

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT'S OF HUMAN SERVICES, INSURANCE, AND AGING

INFORMATION TECHNOLOGY STANDARD

Name Of Standard: Database Backups	Number: STD-DMS006
Domain: Data	Category: Database Backups
Date Issued: 08/25/2009	Issued By Direction Of: 
Date Revised: 06/30/2016	Clifton Van Scyoc, Dir of Div. of Tech Engineering

Abstract:

The Department of Human Services (DHS) has a multi-platform architecture consisting of Unisys hierarchical and relational databases on the mainframe, Oracle and Microsoft SQL Server relational database management systems (RDMS) on Windows and Linux OS platforms.

The Data Integrity Unit (DIU) within the Database Management Section (DMS) is responsible for overseeing the reliable and efficient recovery of data due to loss and/or data corruption within the Department of Human Services (DHS) business applications. The unit also develops, implements, and continually refines efficient and effective measures for all DHS databases to safeguard information resources while maximizing availability of data throughout the Department.

The Data Integrity Unit coordinates and works closely with appropriate personnel in the Division of Infrastructure Management of Operations. Determining the type of backup methodology is based on application and business requirements and discussions held with the Data Integrity Unit, Application Owner and end users.

General:

This document contains DHS standards on the software, backup schedule, and types of backups used within the Bureau of Information Systems and supplements the standards contained in the Governor's Office of Administration/Office of Information Technology (OA/OIT) Information Technology Bulletins specifically,

[ITP-INF001](#) - Database Management Systems

Policy Supplements:

[STD-INF001A](#) - Database Product Standards

[OPD-INF001B](#) - Database Management Systems: Production and Operations Standards

Standard:

Mainframe

Software

The Integrated Recovery Utility (IRU) is the software used for backups on the Unisys 2200 Mainframe for the Unisys 2200 Database Management System and the Unisys 2200 Relational Database Management System.

Backup Schedule

Dynamic backups of all databases on the Production mainframe, Host HSH-A, are scheduled every night after the AP1SAV job except on Sunday when a static backup is completed first. The audit trail tapes are then swapped and all databases are dumped dynamically to Host HSH-C.

Dynamic backups of SAT, Systems Acceptance, occur 7 days each week at 01:00 hours

Static backups of all databases on the Host HSH-C, Development mainframe are as follows:

DEV, Development backups occur every Friday after COMPLT and every Sunday at 18:00 hours

TRN, Training backups occur Monday through Saturday at 20:00 hours

INT, Integration backups occur every Friday after 18:00 and every Saturday at 20:00 hours

Disaster Recovery

The backup tapes of Production on Host HSH-A are replicated at the Harrisburg Data Center as they are created.

Backup Types

Dynamic Backup

Database files are up and available for update and retrieval during backup process.

Static Backup

Database files are down and unavailable for update or retrieval during backup process.

Read Only

Database files are unavailable for updating but are available for retrieval during backup process.

Oracle

Software

Oracle Recovery Manager (RMAN)

Oracle Data Pump Export Utility and Oracle Data Pump Import Utility

Databases residing in an ORACLE relational database management system use ORACLE Recovery Manager (RMAN). The RMAN repository resides in a separate ORACLE instance/database within the ASM

Disk Manager. The 'resync catalog' command is executed twice per week, at a minimum, to keep the control file and the RMAN repository current. The RMAN repository is backed up daily. Depending on application requirements and the volatility of the application, a decision between the DBA, Application owner and Development Analyst will be made to run databases in ARCHIVELOG or NOARCHIVELOG mode. The backup strategy includes control files, online and archive redo log files, and data files.

Backup Schedule

Full Backups

Environment	Processing Type	Server Name	Oracle RMAN backups to Data Domain	Oracle Data Pump Export Utility	Type of Backup
			Frequency	Export Type /Frequency	
DEV	OLTP	HSORCDADM10, HSORCDADM11	Weekly – Sat Archive Logs – Daily every 3 hours 05:00 to 23:00	Full Daily	Hot
INT	OLTP	HSORCIADM12 HSORCIADM13	Weekly – Sat Archive Logs – Daily every 3 hours 05:00 to 23:00	Meta data only	Hot
TRN	OLTP	HSORCTADM28 HSORCTADM29	Weekly – Sat Archive Logs – Daily every 3 hours 05:30 to 23:30	Full Daily Meta data only EDXRADC	Hot
SAT	OLTP	HSORCSADM20 HSORCSADM21	Weekly Sat Archive Logs – Daily every 3 hours 05:00 to 23:00	Full Daily	Hot
TFP	OLTP	HSORCTADM28 HSORCTADM29	Weekly Saturday Archive Logs – Daily every 3 hours 05:00 to 23:00	Meta data Daily	Hot
LOAD	OLTP	HSORCSADM20 HSORCSADM21	Upon request	Upon request	Hot
PROD	OLTP	HSORCPADM30 HSORCPADM31 HSORCPADM32 HSORCPADM37 HSORCPADM38 HSORCPADM39	DB - Weekly Mon and Fri Archive Logs – Daily every 3 hours 06:00 to 23:00	Full export Daily	Hot
DEV	DW	HSORCWADM40 HSORCWADM41	Weekly Saturday Archive Logs – Daily every 3 hours 06:00 to 23:00	Meta data Daily	Hot
TRN	DW	HSORCWADM40 HSORCWADM41	Weekly Saturday Archive Logs – Daily every 3 hours 06:00 to 23:00	Meta data Daily	Hot

SAT	DW	HSORCWADM40 HSORCWADM41	Weekly Saturday Archive Logs – Daily every 3 hours 06:00 to 23:00	Meta data Daily	Hot
TFP	DW	HSORCWADM40 HSORCWADM41	Weekly Saturday Archive Logs – Daily every 3 hours 06:00 to 23:00	Meta data Daily	Hot
PROD	DW	HSORCWADM42 HSORCWADM43	Weekly Mon and Sat Archive Logs – Daily every 3 hours 06:00 to 23:00	Meta data Daily CWIS full daily	Hot

*OLTP – Online Transaction Processing

*DW – Data Warehouse also known as OLAP – Online Analytical Processing

*DEV – Development, INT – Integration, TRN – Training, SAT – Systems Acceptance Test, TFP – Test For Production, PROD - Production

The above schedule is followed on a regular basis except when problems occur at which times the schedule may fluctuate/change at the discretion of the DIU Chief or DMS Director.

The archive log files for all Databases are written to Data Domain located at Ashburn (ADC) and replicated to Data Domain located at Harrisburg (HDC) data center.

Backup and Restore Process for the Load Test Databases

A user of the load environment database can make a request to have a new baseline created or a roll back of the database to the original baseline. The backup and restore of the load environment database is done through an RMAN backup and the use of the Oracle flash recovery feature. To establish the ability to recover the load database environment, an RMAN backup is taken of the database, the backup is written to Data Domain, at the same time a restore point is established with the flash recovery. Upon request, a restore of the database can be done by restoring the backup or by flashing back to the restore point; this depends on the need of the user request.

Disaster Recovery

Ongoing during each day all backups and archive logs on Data Domain are replicated from Data Domain Ashburn Data Center (ADC) to Data Domain Harrisburg Data Center (HDC) for all database environments.

A hardware solution, recovery timeline and Databases to be restored are not yet defined and under discussion.

Backup Types

Hot Backup

During a hot backup the database has been started, is open and available to end users. The online redo logs are archived and used for database recovery if needed.

SQL Server

Software

DHS databases residing in a SQL Server environment use SQL Server native backup tools through SQL Server Management Studio storing in Data Domain.

The backup strategy includes full and transaction logs.

Backup Schedule

Full backups are scheduled once a day with the exception of the Documentum servers which run multiple days within a week.

PROD (Production) – Daily full at midnight

Documentum server databases full every M-W-F 8:00 PM

Biztalk – Daily full at 8:00 PM

TFP (Test for Production) – Daily full at midnight

Documentum server databases full every M-W-F 8:00 PM

Biztalk – Daily full at 9:00 PM

SAT (Systems Acceptance Test) – Daily full at midnight

Documentum server databases full every M-W-F 8:00 PM

Biztalk – Daily full at 9:00 PM

INT (Integration) -- Daily full at midnight

Documentum server databases full every M-W-F 8:00 PM

Biztalk – Daily full at 9:00 PM

DEV (Development) – Daily full at midnight

Documentum server databases full every M-W-F 8:00 PM

Biztalk – Daily full at 9:00 PM

LOAD (LOAD) – Daily full at midnight

Documentum server databases full every M-W-F 8:00 PM

Biztalk – Daily full at Midnight

TRN (Training) – Daily full at midnight

Biztalk – Daily full at Midnight

Transaction log backups are scheduled as follows:

PROD (Production) - Daily every 3 hours (6:00AM to 6:00 PM)

Documentum server PWDOCPRDSQL30 daily every 3 hours (7:00 AM to 4:00 PM)
HSDOCPRDSQL34CL daily every 2 hours (7:00 AM to 7:00 PM)

Biztalk – Daily every hour

TFP (Test for Production) – Daily at Noon except

BizTalk – Daily every 3 hours

SAT (Systems Acceptance Test) – Daily at Noon except

BizTalk – Daily every 3 hours

INT (Integration) – Daily at Noon except

BizTalk – Daily every 3 hours

DEV (Development) – Daily at Noon except

BizTalk – Daily every 3 hours

LOAD (LOAD) – Daily at Noon except

Biztalk – Daily every 16 hours

TRN (Training) – Daily at Noon except

BizTalk – Daily every 8 hours

Disaster Recovery

Ongoing during each day all backups and transaction logs on Data Domain are replicated from Data Domain Ashburn Data Center (ADC) to Data Domain Harrisburg Data Center (HDC) for all database environments.

A hardware solution, recovery timeline and Databases to be restored are not yet defined and under discussion.

Backup Types

Full Backup

During a full backup, the database is available to the end users. A full backup stores all data and objects, set of file groups or files that are currently part of a database. This includes the information stored in tables, as well as the object definitions, such as triggers, views, stored procedures and user permissions. It also includes enough of the transaction log file needed to recover the data. Each full backup is consistent up to the time of the end of the preceding full backup. Additionally, a full backup is the only type of backup that can be performed on the SQL Server master database. Full backups do not truncate the transaction log files at the completion of the backup operation.

Transaction Log Backup

Transaction log backups are a method in which information is backed up to restore the database to a point-in-time recovery. The transaction log backups run after a full backup has been run and will only backup data modifications that have modified the database since the last full backup or last transaction log backup. By default the transaction log is deleted after a transaction log backup has been performed. It should be noted that to return a database to a point-in-time using transaction log backups, you must have both a full backup and an unbroken sequence of transaction log backups.

Exemptions from this Standard:

There will be no exemptions to this standard.

Refresh Schedule:

All standards and referenced documentation identified in this standard will be subject to review and possible revision annually or upon request by the DHS Information Technology Standards and Policy Team.

Standard Revision Log:

Change Date	Version	Change Description	Author and Organization
08/25/2009	1.0	Initial Creation	Database Integrity, Patty Gillingham
06/30/2016	1.1	Update Standard	Stacey Borger, BIS-DMS