Oracle Secure Backup: Optimized for Oracle Environments

An Oracle White Paper
April 2006

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Optimized for Oracle Environments

Product Highlights

Centralized backup administration of heterogeneous environments

Oracle Database protection to tape

File system backup and restore

Backup over the LAN or SAN

Server authentication and secure inter-domain communication

Broad tape device support

Dynamic drive sharing

Policy based backup management

Data and Message encryption

User-level access control

Integrated with Oracle: Recovery Manager (RMAN) and Enterprise Manager (EM)

TAPE BACKUP PROTECTING THE WHOLE ORACLE ENVIROMENT

Pressures on the enterprise backup infrastructure have increased demanding more rigorous service level agreements for backup windows and restoration time while maintaining reliable data protection within budget. Tape technology has risen to meet the challenge offering high-speed devices and high capacity media with throughput similar to that of disk only handicapped by the high-cost of tape backup software, until now! Oracle Secure Backup 10.1 changes the tape backup landscape providing centralized tape backup management for the Oracle Database and file systems in mixed, diverse environments reducing the cost and complexity of tape backup and restoration.

ORACLE SECURE BACKUP

Ideal for Oracle customers, Oracle Secure Backup provides data protection for heterogeneous UNIX, Linux, Windows and Network Attached Storage (NAS) environments. With a highly scalable client / server architecture, Oracle Secure Backup delivers local and remote capabilities meeting basic or more advanced backup and restoration requirements for the entire Oracle environment:

- Oracle Database through integration with Recovery Manager (RMAN) supporting versions Oracle9*i* and above
- File system data protection of distributed servers including:
    - Configuration files of Oracle application products
    - Oracle Home and binaries

The combination of RMAN and Oracle Secure Backup provides an end-to-end tape backup solution eliminating the need for 3rd party tape backup software. Oracle customers will now have a single technical resource for addressing database backups from disk to tape for expedited problem resolution.

CENTRALIZED TAPE BACKUP MANAGEMENT

Client / Server architecture with three configurable host roles:

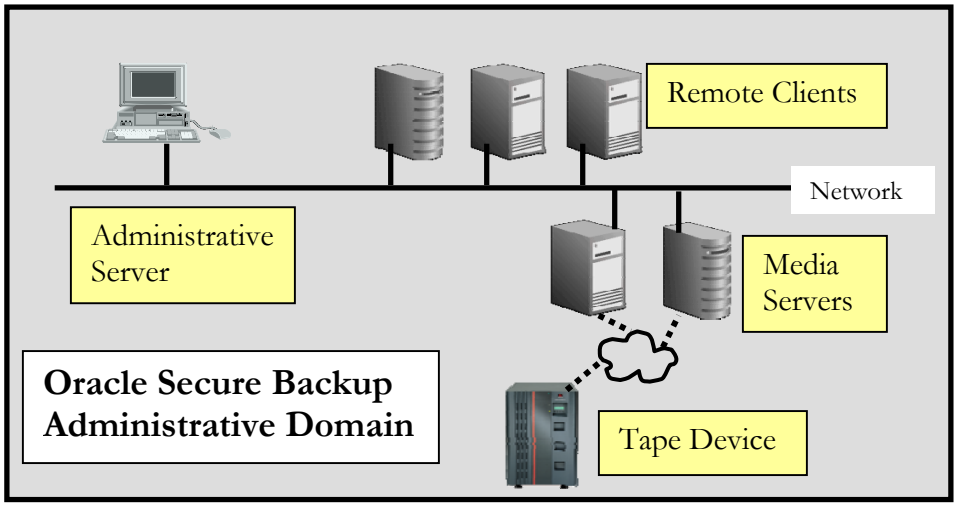
- **Administrate Server, one per environment, houses catalog, backup history, configuration settings and acts as Certification Authority within the domain.**
- **Media Server transfers data to and from attached tape devices.**
- **Client hosts are backed up to configured drives.**

Oracle Secure Backup offers centralized backup management of heterogeneous clients and servers through a single point of administration called the Oracle Secure Backup Administrative Server. The configured machines and devices managed by an Administrative Server comprise an Oracle Secure Backup Administrative Domain.

The administrative server may be a single-purpose server (as depicted in the graphic below) or share server resources with other applications. With a relatively small installed footprint, the Oracle Secure Backup processes and catalog are optimized keeping resource requirements to a minimum.

An administrative domain may be configured to leverage tape resources across local and remote servers based on user-defined access in dedicated or shared configurations. In shared tape environments, Oracle Secure Backup manages job contention allocating operations dynamically as resources become available keeping valuable tape drives spinning.

A simple administrative domain with utilizing shared tape storage in a SAN is pictured below:



When determining server role(s) and how tape devices will be utilized, the backup administrator can configure Oracle Secure Backup to maximize hardware utilization, schedule backups during non-peak periods and minimize network backup traffic utilizing storage area networks (SAN).

SECURING DATA AND ADMINISTRATIVE DOMAIN OPERATIONS

Data is the life-blood of business and must be guarded against malicious intent while in active state on production servers or preserved state on tape. Data center security procedures are key to restricting physical access to servers, data, and company networks. As data is preserved onto tape, Oracle Secure Backup works in parallel with security policies providing secure inter-domain transport of data and

control messages, restricts access to authorized backup administrators and writes encrypted RMAN backups to tape.

Backup Encryption for the Oracle database 10.2 forward

Utilizing RMAN backup encryption, database backups may be encrypted to tape with three configurable modes of operation:

- **Transparent mode is best suited for day-to-day backup operations. Requires Oracle Encryption wallet. (Default mode)**
- **Password mode is useful for backups that will be restored at remote locations. Password required.**
- **Dual mode is useful when most restorations occur onsite using the Oracle wallet, but occasionally required off-site restoration without access to the wallet.**

Host Authentication and Secure Network Communications

Leveraging proven secure socket layer (SSL) technology employed by Oracle Advanced Security Option, Oracle Secure Backup utilizes a mature SSL implementation optimizing performance and reliability backed by Oracle. In UNIX / Linux / Windows environments using SSL, Oracle Secure Backup helps safeguard the backup domain providing:

- Two-way server authentication
- Encrypted backup and restore control messages
- Encrypted data while in transit over the network

Backup Encryption for the Oracle Database to Tape

Beginning with Oracle Database 10g Release 2, database backups may be encrypted by RMAN and written to tape in encrypted format by Oracle Secure Backup. Our integrated encryption solution offers customers key advantages:

- Encryption keys may be transparently managed by the Oracle database
- Data never leaves the database except in encrypted format protecting critical data from unauthorized employees

RMAN encrypted backups are decrypted automatically during restore and recover operations, as long as the required decryption keys are available, by means of either a user-supplied password or the Oracle Encryption Wallet.

User level Access Control

Oracle Secure Backup provides user-level access control based on valid password and associated user rights. Each configured user must be assigned to a set of privileges, referred to as a class, to perform any data protection operations within the domain.

With 18 specific backup and restore rights, backup administrators can exercise a high degree of control over user access within the domain. Select from five pre-defined classes with varying degrees of authority from "admin" to "reader" class or create new classes tailoring privileges to your environment.

A user may be assigned to only one class of privileges but a class may have multiple users.

EFFECTIVE MEDIA AND DEVICE MANAGEMENT

Designed with the system administrator in mind, Oracle Secure Backup provides an easy to use management framework for effectively managing tapes and devices.

Oracle Secure Backup offers maximum flexibility for tape device configuration to optimize tape resources. A tape library may be directly attached to one media server or to multiple servers referred to a multi-hosted library. In Storage Area Network (SAN) environments, multiple servers connected to a fibre switch may share accessible tape resources. Oracle Secure Backup automatically manages the tape resource contention dynamically sharing drives in SAN environments.

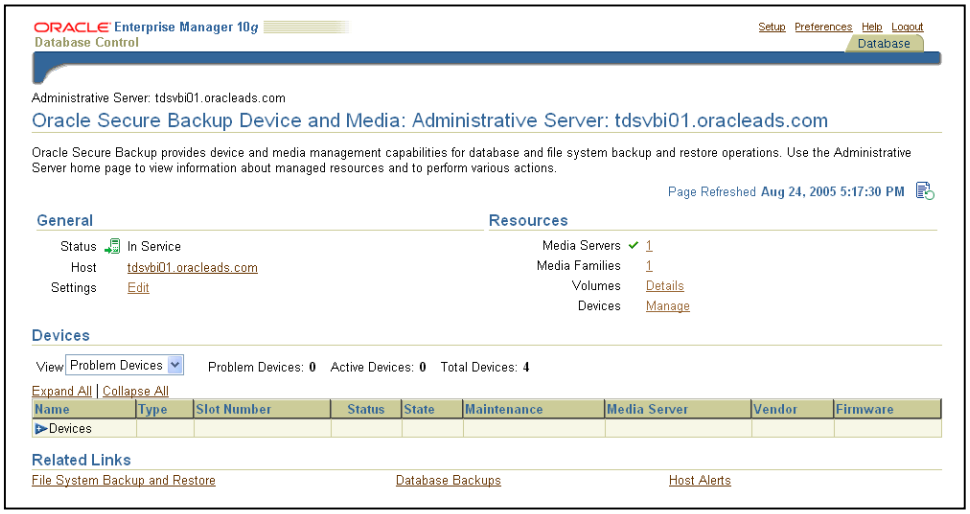
Volumes may be grouped into storage classifications called media families which have user-defined attributes such as write-windows, recycling policies based on time or content. A common practice is to configure a media family based on backup type, which often shares similar retention policies.

Offering two tape recycling policies, Oracle Secure Backup protects data from being overwritten based on the expiration method chosen:

- **Content-managed volumes** tailored for RMAN backups of the Oracle database allow RMAN control over determining when individual backup content is no longer needed. Oracle Secure Backup won't overwrite these tapes until RMAN has communicated content obsolescence.
- **Time-managed volumes** used for file system backup have retention times associated at the tape level instead of individual content of tape.

When backups are written, the tape block location is associated with the backup in the catalog. Therefore, during restores the tape can be automatically forwarded to the correct tape location without requiring the time consuming process of tape reads to find desired files.

As the only media manager software integrated with Enterprise Manager, Oracle customers will have instant familiarity with the interface making Oracle Secure Backup an easy extension to database backup and recovery strategies.



Backup administrators may use EM to evoke RMAN backup and restore operations as well as manage most administrative tasks within the domain.

PROTECTING THE ORACLE DATABASE USING TAPE

Automated Tape Recycling:

- **Content-managed volumes** **for Oracle database backups allow RMAN control of content expiration.**
- **Time-managed volumes** **for file system backups have a user-defined expiration period associated with the volume not content of volume.**

Since Oracle 8.0, RMAN is the recommended backup utility for the Oracle database with intimate kernel knowledge for reliable, automated, online protection to disk and integrated with numerous 3rd party media management products for tape backups. Oracle Secure Backup is an alternative to expensive, 3rd party tape backup utilities, providing the media management layer for RMAN tape utilization.

As an Oracle product, Oracle Secure Backup offers a knowledgeable, single-vendor technical resource for complete Oracle database protection. When installing Oracle Secure Backup, the SBT libraries for RMAN tape backups are automatically linked.

Delivering the fastest database tape backup, Oracle Secure Backup only backups up used blocks for Oracle Database 10.2.0.2 forward making backups faster and smaller saving tape on tape consumption.

Retention Periods for Database Backups

Retention periods for RMAN backups are best managed by RMAN not the media manager layer since RMAN knows exactly what files and logs are required to successfully recover the database meeting defined retention periods. In Oracle Secure Backup, tape retention periods honor RMAN authority when using content-managed volumes.

The RMAN retention period may be defined in one of two ways:

- **Recovery Window** is the time period for which the database must be recoverable. All backups and associated logs will be retained for the defined recovery window setting.
- **Backup Redundancy** defines how many full backups must be retained.

Regardless of which type of retention is configured, Oracle Secure Backup must be notified by RMAN when a backup is no longer needed. By issuing the RMAN DELETE OBSOLETE command, RMAN communicates which backup pieces are no longer needed to Oracle Secure Backup. As appropriate, Oracle Secure Backup will associate a "deleted" attribute with the backup piece. Once all backup pieces on a single-volume have the "deleted" attribute, then Oracle Secure Backup considers the volume no longer write-protected and will reuse the tape for other backups as needed.

Database Backups to Disk and Tape

In Oracle Database 10g, RMAN introduced the Flash Recovery Area, a unified disk storage location for all recovery related files for the database with RMAN managed disk space. With the Flash Recovery Area and Oracle Secure Backup, a

"As a DBA, I feel better knowing the tape backup tool has database "intelligence" allowing tapes to be overwritten only when the content is marked as "deleted" by RMAN. My job is much easier having a one-vendor technical resource than our previous solution, affectionately called the run-around."

—May Yuan,
Principal Application Engineer,
Oracle Collaboration Suites

Deployed Oracle Secure Backup in the Oracle Collaboration Suite IT Organization

comprehensive disk and tape backup and recovery strategy for the Oracle database is easily deployed with integrated Oracle technology.

The advantage of using the Flash Recovery Area for disk backups rather than a media management disk backup is RMAN. Allowing RMAN control of backup operations for the database facilitates the most effective restore process. During restore, RMAN automatically restores from the best backup source from disk or tape. If the most current backup is not available, RMAN will failover to a previous backup for recovery without requiring any user intervention.

By defining retention periods within RMAN, the combination of disk and tape backups are utilized as appropriate to meet recovery requirements. When using the Flash Recovery Area and Oracle Secure Backup, the recommended RMAN retention policy is a defined Recovery Window. Both disk and tape backups will be used by RMAN to satisfy the user-defined Recovery Window.

If your recovery plan is architected to enable restoration from disk for "X" hours/day and then the remaining recovery window period from tape, the Flash Recovery Area should be sized to hold "X" hours/days of recovery related files. The amount of time backups remain within the Flash Recovery Area is determined by the amount of available disk space not a specific time setting.

Backing up the Flash Recovery Area to tape using Oracle Secure Backup can be easily accomplished by issuing one RMAN command: BACKUP RECOVERY AREA. Using this disk to tape backup method instead of performing a separate backup of the production database to tape, provides a few distinct advantages:

- Saves tape resource with optimized backups of the FRA eliminating unnecessary backup of files already protected to tape.
- Enables RMAN to utilize better restore intelligence from disk then tape as necessary, otherwise, RMAN would use the most recent backup regardless of media.
- Reduces I/O on production database since the Flash Recovery Area uses a separate disk group.

FILE SYSTEM BACKUP AND RESTORE

The Oracle Secure Backup Web Tool or uniform command line, OBTOOL, may be used for managing file system backup and restore operations. The Web Tool offers calendar based scheduling at the day, date and time or performs "on demand" backups for more immediate, one-time needs.

Full, cumulative and differential incrementals backup levels accommodate even the most demanding file system protection strategies. In addition, a full offsite backup level may be scheduled without interfering with the regular full/incremental schedule.

Designed for flexibility, file system backups can be performed at the file, directory, file system or raw partition level meeting even the most stringent requirements within user-defined backup windows. Being Oracle Database aware, Oracle Secure Backup can skip database files during file system backups efficiently solidifying your total backup and recovery strategy.

Defining what data to backup is conceptually similar for file system and database data. For the database, RMAN backup sets are created. For file system data, the user defines "datasets" which describes the list of files to be backed up. A dataset is a textual description employing a lightweight language to communicate how to build and organize files to be protected.

File system restoration is equally easy to perform. Data may be restored back to the original location or to alternative server as defined by the user. Tree-style browsing with multiple query options insures review of all or a few backup versions insuring the correct file(s) are restored.

CONCLUSION

Oracle Secure Backup 10.1 increases customer return on investment providing end-to-end tape data protection for Oracle environments at a fraction of the cost of other tape products. An integrated Oracle product, Oracle Secure Backup delivers centralized backup tape management ideally suited for Oracle customers.

Oracle Secure Backup reduces the cost and complexity of enterprise tape backup and recovery while delivering the reliability you'd expect from Oracle. Key benefits are:

- Secure tape protection for the Oracle Database through tight integration with RMAN supporting versions Oracle9*i* and Oracle Database 10g
- Multi-level security protecting data and backup communications
- Effective problem resolution with single vendor technical support saving valuable customer time.
- Heterogeneous tape protection for UNIX/Linux/Windows and NAS file system data
- Substantial cost savings since Oracle Secure Backup provides the media management layer for Recovery Manager, eliminating the need to purchase costly 3rd party backup utilities.

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