bytes): 144944703360
Usable space (bytes): 144944703360
File system root: D:\
Total space (bytes): 320062091264
Free space (bytes): 215713173504
Usable space (bytes): 215713173504
File system root: E:\
Total space (bytes): 0
Free space (bytes): 0
Usable space (bytes): 0
File system root: F:\
Total space (bytes): 0
Free space (bytes): 0
Usable space (bytes): 0
File system root: I:\
Total space (bytes): 0
Free space (bytes): 0
Usable space (bytes): 0
Backup Statistics
YOUR PATH
C:\DIVA\Program\BDBBackup\bin>
  
```

5.8.2 The Backup Service is Currently Stopped

When the Backup Service is **not** currently running, the following information will be displayed when the `status` command option is executed:

- Running version of the service.
- IP and port that service is running on.
- Extract from DIVArchive Backup Service log files from last error/fatal error reported.

Figure 21: *status* Option Output for a Stopped Backup Service

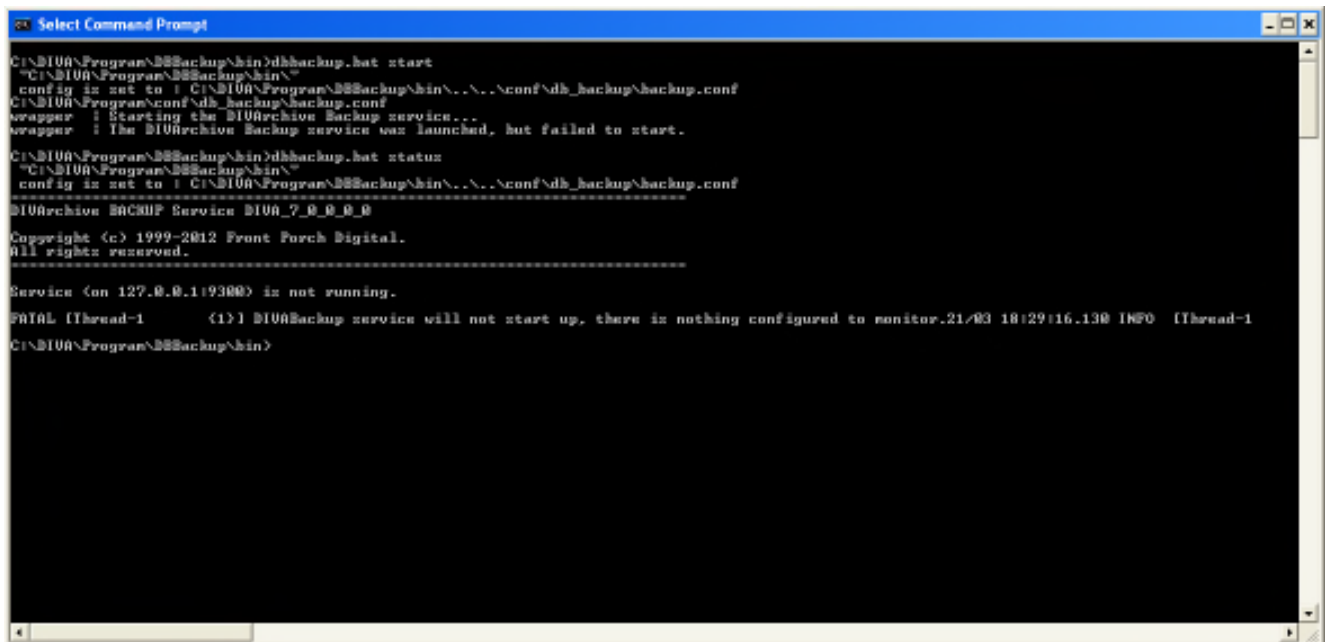


```
Command Prompt
C:\DIA\Program\BDBBackup\bin>dbbackup status
"C:\DIA\Program\BDBBackup\bin\"
config is set to ! C:\DIA\Program\BDBBackup\bin\..\conf\db_backup\backup.conf
=====
DIArchive BACKUP Service DIA_7_0_0_0_0
Copyright (c) 1999-2012 Front Porch Digital.
All rights reserved.
=====
Service (on 127.0.0.1:9300) is not running.
ERROR [Thread-56] (1) BackupFiles! (C:\cgwin\bin\cgenc, -av, --include=2012-01/532/85/, --include=2012-01/664/, --inc
/556/13/, --include=2012-01/853/55/, --include=2012-01/486/45/, --include=2012-01/767/, --include=2012-01/491/93/, --include=201
clude=2012-01/633/13/, --include=2012-01/290/, --include=2012-01/855/05/, --include=2012-01/127/71/, --include=2012-01/213/, --i
01/213/01/00FFM 361 1.meta, --include=2012-01/711/87/00FFM 383 1.meta, --include=2012-01/242/29/00FFM 784 1.meta, --include=2012
, --include=2012-01/867/49/00FFM 379 1.meta, --include=2012-01/486/45/00FFM 213 1.meta, --include=2012-01/110/93/00FFM 197 1.met
00FFM 786 1.meta, --include=2012-01/546/35/00FFM 402 1.meta, --include=2012-01/853/55/00FFM 200 1.meta, --include=2012-01/688/15
clientID=1, msgid=82)<DbBackupManagerMsg class="com.storagetek.dia.messaging.api.DbBackupManagerStatusMsgContent"> <ver
C:\DIA\Program\BDBBackup\bin>
```

5.8.3 The Backup Service Failed to Start

If the Backup Service fails to start, executing `dbbackup.bat` with the `status` option will show why the service failed to start. Below is a display of the status of a backup service that has failed to start.

Figure 22: *status* Option Output When the Backup Service Failed to Start



```
Select Command Prompt
C:\DIA\Program\BDBBackup\bin>dbbackup.bat start
"C:\DIA\Program\BDBBackup\bin\"
config is set to ! C:\DIA\Program\BDBBackup\bin\..\conf\db_backup\backup.conf
C:\DIA\Program\bin\cgenc -av --include=2012-01/532/85/, --include=2012-01/664/, --inc
C:\DIA\Program\bin\cgenc -av --include=2012-01/532/85/, --include=2012-01/664/, --inc
wrapper ! Starting the DIArchive Backup service...
wrapper ! The DIArchive Backup service was launched, but failed to start.

C:\DIA\Program\BDBBackup\bin>dbbackup.bat status
"C:\DIA\Program\BDBBackup\bin\"
config is set to ! C:\DIA\Program\BDBBackup\bin\..\conf\db_backup\backup.conf
=====
DIArchive BACKUP Service DIA_7_0_0_0_0
Copyright (c) 1999-2012 Front Porch Digital.
All rights reserved.
=====
Service (on 127.0.0.1:9300) is not running.
FATAL [Thread-1] (1) DIArchive service will not start up, there is nothing configured to monitor.21/03 18:29:16.130 INFO [Thread-1
C:\DIA\Program\BDBBackup\bin>
```

5.9 Failure Scenarios and Recovery Steps

Failure scenarios are categorized as two types:

- Non Failover Scenarios
- Failover Scenarios

5.9.1 Non Failover Scenarios

If the Main DIVArchive Manager machine is still fully operational and there has been no RAID Disk failure, the DIVArchive System and its database can be restored and recovered from failure without moving the DIVArchive Manager or Database to a Backup DIVArchive Manager machine.

Table 8: Non Failover Scenarios and Recovery Actions

Failure Scenario	Possible Recovery Actions
Manager Crash	<ul style="list-style-type: none">• Restart Manager.• Apply Cumulative Patch and restart Manager.• DIVArchive Upgrade.
Oracle Database Instance Failure	<ul style="list-style-type: none">• Restart Oracle Instance.• Reinstall Oracle and restore Database from backup.
Oracle Database Data File Corruption	Restore data file from Oracle backup.
Oracle Database Parameter File or Control File Corruption	Restore parameter file/control file from Oracle backup.
Oracle Online Redo Logs Corruption	Restore the database using Oracle backup.
Oracle Archive Redo Logs Corruption	Shut down the database and perform full backup.
Replication (RSYNC) of RMAN Backup Files Failure	DIVArchive Backup Service sends a Failure Notification to Manager. Manager generates error events and broadcasts messages to all connected Control GUIs and records it in the event logs. The Control GUIs display popup notifications indicating the need for user action. The possible causes could be network issues, the Remote Backup System is unavailable, or the RSYNC Service is not running on the Remote Backup System.

Failure Scenario	Possible Recovery Actions
Replication (RSYNC) of Metadata Database Files Failure.	DIVArchive Backup Service sends a Failure Notification to Manager. Manager generates error events and broadcasts messages to all connected Control GUIs and records them in the event logs. The Control GUIs display popup notifications indicating the need for user action. The possible causes could be network issues, the Remote Backup System is unavailable, or the RSYNC Service is not running on the Remote Backup System.

5.9.2 Failover Scenarios

If the main DIVArchive Manager Machine has failed, is not operational, or there is a RAID Disk failure, the DIVArchive Manager and Database must be restored and recovered on the Backup DIVArchive Manager Machine to recover DIVArchive back to an operational state.

Table 9: Failover Scenarios and Recovery Actions

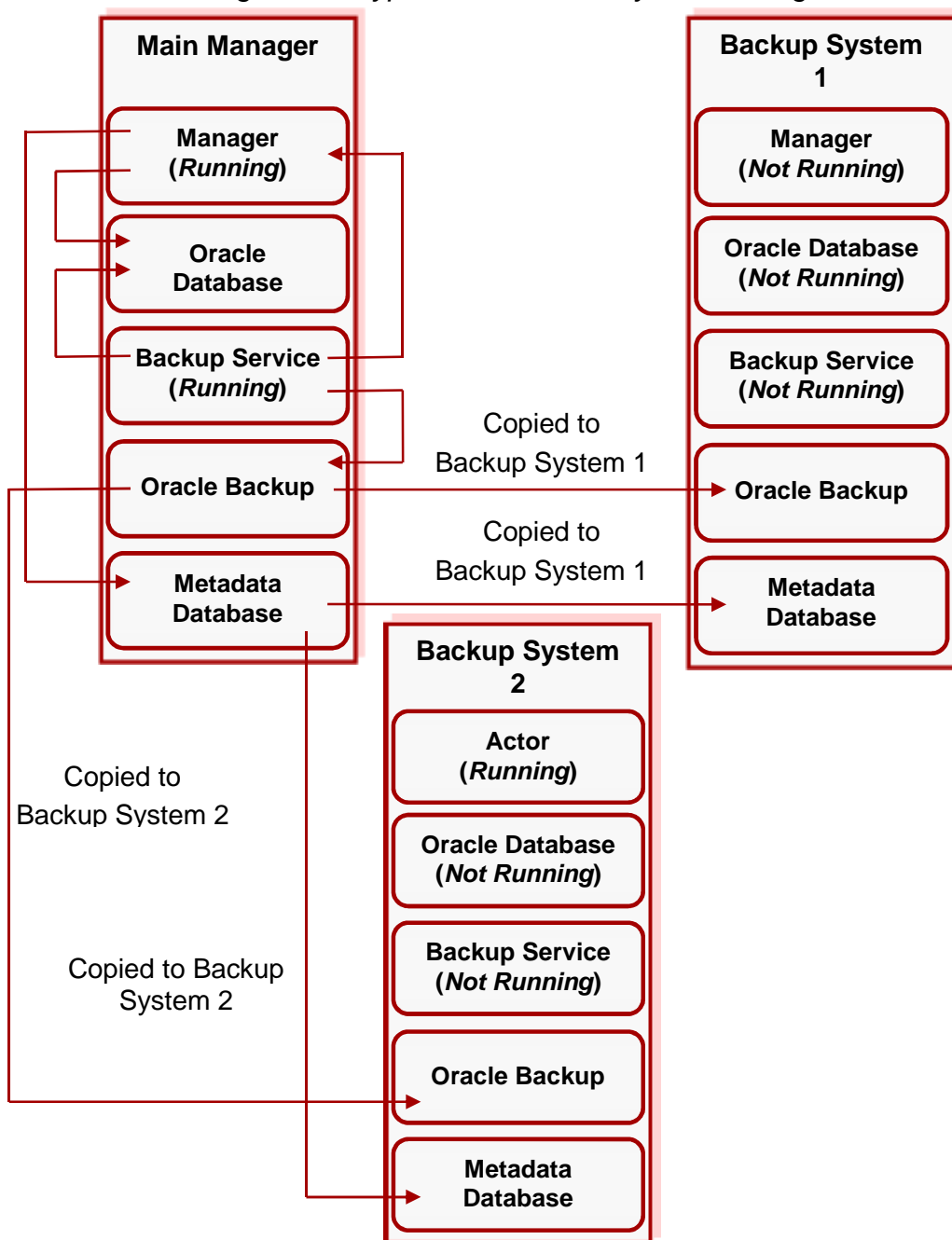
Failure Scenario	Recovery Actions
Main DIVArchive Manager Machine Crash.	<ul style="list-style-type: none"> • Failover to Backup DIVArchive Manager Machine. • Restore and recover the Oracle Database from Oracle backups. • Execute <code>dbbackup.bat reconcile</code> to find out if any Complex Objects are missing Metadata Files. • Start DIVArchive Manager.
RAID Disk Failure where Oracle Data Files are Stored.	<ul style="list-style-type: none"> • Failover to Backup DIVArchive Manager Machine. • Restore and recover the Oracle Database from Oracle backups. • Execute <code>dbbackup.bat reconcile</code> to find out if any Complex Objects are missing Metadata Files. <p>Start DIVArchive Manager.</p>

Failure Scenario	Recovery Actions
RAID Disk Failure where Oracle RMAN Backups are Stored.	<ul style="list-style-type: none"> • Failover to Backup DIVArchive Manager Machine. • Restore and recover the Oracle Database from Oracle backups. • Execute <code>dbbackup.bat reconcile</code> to find out if any Complex Objects are missing Metadata Files. <p>Start DIVArchive Manager.</p>
RAID Disk Failure where Metadata Database Files are Stored.	<ul style="list-style-type: none"> • Failover to Backup DIVArchive Manager Machine. • Restore and recover the Oracle Database from Oracle backups. • Execute <code>dbbackup.bat reconcile</code> to find out if any Complex Objects are missing Metadata Files. • Start DIVArchive Manager.

5.9.3 Failover Procedure

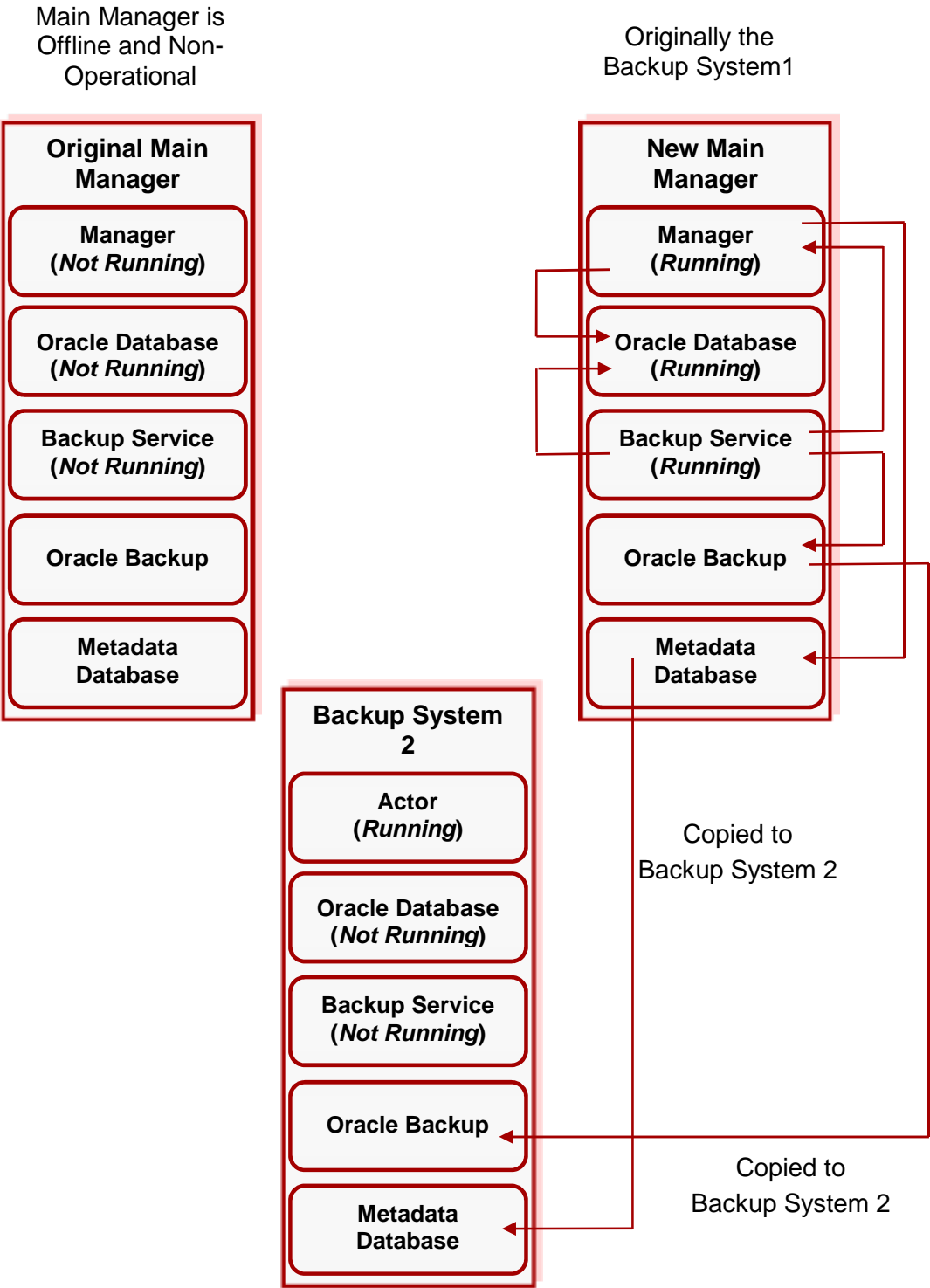
The following procedure is used to recover the DIVArchive System in the event of a failure. The first diagram is a typical DIVArchive System configuration showing the connections between the different modules; the second displays a failover case, and the third depicts a recovered, operational system. The Main Manager and Backup System 1 are configured identically but the Backup Service, Manager, and Oracle Database are not running until started (*see the third diagram*). The Backup Service creates the backups on the Main Manager Machine and then pushes copies of them to the Backup System 1, Backup System 2, and Backup System x (*if applicable*).

Figure 23: Typical DIVArchive System Configuration



For this example, assume the Main Manager Machine crashed and is offline. The procedure outlined below is the easiest and fastest way to get the system back online. Effectively switching the Original Backup Manager to be the New Main Manager and the Original Main Manager will be the New Backup Manager (*swapping places*) will result in the least amount of system down-time.

Figure 24: Main Manager Offline



Restore the Oracle Database on the New Main Manager from the latest Oracle Database backup. Execute the `restore.bat` script located in the `DIVA_HOME\Program\DBBackup\rman\bin` folder.

Syntax: `restore <defdir> <sid> <srcdir> [-syspwd=<syspwd>] [-nocomp]`

Table 10: restore.bat Command Definitions

Command	Definition
<code>sid</code>	Database Instance ID.
<code>defdir</code>	The default directory where the backup files are normally stored on local server.
<code>srcdir</code>	The directory containing the backup files to use as a source for restore. These files may be backup files coming from another server, or you can use the same directory as <code><defdir></code> if you want to restore from the local backup. When the two directories are different, the contents of <code><defdir></code> will be erased and replaced by a copy of the files from <code><srcdir></code> , and then the restore will take place.
<code>syspwd</code>	The database system user's password. When not specified, <code><sid></code> will be used instead. Note: Current RMAN versions seem to ignore this value.
<code>-nocomp</code>	Do not recompress backup files after restore.

Examples:

- **Local restore:**

```
restore "H:\oraback\lib5" LIB5 "H:\oraback\lib5"
```

- **Failover from Manager1 to Manager2, the command is executed on Manager2:**

```
restore "H:\oraback\lib5" LIB5 "H:\oraback\mgr1\lib5"
```

Caution: Do not forget the double-quotes around the paths.

On the New Main Manager, adjust the Manager Configuration File and Backup Service Configuration File to point to the Oracle Database that has just been restored (*Step 1 above*)

Update the parameters `DB_BACKUP_REMOTE_DESTINATIONS` and `FBM_BACKUP_REMOTE_DESTINATIONS` in the Backup Service Configuration File adding the Backup System 2 as a Remote Backup System on New Main Manager System.

```
DB_BACKUP_REMOTE_DESTINATIONS=rsync://Backup_System_x_IP_Address/ModuleName/OracleBackupFolderName
```

```
FBM_BACKUP_REMOTE_DESTINATIONS=rsync://Backup_System_x_IP_Address/ModuleName/MetaFolderName
```

Note: Be sure to repeat this step for all *Backup System x* machines.

Update the Metadata Database Location to the location where the Metadata Database Files were backed up on New Main Manager System (*Original Backup System 1*). This must be performed under the Manager Panel in the Control GUI on the New Main Manager Machine.

Run the Backup Service `reconcile` command on New Main Manager System.

```
dbbackup reconcile
```

This command will list all of the Complex Objects that are missing the Metadata File in the Metadata Database.

If a Complex Object is missing the Metadata File, it must be restored from the Original Main Manager or Backup System 2. Without the Metadata File, the Complex Object is no longer usable.

Start the Manager and Backup Service on the New Main Manager. Refer to Figure 10 for more details.

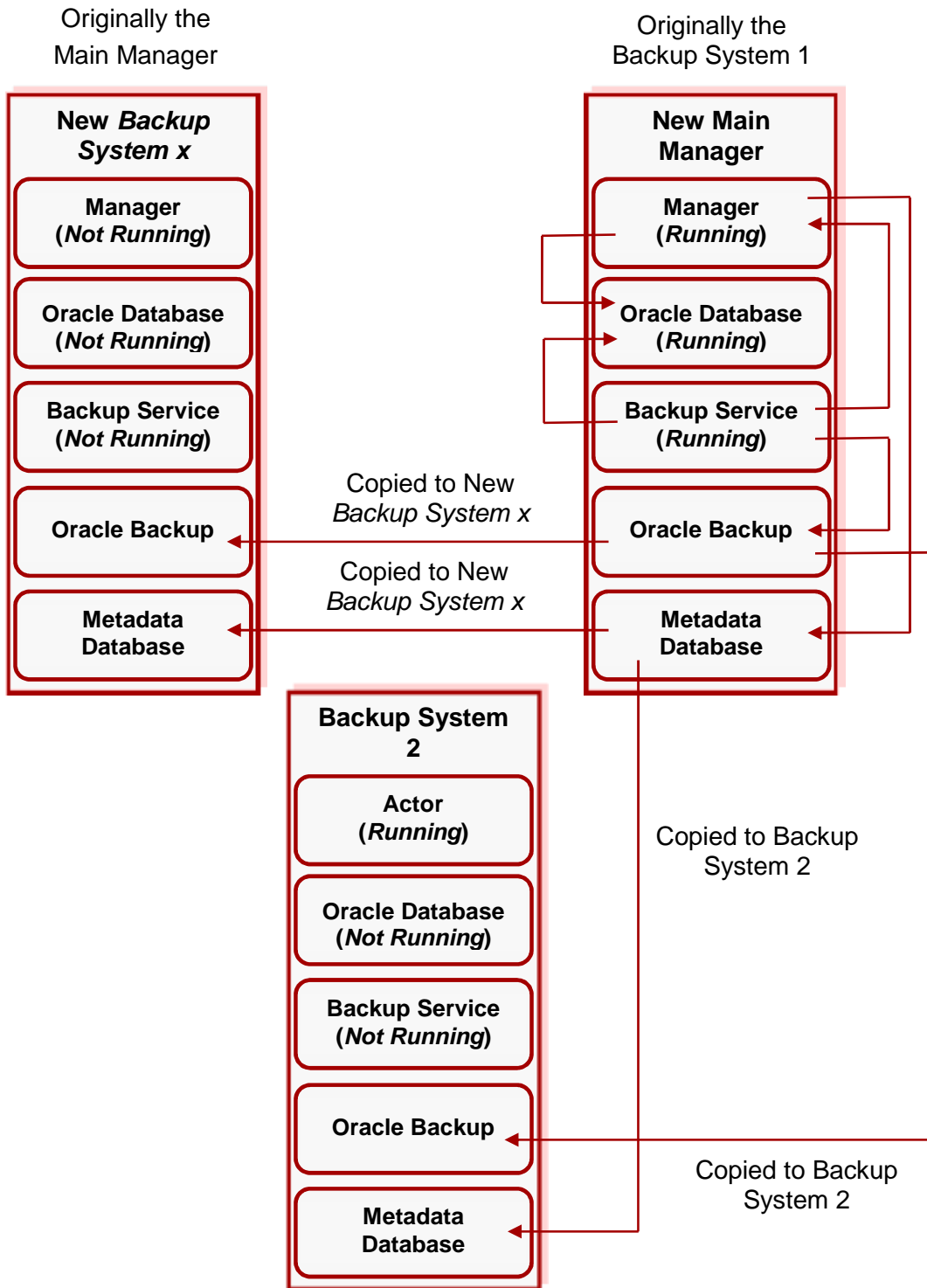
Once the Old Main Manager System is restored and recovered from its crash and is up and running, it will be converted to the New *Backup System x* with no down time. Refer to Figure 11 for more details.

Update the `DB_BACKUP_REMOTE_DESTINATIONS` and `FBM_BACKUP_REMOTE_DESTINATIONS` parameters in the Backup Service Configuration File on New Main Manager System by adding the New *Backup System x* (*Original Main Manager*) as the additional Remote Backup Location. **Note: Be sure to repeat this step for all *Backup System x* machines.**

Restart the Backup Service on the New Main Manager for changes to take effect.

Copy the existing Oracle Backups and Metadata Files from the *Backup System 2* (or *New Main Manager*) to the New *Backup System x* in the background.

Figure 25: System Configuration after Failover Recovery Procedure



6 Troubleshooting

6.1 Metadata Backup Failure Scenarios

The following tables describe:

- Typical DIVArchive Configuration.
- Different possible failure scenarios with resolutions.

Table 11: Typical DIVArchive Backup Configuration

Backup Type	Frequency
Metadata Database Network Transfer to Remote Backup Systems	Every 15 Minutes
Number of Remote Backup Systems	2

Table 12: Failure Scenarios, Causes and Resolutions

Scenario	Detection Method	Cause	Description	Recovery
Metadata Database Storage Disk Failure	<p>Complex Object Request fails with error:</p> <p>Internal error: metadata database error.</p> <p>Metadata Database Backup Failure notification is shown on the Control GUI and the Backup Failure Events are logged in the Manager Events.</p>	<ol style="list-style-type: none"> 1) RAID controller failure. 2) Power Surge. 3) External Process Error. 4) Volume reconstruction error if RAID was previously rebuilt. 	<p>Even though we recommend storing the Metadata Database on a RAID Disk, Disk Failure Scenarios cannot be totally eradicated, and the unlikely chance of Disk Failure still exist.</p> <p>Disk Failure on Main Manager:</p> <p>No more Complex Objects can be archived in to DIVArchive System. Only delete requests are possible on existing Complex Objects. DIVArchive is operational to archive Non Complex Objects.</p> <p>New Metadata Files created for Complex Objects archived since the last successful backup, up until the disk crash are not available immediately, but can be recovered from the AXF file.</p> <p>Disk Failure on one of the Backup Systems:</p> <p>Metadata Database files created by a new archive request since the Disk Failure are backed up only to one Backup System.</p>	<p>Disk Failure on Main Manager:</p> <p>Stop Manager and the Backup Service.</p> <p>Replace the failed disk.</p> <p>Go to the Manager Setting Tab in the Configuration Utility and make sure the Metadata Database Location is pointing to the replaced disk.</p> <p>Start Manager and the Backup Service.</p> <p>Copy all the Metadata Files from a Backup System to the Metadata Database Location on the replaced disk.</p> <p>Use the Backup Service reconcile command to confirm no Complex Objects are lost.</p> <p>Metadata Files of Complex Objects archived since the last successful backup and before the disk crash are not immediately available but they are recoverable from the AXF file.</p> <p>Recovery from AXF files is not supported in DIVArchive version 7.4; please contact Oracle Support.</p>

Scenario	Detection Method	Cause	Description	Recovery
Metadata Database Storage Disk Failure <i>(continued)</i>				Disk Failure on one of the Backup Systems: <p>The system can be operational if the backups made to the other Backup System were successful.</p> <p>Replace failed disk.</p> <p>Copy all Metadata Files from the second Backup System/Main Manager System to the Metadata Database location on the replaced disk.</p>

Scenario	Detection Method	Cause	Description	Recovery
Metadata Database File Corruption	<p>Complex Object Request fails with error:</p> <p>Internal error: metadata database error:</p> <p>Message: Metadata file read error.</p>	<p>External Process Error.</p> <p>File modified manually by mistake.</p>	<p>Metadata File modified by any external source other than DIVArchive after it is backed up won't affect its backup copies in the Backup Systems.</p> <p>Metadata File corruption will result in no operations/requests being possible except Delete Object on the Complex Object whose Metadata File is corrupted until it is restored.</p>	<p>If the corruption occurred after the metadata file is backed up, the metadata file can be restored from one of the backups servers.</p> <ol style="list-style-type: none"> 1) Use the tool <code>FindMetadataFile.bat</code> in the <code>DIVA_HOME/programs/utilities/bin</code> folder on the Main Manager System. 2) This tool prints out the location of the Metadata File with its filename inside the Metadata Location and takes the database connection parameters and Complex Object Name and Category as parameters. 3) Locate the file with the filename and path printed in step 2 in the Metadata Database Backup Location on one of the Backup Servers. 4) Replace the Metadata File on the Main Manager System Metadata Database Location with the copy from the Backup Server. 5) If the corruption occurred before the Metadata File was backed up, the Metadata File is not immediately available but it is recoverable from the AXF file. Recovery from AXF files is not supported in DIVArchive version 7.4; please contact Oracle Support.

Scenario	Detection Method	Cause	Description	Recovery
Metadata Database File lost or manually deleted.	<p>Complex Object Request fails with error:</p> <p>Internal error: metadata database error:</p> <p>Message: get: Error opening metadata for objectname/category , db error=Error file not found.</p>	<p>External Process Error.</p> <p>File deleted manually by mistake.</p>	<p>Metadata deleted by any external source other than DIVArchive after it is successfully backed up won't affect its backup copies on the Backup Systems.</p> <p>Metadata File corruption will result in no operations/request being possible except Delete Object on the Complex Object whose Metadata File is corrupted until is it restored.</p>	<p>If the file is lost after the Metadata File is backed up, the Metadata File can be restored from one of the Backup Servers.</p> <p>Use the tool <code>FindMetadataFile.bat</code> in the <code>DIVA_HOME/programs/utilities/bin</code> folder on the Main Manager System.</p> <p>This tool prints out the location of the Metadata File with its filename inside the Metadata Database Location taking the database connection parameters and Complex Object Name and Category as parameters.</p> <p>Locate the file with filename and path printed in step 2 in Metadata Database Backup Location on one of the Backup Servers.</p> <p>Replace the Metadata File on the Main Manager System Metadata Database Location with the copy from Backup Server.</p> <p>If the file is lost before the Metadata File was backed up, the Metadata File is not immediately available but can be recovered from the AXF file. Recovery from AXF files is not supported in DIVArchive version 7.4; please contact Oracle Support.</p>

Scenario	Detection Method	Cause	Description	Recovery
Metadata Database Backup to all Backup Systems failed.	Metadata Database Backup Failure Notification is shown on the Control GUI and the Backup Failure Events are logged in the Manager Events.	<ol style="list-style-type: none"> 1) Network Error. 2) Backup Systems offline. 3) RSYNC Daemon offline. 4) Backup Service crashed. 	<p>Failure to back up the Metadata Database to all Backup Systems means that all of the Complex Objects archived after this failure are not backed up. This failure must be resolved at the earliest possible time because the DIVArchive System is at risk of data loss.</p>	<p>Network Error: Resolve the network error.</p> <p>Backup System Offline: Start Backup systems.</p> <p>RSYNC offline: Restart RSYNC Daemon.</p> <p>Backup Service Crash: Restart the Backup Service and collect logs for investigation.</p> <p>Once the problem is resolved, all of the Backup Systems are synced automatically, backing up missing metadata files.</p> <p>There is no data recovery required for this scenario.</p>
Metadata Database Backup to one of the Backup Systems failed.	Metadata Database Backup Failure Notification is shown on the Control GUI and the Backup Failure Events are logged in the Manager Events.	<ol style="list-style-type: none"> 1) Network Error. 2) Backup System offline. 	<p>The Metadata Database is not backed up to one of the Backup Systems but is continued to be backed up to the other Backup System successfully.</p>	<p>Network Error: Resolve the network error.</p> <p>Backup System Offline: Start the Backup system.</p> <p>Once the problem is resolved the Backup Systems are synced automatically, backing up missing Metadata Files.</p> <p>There is no data recovery required for this scenario.</p>

6.2 *DIVArchive Manager will not start.*

Resolution: When Manager starts it will check the following parameters and if any combination of these parameters is incorrect, Manager will not start. Check the following parameters to make sure they are set correctly:

- Enable Metadata Database parameter.
- The Metadata Database Path must be a valid path and not empty.

6.3 *The DIVArchive Backup Service will not start.*

Resolution: If the DIVArchive Backup Service is configured incorrectly, it was designed to terminate the execution immediately after attempting to start. Such behavior can be caused by the following reasons:

- The configuration file is missing.
- The database connection information was incorrectly entered or the database is not running.
- The `BACKUP_SERVICE_MANAGE_METADATA_BACKUPS` parameter is set to **Y** (Yes/enabled) in the Configuration File but not enabled under the Manager Settings in the Configuration Utility.
- The `BACKUP_SERVICE_MANAGE_METADATA_BACKUPS` parameter is set to **Y** (Yes/enabled) in the Configuration File but the Metadata Database location is not set, or set to an invalid directory under the Manager Settings in the Configuration Utility.
- The `BACKUP_SERVICE_MANAGE_METADATA_BACKUPS` parameter is set to **Y** (Yes/enabled) in the Configuration File and the Metadata Database Backup is enabled under the Manager Settings in the Configuration Utility, but the Metadata Database location is not set, or set to an invalid directory.
- `BACKUP_SERVICE_MANAGE_DATABASE_BACKUPS` and `BACKUP_SERVICE_MANAGE_METADATA_BACKUPS` parameters are set to **N** (No/disabled) in the Configuration File. Refer to Section 0 for more details.
- `RMANRecoverWindow.bat` is not in the bin folder for the Backup Service.

7 Frequently Asked Questions

7.1 *How do I check the status of the DIVArchive Backup Service?*

Answer: Check the DIVArchive Backup Service status using the following command from the Windows Command Line interface:

```
dbbackup status
```

Refer to Table 5: dbbackup.bat Command Line Options and Table 0 for information on usage of the `status` command option.

7.2 *How do I Failover to a Backup System when my Main Manager System has crashed?*

Answer: Refer to Section 5.9.3 for complete procedure.

7.3 *How do I recover when the Metadata File of a Complex Object is corrupted in the Main Manager System?*

Answer: The DIVArchive Backup Service backs up the Metadata Database file by file. Once the file is backed up to the Backup Systems, any corruption to, or modifications of, the Metadata Files are not propagated to the Backup Systems.

If a Complex Object Metadata File is corrupted, restore the Metadata File from one of the Backup Systems.

In the unlikely event of disk corruption due to hardware failure occurring before the Backup Service has backed up the Metadata files, the non-backed up Metadata files can only be restored from a Tape/Disk. **The feature to restore Metadata Files from Tape/Disk is not available in DIVArchive 7.4 and will be available in future releases.**

7.4 *How do I recover when the Metadata File of a Complex Object is corrupted in the Backup Manager System?*

Answer: It is recommended to always make backup copies to two separate Backup Systems to handle these scenarios. Restore the Metadata File from the Secondary Backup or Main Manager System.

7.5 *When a Metadata File is manually deleted from Main Manager System, is it also deleted from all Backup Systems?*

Answer: No. Manually deleted Metadata Files are not propagated to the Backup Systems.

7.6 How do I recover when the Metadata File of a Complex Object is manually deleted in Main Manager System?

Answer: Execute the `dbbackup.bat reconcile` command to find out which Complex Object is missing the Metadata File. Restore the Metadata File from one of the Backup Systems.

7.7 How do I recover when the Metadata File of a Complex Object is lost on the Main System and all Backup Systems?

Answer: Metadata Files can be restored from Tape/Disk. **The feature to restore Metadata from Tape/Disk is not available in DIVArchive 7.4 and will be available in future releases.**

7.8 How do I recover when the Backup Disk crashes or gets corrupted on the Main Manager System?

Answer: Disk crashes or corruption requires a failover to the Backup Manager. Refer to Section 5.9.3 for more details.

7.9 How do I configure a Full Backup to start on a Backup Service start-up?

Answer: The DIVArchive Backup Service will automatically determine if a full backup is required on start. There is no configuration required.

7.10 How do I locate the Metadata of a Complex Object inside Metadata Database?

Answer: Please contact Oracle Support.

7.11 How does the Metadata Database maintain its Recovery Window when a Complex Object is deleted?

Answer: Refer to 5.9 for information.

7.12 How do I turn off Backup Service Notifications on the GUI?

Answer: Notification can be turned off by setting the `Database Backup Notification` parameter to `Disable` under the Manager Panel of Configuration Utility.

7.13 Can the DIVArchive Manager and Oracle Database be installed on separate servers?

Answer: No, the DIVArchive Backup Service doesn't support Manager and Oracle installations on separate servers in DIVArchive 7.4.

7.14 Does the Recovery Window apply to both Oracle Backups and Metadata Backups?

Answer: Yes.

7.15 How do I estimate the size for the Metadata Database location?

Answer: Refer to Section 5.2 for information on Metadata Database Sizing.

7.16 Where do I configure the Metadata Database location?

Answer: The Metadata Database location is configured by setting the value of the `Complex Objects Metadata Location` parameter in the Manager Setting Panel in Configuration Utility.

7.17 What information is stored in this metadata database (MDB)?

Answer: All the file details such as filenames, folder names, their location, size, checksum, etc.

7.18 Is this information irreplaceable/mission-critical?

Answer: It is always recommended to have at least 2 backup copies of the Metadata Database. Please use the DIVArchive Backup Service to back up the Metadata Database. In a worst case scenario, use the Oracle Archive eXchange Format (AXF) Explorer to recover the object from tape if the Metadata Database file of a particular object is lost.

7.19 Why is this information not being stored in the existing Oracle database?

Answer: The amount of Metadata information is huge as Complex Objects are now supported up to 1 million files. Currently, the Oracle Standard Edition One is in use, which does not have any scalability features to support Complex Object workflows.

7.20 What are the space requirements for this database/data? Do they depend on the quantity of objects, the complexity of those objects, or something else?

Answer: Refer to Section 5.2 for information on Metadata Database Sizing.

7.21 What becomes of a customer with, for example, 1M objects, each with 100K files?

Answer: Our Metadata Database is very scalable and should be able to handle this with no issues.

7.22 What are the consequences of this database being inoperable, corrupt, or missing; data loss, performance loss, or something else?

Answer: **Inoperable** – No Complex Object Requests could be processed.

Corrupt – Restore from one of the backup copies.

Missing - Restore from one of the backup copies.

7.23 What are the consequences of this database running out of available storage space; data loss, performance loss, or something else?

Answer: No Complex Object Requests could be processed.

7.24 What tools exist for testing/verifying the integrity of this database; are they automatic and/or can they be invoked manually?

Answer: Currently there are no tools that exist to check the integrity; please contact support if you need one.

7.25 What tools exist for backing up this database; are they automatic and/or can they be invoked manually?

Answer: Please always use the Backup Manager Service to back up the Metadata Database.

7.26 What tools exist for recovering this database in the event of loss/corruption, what is the procedure to execute recovery and is any of the recovery automatic?

Answer: Refer to

Failure Scenarios and Recovery Steps for recovery procedures.

7.27 Is the storage location of the “live” database performance-critical or space-critical?

Answer: Yes it is both space and performance critical. Refer to **DIVArchive Oracle Database Installation and Configuration** for installation and configuration instructions.

7.28 Can the location of the backups of this database be configured?

Answer: Yes it is both space and performance critical.

APPENDIX

A1 *DIVArchive Backup Service Windows Configuration File*

```
# -----
# DIVArchive Backup Service Configuration file
# -----
#
# Syntax:
#
# [SET |set ]property_name=property_value
# If the first word is "SET", it is ignored but the rest of the
# line is read.
# Every space is significant. Do not put extra spaces before or
# after property
# names or values.
#
# Lines beginning with "#" or that do not contain an equal sign are
# ignored.

#####
#####

# DIVArchive Backup Basic Settings
#####
#####

#####IMPORTANT#####
#####

# Please use DIVArchive database installation package for
# installing Oracle.

# Please use DIVArchive Prerequisites package for installing
# CYGWIN.

# Please use / instead of \ for directory location path values
# throughout this configuration file

#####
#####

# WINDOWS SPECIFIC OPTION
# DIVArchive Backup service name
# This variable can be used to specify the name of the windows
# service.
# If this variable is used, the service name will be "DIVArchive
# Backup - <SERVICE_NAME>".
```

Default: If this variable is not used, the service name will be "DIVArchive Backup".

Default port is 9300.

#SERVICE_NAME=

DIVArchive Backup service port

This will be the port number on which Backup service will be listening.

Default port is 9300.

SERVICE_PORT=9300

#####

MANAGER: Parameters for DIVArchive Manager

#####

The ip address and port of DIVArchive Manager

Address default is "localhost". Port valid range is 1..65535.
Default is 9000.

DIVAMANAGER_HOST=localhost

DIVAMANAGER_PORT=9000

#####

Connection parameters for the database - Use same Database and user DIVArchive Manager is connected

#####

NB! For the following "Database" parameters no defaults will be assumed!

DIVAMANAGER_DBHOST=localhost

DIVAMANAGER_DBPORT=1521

DIVAMANAGER_DBUSER=diva


```

#Database Instance identifiers DIVAMANAGER_DBSERVICENAME &
DIVAMANAGER_DBSID must be set.

DIVAMANAGER_DBSERVICENAME=lib5.world
DIVAMANAGER_DBSID=lib5

#####
#####

# BACKUP SERVICES

#####
#####

#This parameter is used enable/disable Oracle database backups to
be managed by Backup Service. If set to 'N' Backup Service
# won't backup Oracle database. Default is 'Y'.
BACKUP_SERVICE_MANAGE_DATABASE_BACKUPS=Y

# This parameter is used enable/disable Metadata database backups
to be managed by Backup Service. If set to 'N' Backup Service
# won't backup Metadata database. Default is 'N'.
#
# If this parameter is set to 'Y' and metedata database path is not
configured or invalid and Metadata database is not enabled under
# Manager setting panle on Control GUI, Backup Service will fail to
start.
BACKUP_SERVICE_MANAGE_METADATA_BACKUPS=N

#####
#####

# Backup Scripts & Cygwin location
# Please use / instead of \ for directory location path values
#####
#####

# Database Backup Script Location, The scripts are normally
installed at <DIVArchive_HOME>/programs/DBBackup/rman/bin during
# DIVArchive Installtion. Default is ../rman/bin
# If relative path is used, the start point must be from
<DIVArchive_HOME>/programs/DBBackup/bin.
SCRIPT_FILES_DIRECTORY=../rman/bin

```

```

#cygwin installation location, Default is C:/cygwin/bin
#Please use DIVArchive Prerequisites package for installing CYGWIN.
CYGWIN_BIN_DIRECTORY=C:/cygwin/bin

#####
#####

# Database Backup Configuration
# Please use / instead of \ for directory location path values
#####
#####

# Database backup Local destination. Default is H:/oraback/lib5
DB_BACKUP_LOCATION=H:/oraback/lib5

##### RSYNC SERVICE INSTALLATION & MODULE CONFIGURATION
#####

# Prerequisite - Please read Fully
#-----

#      1) Main Manager & all Remote backup systems must install
CYGWIN,RSYNC Service and RSYNC module configured.
#

#      2) DIVArchive Backup service uses the RSYNC module in CYGWIN,
so CYGWIN installation is mandatory before installation RSYNC
service.

#      3) Please use DIVArchive Prerequisites package, DIVArchive
Prerequisites package takes care of installing CYGWIN and RSYNC
service

#           follow steps 2 to 4 on "RSYNC Service Installation &
Module Configuration" below to add a new RSYNC module.
#

#      4) If DIVArchive Prerequisites package is not used, Please
Install CYGWIN and make sure RSYNC package is is also installed
during CYGWIN

#      Installation and follow steps 1 to 4 on "RSYNC Service
Installation & Module Configuration" below.

# RSYNC Service Installation & Module Configuration
# -----

# This configuration is mandatory for all Main Manager & Remote
backup systems.

```

```

#
# 1) Run the following command to install RSYNC service if it is
# not already installed.
#
# <CYGWIN_HOME>\bin\cygrunsrv -I rsyncd -d "RSYNC Daemon"
# --path /usr/bin/rsync --args '--config=/etc/rsyncd.conf --no-detach
# --daemon --quiet' -e CYGWIN='binmode tty nontsec'
#
# 2) Open <CYGWIN_HOME>\etc\rsyncd.conf
#
# 3) To add a new module add the following to rsyncd.conf
#
# [Module Name]
#
# path = <cygwin style path>
#
# comment = <Description>
#
# Example:
#
# [ORACLE_BACKUP]
#
# path = /cygdrive/h/oraback
#
# comment = Oracle backups
#
# 4) Start RSYNC service from Windows service manager or execute
# <CYGWIN_HOME>\bin\cygrunsrv -S rsyncd
#####
#####
##

# Database remote backup destination, no defaults will be assumed.
#
# All remote destination must be rsync service module name followed
# by Folder name. Backups must not be copied to RSYNC module root.
# Multiple destinations can be used, delimited by comma. Default is
# rsync://manager2/oraback/mgr1,rsync://actor3/oraback/mgr1
#
# Syntax : rsync://<Backup System ipaddress or
# hostname>/RSYNC_modulename/Folder Name
#
#Example : rsync://172.16.3.203/ORACLE_BACKUP/Jan_2011/
#Example :
# rsync://172.16.3.203/ORACLE_BACKUP/Jan_2011/,rsync://172.16.3.204/O
# RACLE_BACKUP/Jan_2011/

DB_BACKUP_REMOTE_DESTINATIONS=rsync://manager2/oraback/mgr1,rsync://
/actor3/oraback/mgr1

```

```

##### FULL DATABASE BACKUP SETTINGS
#####

# Start up time for full database backup.

# FULL_BACKUP_START_HOUR_24 = Hour to start full database backup,
valid range is 0 TO 23 , default value is 0 for midnight.

# FULL_BACKUP_START_MINUTE = Minute to start full database backup,
Valid range is 0 TO 59, default value is 0.

# FULL_BACKUP_FREQUENCY_HOURS = Frequency to run full database
backup in hours, default is 24 hours.


#Example:


# To set full backup frequency to every 6 hours.
# FULL_BACKUP_FREQUENCY_HOURS=6


# To set full backup frequency to every 1 day and 5 hours.
# FULL_BACKUP_FREQUENCY_HOURS=29


#####
#####

FULL_BACKUP_START_HOUR_24=0
FULL_BACKUP_START_MINUTE=0
FULL_BACKUP_FREQUENCY_HOURS=24


##### DB INCREMENTAL BACKUP SETTINGS
#####

# Incremental database backups have no startup time and are started
as soon as backup service starts.

# INCREMENTAL_FREQUENCY_MINUTES = Frequency to run incremental
database backups in minutes, default is 15 minutes.


#Example:

#To set incremental backup frequency to every 15 minutes.
#INCREMENTAL_FREQUENCY_MINUTES=15

#####
#####

INCREMENTAL_FREQUENCY_MINUTES=15

```

```

##### File Based Metadata Backup
Configuration #####
# FBM_BACKUP_REMOTE_DESTINATIONS: FBM remote backup destination.
All remote destination must be rsync service module name

#                                     followed by Folder
name. Backups must not be copied to RSYNC module root.

#                                     Multiple destinations
can be used, delimited by comma.

#                                     Default is
rsync://manager2/oraback/fbm,rsync://actor3/oraback/fbm.

#                                     Syntax :
rsync://<Backup System ipaddress or
hostname>/RSYNC_modulename/Folder Name

#

# FBM_FREQUENCY_MINUTES = Frequency to run FBM backup in minutes,
default is 15.

#

# Example:

# To set FBM backup frequency to every 15 minutes.
# FBM_FREQUENCY_MINUTES=15

#

# To set FBM backup frequency to every 3 hours and 15 minutes.
# FBM_FREQUENCY_MINUTES=195

#

# Notes: Metadata database Must be enabled and Metadata database
location must be configured from Configuration Utility.

#####
#####

FBM_BACKUP_REMOTE_DESTINATIONS=rsync://manager2/oraback/fbm,rsync:/
/actor3/oraback/fbm

FBM_FREQUENCY_MINUTES=15

##### Recovery WINDOW & CLEANUP OBSOLETE
BACKUP CONFIGURATION #####

#

#

# DB_FBM_RECOVERY_WINDOW_DAYS = Database and FBM recovery Window.
This parameter defined how days of oracle & FBM backup must be
retained.

```

```

#                                     Value must be > 0,
Default is 10.

#

# Start up time for backup cleanup.

# CLEANUP_START_HOUR_24 = Hour to start backup cleanup, valid range
is 0 TO 23 , default value is 2 in the morning.

# CLEANUP_START_MINUTE = Minute to start backup cleanup, Valid
range is 0 TO 59, default value is 0.

#

# Cleanup Frequency configures how frequently we want backup
manager to check for old backups taken beyond the recovery window
and delete them.

# CLEANUP_FREQUENCY_HOURS = Frequency to run backup cleanup,
default is 24.

#Example:

#

# To set backup cleanup frequency to every 6 hours.
# CLEANUP_FREQUENCY_HOURS=6

#

# To set full cleanup frequency to every 1 day and 5 hours.
# CLEANUP_FREQUENCY_HOURS=29

#####
#####

DB_FBM_RECOVERY_WINDOW_DAYS = 10

CLEANUP_START_HOUR_24=2
CLEANUP_START_MINUTE=00

CLEANUP_FREQUENCY_HOURS=24

##### SERVER DISK STORAGE
MONITORING #####

# MONITORED_DRIVES = User can mention windows partition drives they
want Backup service to monitor. Default is C: & H:

# DISK_MIN_SPACE_THRESHOLD_PERCENT = Notification Threshold
Percentage of available space of each drive accessible by server

# DEFAULT VALUE IS 5 PERCENT

```

```

# If available space on media is is reached warning notifications
will be sent out.  If available space is 20 percent below the
threshold

# an Error message will be sent out.

#####
#####

MONITORED_DRIVES=C:,H:

DISK_MIN_SPACE_THRESHOLD_PERCENT=5

#*****
**

# DIVArchive Backup Service Logging

#*****
**


# Levels can be:  DEBUG, INFO, WARN, ERROR, FATAL
# The default value is INFO.
LOGGING_ROOT_LEVEL=INFO
LOGGING_TRACE_LEVEL=INFO
LOGGING_SERVICE_LEVEL=INFO


# File size should be specified using the convention:  #KB|MB
# The default value is 10MB.
LOGGING_MAXFILESIZE=10MB


# All files (trace, service and .zip) older than this will be
removed
# hours
# The default value is 50.
LOGGING_LIFETIME=50

#####
#####

# DIVArchive Backup Service Options
#

# The following service parameters should not be changed without
# the consent of FPD Support.

#####
#####


# Level can be:  DEBUG, INFO, STATUS, ERROR, NONE
# To include thread dumps, set to DEBUG or INFO(default)

```

```

wrapper.logfile.loglevel=INFO

# The maximum size to allow Wrapper log files to reach before
# rolling. File size should be specified using the convention:
#k|m
wrapper.logfile.maxsize=1m

# Mode in which the service is installed. AUTO_START starts the
# service automatically when the system is rebooted. DEMAND_START
# which requires that the service be started manually.
wrapper.ntservice.starttype=AUTO_START

# Time without CPU before JVM will issue warning and extend timeout
# (in sec). Timeout will be extended by a few seconds at least
once
# before the service shuts down.
#wrapper.cpu.timeout=30

# Number of seconds to allow between the time that the Wrapper
# launches the JVM process and the time that the JVM side of the
# Wrapper responds that the application has started.
wrapper.startup.timeout=60

# Number of seconds to allow between the wrapper pinging the JVM
# and the response
wrapper.ping.timeout=60

# Number of seconds to allow between the time that the Wrapper asks
# the JVM to shutdown and the time that the JVM side of the Wrapper
# responds that it is stopping.
wrapper.shutdown.timeout=60

# Java Library Path (Add location of OCI driver ex: ocijdbc11.dll
if using DIVAMANAGER_TNSNAME.
# Ex: wrapper.java.library.path=.;C:\app\oracle\product\11.1.0)
wrapper.java.library.path=.

```



```

# License Key for Java Service Wrapper
#encoding=UTF-8
wrapper.license.type=DEV
wrapper.license.id=201603080000006
wrapper.license.licensee=Oracle America, Inc.
wrapper.license.group=Oracle DIVArchive
wrapper.license.dev_application=DIVArchive Database Backup Service
wrapper.license.features=pro, 64bit
wrapper.license.upgrade_term.begin_date=2013-01-18
wrapper.license.upgrade_term.end_date=2017-01-18
wrapper.license.key.1=64c2-004c-65c3-d82c
wrapper.license.key.2=b684-4d62-fd87-c7b3
wrapper.license.key.3=6029-7fef-53c4-535b
wrapper.license.key.4=0117-6de0-03b2-4d0f

#####
CRITICAL INFORMATION
#####

# PLEASE DO NOT MODIFY ANY OF THE BELOW PARAMETERS.

#####
#####
#####

FULL_BACKUP_COMMAND=%SCRIPT_FILES_DIRECTORY%full_backup
%DIVAMANAGER_DBSID% %DB_BACKUP_LOCATION% -
syspwd=%DIVAMANAGER_DB_SYS_PASSWORD%@%DIVAMANAGER_DBHOST%:%DIVAMANA
GER_DBPORT%/ %DIVAMANAGER_DBSERVICENAME%

INCREMENTAL_COMMAND=%SCRIPT_FILES_DIRECTORY%arch_backup
%DIVAMANAGER_DBSID% %DB_BACKUP_LOCATION% -
syspwd=%DIVAMANAGER_DB_SYS_PASSWORD%@%DIVAMANAGER_DBHOST%:%DIVAMANA
GER_DBPORT%/ %DIVAMANAGER_DBSERVICENAME%,rsync --delete -av --
include *.gz --include *.md5 --exclude=*.gz* --exclude=*.md5* --
exclude=*.BCK --exclude FAILED %DB_BACKUP_LOCATION%
%DB_BACKUP_REMOTE_DESTINATIONS%

CLEANUP_COMMAND=%SCRIPT_FILES_DIRECTORY%delete_backup_obsolete
%DIVAMANAGER_DBSID% %DB_BACKUP_LOCATION% -
syspwd=%DIVAMANAGER_DB_SYS_PASSWORD%@%DIVAMANAGER_DBHOST%:%DIVAMANA
GER_DBPORT%/ %DIVAMANAGER_DBSERVICENAME% -
keep=%DB_FBM_RECOVERY_WINDOW_DAYS%

#####
#####
#####

```

A2 *DIVArchive Backup Service Linux Configuration File*

```
# -----
# DIVArchive Backup Service Configuration file
# -----
#
# Syntax:
#
# [SET |set ]property_name=property_value
# If the first word is "SET", it is ignored but the rest of the line is
# read.
# Every space is significant. Do not put extra spaces before or after
# property
# names or values.
#
# Lines beginning with "#" or that do not contain an equal sign are
# ignored.

#####
#####

# DIVArchive Backup Basic Settings
#####
#####

#####IMPORTANT#####
#####

# Please use DIVArchive database installation package for installing
# Oracle.

#####
#####

# DIVArchive Backup service name
# This variable can be used to specify the name of the service.
# If this variable is used, the service name will be "DIVArchive Backup
# - this variable".
# Default: If this variable is not used, the service name will be
# "DIVArchive Backup".
#SERVICE_NAME=

# DIVArchive Backup service port
# This will be the port number on which Backup service will be listening.
# Default port is 9300.
```

SERVICE_PORT=9300

#####

MANAGER: Parameters for DIVArchive Manager

#####

The ip address and port of DIVArchive Manager

Address default is "localhost". Port valid range is 1..65535. Default
is 9000.

DIVAMANAGER_HOST=localhost

DIVAMANAGER_PORT=9000

#####

Connection parameters for the database - Use same Database and user
DIVArchive Manager is connected

#####

NB! For the following "Database" parameters no defaults will be
assumed!

DIVAMANAGER_DBHOST=localhost

DIVAMANAGER_DBPORT=1521

DIVAMANAGER_DBUSER=diva

#Database Instance identifiers DIVAMANAGER_DBSERVICENAME &
DIVAMANAGER_DBSID must be set.

DIVAMANAGER_DBSERVICENAME=lib5.world

DIVAMANAGER_DBSID=lib5

#####

BACKUP SERVICES

#####

#This parameter is used enable/disable Oracle database backups to be managed by Backup Service. If set to 'N' Backup Service
won't backup Oracle database. Default is 'Y'.

BACKUP_SERVICE_MANAGE_DATABASE_BACKUPS=Y

This parameter is used enable/disable Metadata database backups to be managed by Backup Service. If set to 'N' Backup Service

won't backup Metadata database. Default is 'N'.

#

If this parameter is set to 'Y' and metedata database path is not configured or invalid and Metadata database is not enabled under

Manager setting panle on Control GUI, Backup Service will fail to start.

BACKUP_SERVICE_MANAGE_METADATA_BACKUPS=N

#####

Backup Scripts & Cygwin location

Please use / instead of \ for directory location path values

#####

Database Backup Script Location, The scripts are normally installed at <DIVArchive_HOME>/programs/DBBackup/rman/bin during

DIVArchive Installtion. Default is ../rman/bin

If relative path is used, the start point must be from <DIVArchive_HOME>/programs/DBBackup/bin.

SCRIPT_FILES_DIRECTORY=../rman/bin

#####

Database Backup Configuration

#####

Database backup Local destination. Default is /u04/oraback/lib5

DB_BACKUP_LOCATION=/u04/oraback/lib5

```

##### RSYNC SERVICE INSTALLATION & MODULE CONFIGURATION
#####

# Prerequisite - Please read Fully
#-----

# 1) Main Manager & all Remote backup systems must RSYNC Service and
RSYNC module configured.
#
# 2) DIVArchive Backup service uses the RSYNC service.
#
# 3) Please use DIVArchive Prerequisites package, DIVArchive
Prerequisites package takes care of installing CYGWIN and RSYNC service
# follow steps 2 to 4 on "RSYNC Service Installation & Module
Configuration" below to add a new RSYNC module.
#
# 4) If DIVArchive Prerequisites package is not used, Please Install
CYGWIN and make sure RSYNC package is also installed during CYGWIN
# Installation and follow steps 1 to 4 on "RSYNC Service Installation
& Module Configuration" below.

# RSYNC Service Module Configuration
# -----

# This configuration is mandatory for all Main Manager & Remote backup
systems.
#
# 2) Open /etc/rsyncd.conf
# 3) To add a new module add the following to rsyncd.conf
#
#         [Module Name]
#
#             path = <cygwin style path>
#             comment = <Description>
#
# Example:
#
#         [ORACLE_BACKUP]
#
#             path = /u04/oraback
#             comment = Oracle backups
# 4) Start RSYNC service from Windows service manager or execute
<CYGWIN_HOME>\bin\cygrunsrv -S rsyncd
#####
#####

# Database remote backup destination, no defaults will be assumed.
#

```

```
# All remote destination must be rsync service module name followed by
Folder name. Backups must not be copied to RSYNC module root.

# Multiple destinations can be used, delimited by comma. Default is
rsync://manager2/oraback/mgr1,rsync://actor3/oraback/mgr1

#

# Syntax : rsync://<Backup System ipaddress or
hostname>/RSYNC_modulename/Folder Name

#

#Example : rsync://172.16.3.203/ORACLE_BACKUP/Jan_2011/

#Example :
rsync://172.16.3.203/ORACLE_BACKUP/Jan_2011/,rsync://172.16.3.204/ORAC
LE_BACKUP/Jan_2011/
```

```
DB_BACKUP_REMOTE_DESTINATIONS=rsync://manager2/oraback/mgr1,rsync://ac
tor3/oraback/mgr1
```

```
##### FULL DATABASE BACKUP SETTINGS
#####
```

```
# Start up time for full database backup.

# FULL_BACKUP_START_HOUR_24 = Hour to start full database backup, valid
range is 0 TO 23 , default value is 0 for midnight.

# FULL_BACKUP_START_MINUTE = Minute to start full database backup, Valid
range is 0 TO 59, default value is 0.

# FULL_BACKUP_FREQUENCY_HOURS = Frequency to run full database backup
in hours, default is 24 hours.
```

```
#Example:
```

```
# To set full backup frequency to every 6 hours.
```

```
# FULL_BACKUP_FREQUENCY_HOURS=6
```

```
# To set full backup frequency to every 1 day and 5 hours.
```

```
# FULL_BACKUP_FREQUENCY_HOURS=29
```

```
#####
```

```
FULL_BACKUP_START_HOUR_24=0
```

```
FULL_BACKUP_START_MINUTE=0
```

```
FULL_BACKUP_FREQUENCY_HOURS=24
```

```
##### DB INCREMENTAL BACKUP SETTINGS
#####
```

Incremental database backups have no startup time and are started as soon as backup service starts.

INCREMENTAL_FREQUENCY_MINUTES = Frequency to run incremental database backups in minutes, default is 15 minutes.

#Example:

#To set incremental backup frequency to every 15 minutes.

#INCREMENTAL_FREQUENCY_MINUTES=15

#####

INCREMENTAL_FREQUENCY_MINUTES=15

File Based Metadata Backup
Configuration #####

FBM_BACKUP_REMOTE_DESTINATIONS: FBM remote backup destination. All remote destination must be rsync service module name

followed by Folder name.
Backups must not be copied to RSYNC module root.

Multiple destinations can be used, delimited by comma.

Default is
rsync://manager2/oraback/fbm,rsync://actor3/oraback/fbm.

Syntax : rsync://<Backup
System ipaddress or hostname>/RSYNC_modulename/Folder Name

#

FBM_FREQUENCY_MINUTES = Frequency to run FBM backup in minutes, default is 15.

#

Example:

To set FBM backup frequency to every 15 minutes.

FBM_FREQUENCY_MINUTES=15

#

To set FBM backup frequency to every 3 hours and 15 minutes.

FBM_FREQUENCY_MINUTES=195

#

Notes: Metadata database Must be enabled and Metadata database location must be configured from Configuration Utility.

#####

```
FBM_BACKUP_REMOTE_DESTINATIONS=rsync://manager2/oraback/fbm,rsync://actor3/oraback/fbm
```

```
FBM_FREQUENCY_MINUTES=15
```

```
##### Recovery WINDOW & CLEANUP OBSOLETE  
BACKUP CONFIGURATION #####
```

```
#
```

```
#
```

```
# DB_FBM_RECOVERY_WINDOW_DAYS = Database and FBM recovery Window. This  
parameter defined how days of oracle & FBM backup must be retained.
```

```
# Value must be > 0, Default is  
10.
```

```
#
```

```
# Start up time for backup cleanup.
```

```
# CLEANUP_START_HOUR_24 = Hour to start backup cleanup, valid range is  
0 TO 23 , default value is 2 in the morning.
```

```
# CLEANUP_START_MINUTE = Minute to start backup cleanup, Valid range is  
0 TO 59, default value is 0.
```

```
#
```

```
# Cleanup Frequency configures how frequently we want backup manager to  
check for old backups taken beyond the recovery window and delete them.
```

```
# CLEANUP_FREQUENCY_HOURS = Frequency to run backup cleanup, default is  
24.
```

```
#Example:
```

```
#
```

```
# To set backup cleanup frequency to every 6 hours.
```

```
# CLEANUP_FREQUENCY_HOURS=6
```

```
#
```

```
# To set full cleanup frequency to every 1 day and 5 hours.
```

```
# CLEANUP_FREQUENCY_HOURS=29
```

```
#####  
#####
```

```
DB_FBM_RECOVERY_WINDOW_DAYS = 10
```

```
CLEANUP_START_HOUR_24=2
```

```
CLEANUP_START_MINUTE=00
```


CLEANUP_FREQUENCY_HOURS=24

SERVER DISK STORAGE
MONITORING #####

MONITORED_DRIVES = User can mention mounted drives they want Backup
service to monitor. Default is /u04 & /u05

DISK_MIN_SPACE_THRESHOLD_PERCENT = Notification Threshold Percentage
of available space of each drive accessible by server

DEFAULT VALUE IS 5 PERCENT

If available space on media is reached warning notifications will
be sent out. If available space is 20 percent below the threshold

an Error message will be sent out.

#####

MONITORED_DRIVES=/u04,/u05

DISK_MIN_SPACE_THRESHOLD_PERCENT=5

DIVArchive Backup Service Logging

Levels can be: DEBUG, INFO, WARN, ERROR, FATAL

The default value is INFO.

LOGGING_ROOT_LEVEL=INFO

LOGGING_TRACE_LEVEL=INFO

LOGGING_SERVICE_LEVEL=INFO

File size should be specified using the convention: #KB|MB

The default value is 10MB.

LOGGING_MAXFILESIZE=10MB

All files (trace, service and .zip) older than this will be removed

hours

The default value is 50.

LOGGING_LIFETIME=50

#####

DIVArchive Backup Service Options

#

```

# The following service parameters should not be changed without
# the consent of FPD Support.
#####

# Level can be:  DEBUG, INFO, STATUS, ERROR, NONE
# To include thread dumps, set to DEBUG or INFO(default)
wrapper.logfile.loglevel=INFO

# The maximum size to allow Wrapper log files to reach before
# rolling.  File size should be specified using the convention: #k|m
wrapper.logfile.maxsize=1m

# Mode in which the service is installed. AUTO_START starts the
# service automatically when the system is rebooted. DEMAND_START
# which requires that the service be started manually.
wrapper.ntservice.starttype=AUTO_START

# Time without CPU before JVM will issue warning and extend timeout
# (in sec).  Timeout will be extended by a few seconds at least once
# before the service shuts down.
#wrapper.cpu.timeout=30

# Number of seconds to allow between the time that the Wrapper
# launches the JVM process and the time that the JVM side of the
# Wrapper responds that the application has started.
wrapper.startup.timeout=60

# Number of seconds to allow between the wrapper pinging the JVM
# and the response
wrapper.ping.timeout=60

# Number of seconds to allow between the time that the Wrapper asks
# the JVM to shutdown and the time that the JVM side of the Wrapper
# responds that it is stopping.
wrapper.shutdown.timeout=60

```

```
# Java Library Path (Add location of OCI driver ex: ocijdbc11.dll if
using DIVAMANAGER_TNSNAME.

# Ex: wrapper.java.library.path=.)
wrapper.java.library.path=.

# License Key for Java Service Wrapper
#encoding=UTF-8
wrapper.license.type=DEV
wrapper.license.id=201603080000006
wrapper.license.licensee=Oracle America, Inc.
wrapper.license.group=Oracle DIVArchive
wrapper.license.dev_application=DIVArchive Database Backup Service
wrapper.license.features=pro, 64bit
wrapper.license.upgrade_term.begin_date=2013-01-18
wrapper.license.upgrade_term.end_date=2017-01-18
wrapper.license.key.1=64c2-004c-65c3-d82c
wrapper.license.key.2=b684-4d62-fd87-c7b3
wrapper.license.key.3=6029-7fef-53c4-535b
wrapper.license.key.4=0117-6de0-03b2-4d0f
```

```
#####
CRITICAL                                     INFORMATION
#####
```

```
# PLEASE DO NOT MODIFY ANY OF THE BELOW PARAMETERS.
```

```
#####
#####
#####
```

```
FULL_BACKUP_COMMAND=%SCRIPT_FILES_DIRECTORY%full_backup
%DIVAMANAGER_DBSID% %DB_BACKUP_LOCATION% -
syspwd=%DIVAMANAGER_DB_SYS_PASSWORD%@%DIVAMANAGER_DBHOST%:%DIVAMANAGER
_DBPORT%/%DIVAMANAGER_DBSERVICENAME%
```

```
INCREMENTAL_COMMAND=%SCRIPT_FILES_DIRECTORY%arch_backup
%DIVAMANAGER_DBSID% %DB_BACKUP_LOCATION% -
syspwd=%DIVAMANAGER_DB_SYS_PASSWORD%@%DIVAMANAGER_DBHOST%:%DIVAMANAGER
_DBPORT%/%DIVAMANAGER_DBSERVICENAME%,rsync --delete -av --include *.gz
--include *.md5 --exclude=*.gz* --exclude=*.md5* --exclude=*.BCK --
exclude FAILED %DB_BACKUP_LOCATION% %DB_BACKUP_REMOTE_DESTINATIONS%
```

```
CLEANUP_COMMAND=%SCRIPT_FILES_DIRECTORY%delete_backup_obsolete
%DIVAMANAGER_DBSID% %DB_BACKUP_LOCATION% -
syspwd=%DIVAMANAGER_DB_SYS_PASSWORD%@%DIVAMANAGER_DBHOST%:%DIVAMANAGER
```

```
_DBPORT%/%DIVAMANAGER_DBSERVICENAME% -
keep=%DB_FBM_RECOVERY_WINDOW_DAYS%

#####
#####
#####
```

A3 Backup Service Status Error and Warning Messages

Message Type	Code	User Message	Posted to Manager
SUCCESS	0	Completed successfully	Yes – Information
RUN	1	Running	No – Internal
ERROR	2	Failure: Refer to Backup Service logs for more details.	Yes – Error
TIMEOUT	3	Timeout: The process is taking longer to complete than the configured intervals.	Yes – Warning
STARTUP_FAILURE	4	DIVArchive Backup Service failed to start. Refer to the Backup Service logs for more details.	Yes – Error
INITIALIZE	5	Scheduling Backups	No – Internal
TIMEOUTERROR	6	Timeout: The process is taking longer to complete than the configured interval.	Yes - Error
CONFIGERROR	1000	Invalid Configuration Error. Refer to the Backup Service logs for more details.	Yes – Error
METADATALOCATIONERROR	6000	The Metadata Database Locations does not exist. Refer to the Backup Service logs for more details.	Yes – Error
CLEANUPFBMFILEERROR	7000	The Metadata Database file deletion failed. Refer to the Backup Service logs for more details.	Yes – Error
CLEANUPFBMFILEWARNING	7001	Failed deleting the Metadata Database.	Yes – Error
RSYNCEERROR	8000	An error occurred while copying backups to remote backup destinations. Refer to the Backup Service logs for more details.	Yes – Error

Message Type	Code	User Message	Posted to Manager
RSYNCIOERROR	8002	An I/O error occurred while copying backups to remote backup destinations. Refer to the Backup Service logs for more details.	Yes – Error
RSUNCTIMEOUTWARNING	8003	A timeout occurred while copying backups to remote backup destinations. Refer to the Backup Service logs for more details.	Yes - Warning
RSYNCTIMEOUTERROR	8005	A timeout occurred while copying backups to remote backup destinations. Refer to the Backup Service logs for more details.	Yes - Error
DBCONNECTERROR	9000	Database connection error. Refer to the Backup Service logs for more details.	Yes - Error
SQLERROR	9001	Database SQL error. Refer to the Backup Service logs for more details.	Yes - Error
DBROLLBACKERROR	9002	Database Rollback error. Refer to the Backup Service logs for more details.	Yes - Error