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Oracle Secure Backup:
Achieve 75 % Cost Savings with Your Tape Backup

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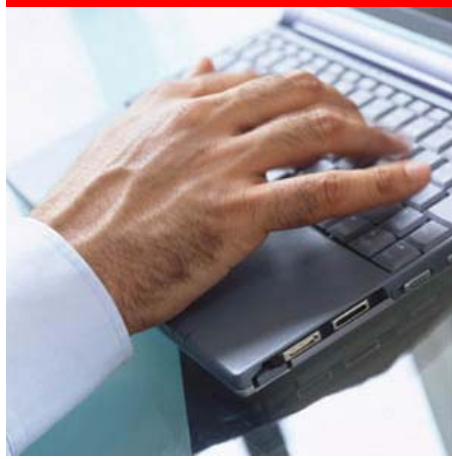
Oracle Secure Backup (OSB)

What is it?

- The best Oracle-optimized media management software
  - Fastest
  - Lowest Cost
- Quick poll
  - How many of you use Recovery Manager (RMAN)?
- Synergy Oracle style:
  - *OSB and RMAN are built by the same development TEAM!*

Now, for more details …

Program Agenda

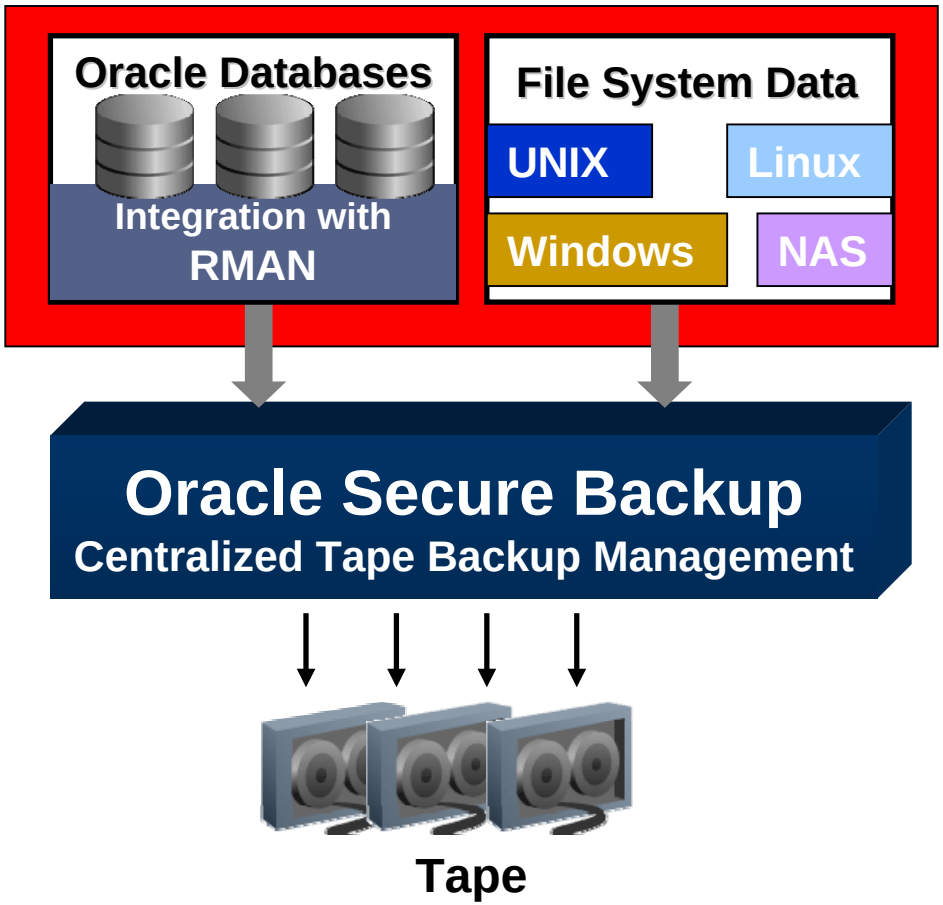


- Oracle Secure Backup (OSB) Overview
- Ease of Management
- Security and Backup Encryption
- Advanced Media Management
- Data Protection for Your Entire Environment
- Waters Corporation – Embedding OSB
- Backup to the Cloud
- Summary
- Q & A

Oracle Secure Backup 10.2

Integrated Tape Backup Management

ORACLE SECURE BACKUP

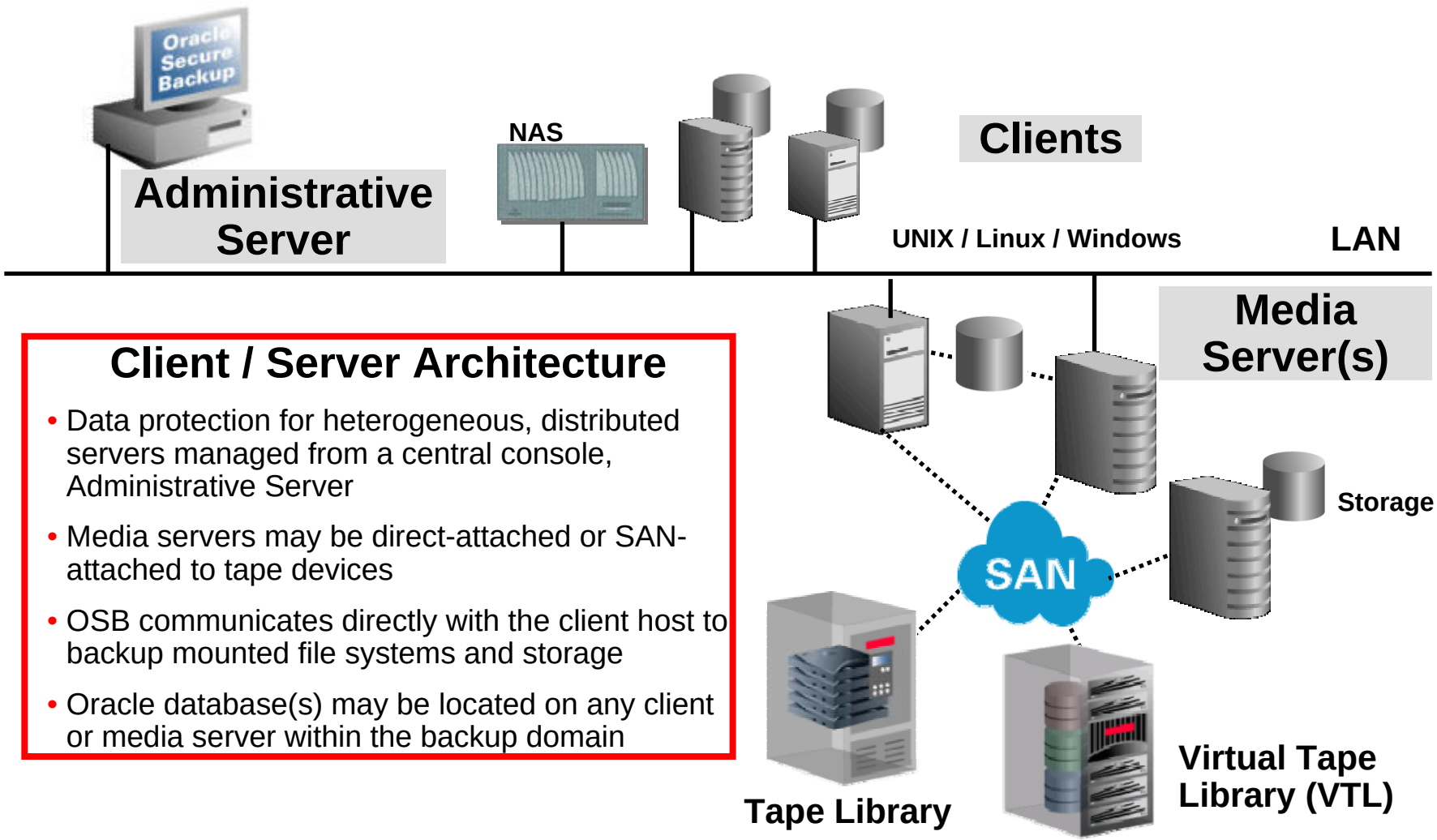


- Protects entire environment
  - Oracle Database 11*g*, Oracle Database 10*g*, Oracle9*i*
  - Heterogeneous file systems
- Built-in Oracle integration
  - Single-vendor advantage
- Fastest backup for Oracle
  - 25-40% faster than competition
- Lowest cost
  - $3,500 per tape drive
  - Free Express version bundled with Oracle Database

Oracle Secure Backup (OSB)

Centralized Tape Backup Software

ORACLE SECURE BACKUP



Client / Server Architecture

- Data protection for heterogeneous, distributed servers managed from a central console, Administrative Server
- Media servers may be direct-attached or SAN-attached to tape devices
- OSB communicates directly with the client host to backup mounted file systems and storage
- Oracle database(s) may be located on any client or media server within the backup domain

IT Backup Challenges

Addressed with Oracle Secure Backup

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OSB Differentiator

IT Data Protection: CHALLENGES

- Secure, unified data protection management:
  - Oracle database
  - File systems
- Fast; meeting backup windows
- Ease of management between system administration and DBA
- Scalable meeting growing infrastructure requirements
- Effective media management between multiple locations and/or tape copies
- Maximize device utilization: keep the tape drives spinning!
- Reduce IT infrastructure costs
- Reliable backup and restore

Oracle Secure Backup: CAPABILITIES

- Tightly integrated with RMAN achieving fastest tape backup by eliminating read and backup of
  - Unused database blocks
  - Committed undo
- Heterogeneous file system and NAS support with policy-based backup management insuring consistency across the backup domain
- Backup encryption and key management
- Automated tape vaulting and duplication
  - `RMAN RESTORE PREVIEW RECALL`
- Dynamic drive sharing
- Compact catalog growth
- Integrated with Oracle Enterprise Manager(EM)
- Low-cost, single-component licensing saves money and simplifies license management
- Reliability you'd expect from Oracle

IT Cost Savings… 75%+

Migration to Oracle Secure Backup

ORACLE SECURE BACKUP

		Oracle Secure Backup		Competitor	
		Server Size			
QTY	Description	Small	Large	Small	Large
4	Tape drives	$ 14,000	$ 14,000	$ 12,000	$ 12,000
4	Shared tape drives	$ -	$ -	$ 8,000	$ 8,000
1	UNIX media server	$ -	$ -	$ 10,000	$ 27,000
1	NAS media server	$ -	$ -	$ 3,500	$ 15,500
1	Linux media server	$ -	$ -	$ 5,000	$ 12,000
3	Windows clients	$ -	$ -	$ 7,785	$ 18,285
10	Linux clients	$ -	$ -	$ 25,950	$ 60,950
1	Vaulting (1 server / 4 drives)	$ -	$ -	$ 10,000	$ 10,000
1	Database option UNIX	$ -	$ -	$ 4,995	$ 16,495
1	Database option Linux	$ -	$ -	$ 1,295	$ 3,295
	Total Cost	**$ 14,000**	**$ 14,000**	**$ 88,525**	**$ 183,525**

Imagine how much annual maintenance you'll save!!!

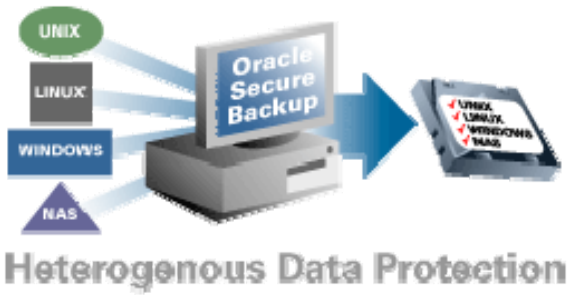
Ease of Management

Enterprise Backup Management

Oracle Secure Backup

ORACLE SECURE BACKUP

- Unified backup management in heterogeneous, distributed environments over LAN, WAN or SAN
  - Secure transport over networks utilizing SSL technology



- Scheduled or immediate backups
- Standards based for ease of use
  - Easily customized with scripts
- Broad tape device support:
  - Over 200 new and legacy devices
- Integrated Oracle product:
  - Oracle Enterprise Manager (EM)
  - Recovery Manager (RMAN)
  - Single technical resource from start to finish

Oracle EM Grid Control 10.2.0.5

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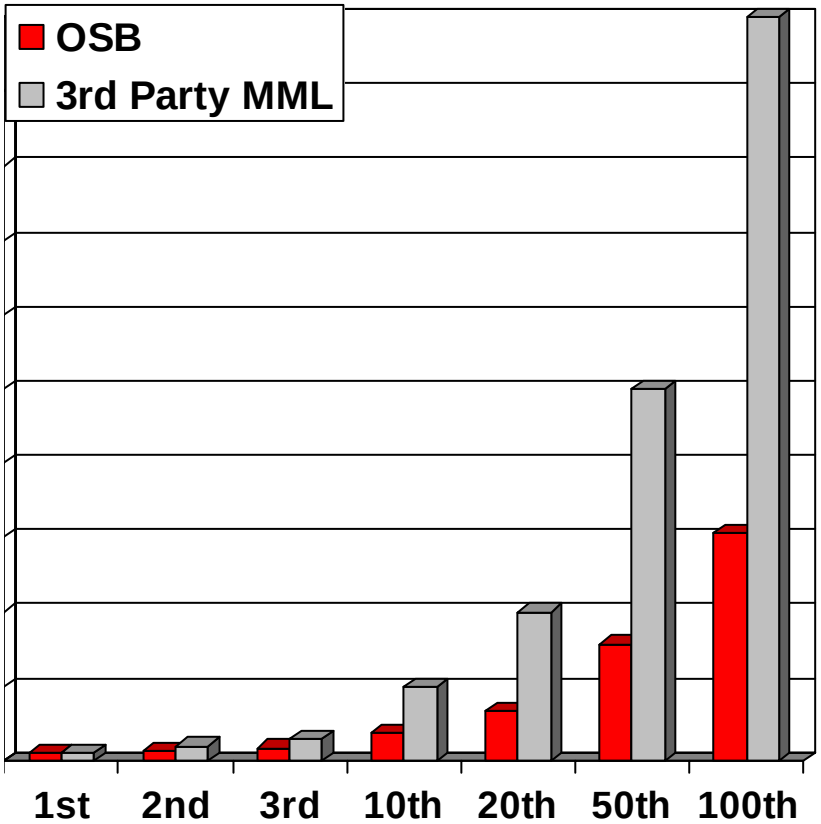
OSB Enhancements

- Manage both file system and Oracle database backup / restore operations
  - Previous EM Grid Control 10.2 releases supported database backup / restore operations only
- Management of advanced security and media life cycle policies:
  - Backup encryption
  - Tape rotation schedules
- OSB Administrative Server is monitored as an EM target
  - Provides basic monitoring, ie Administrative Server up/down
- EM alerts based on polling OSB Administrative Server
  - Failed backup / restore jobs and pending jobs due to resource availability or user input needed
- EM notifications based on user-configured metrics
  - Devices, host targets and backup / restore jobs

Compact Backup Catalog

Built-in Backup Metadata Deduplication



Oracle Secure Backup

- Catalog growth is proportionate to the change rate of the backup
- Filenames are not repeated within the catalog
- Compact Catalog = substantial storage savings!

3rd Party Media Manager

- Catalog size grows linearly with each additional backup without optimizations regarding redundant filenames / metadata storage

Flexible Tape Device Configuration

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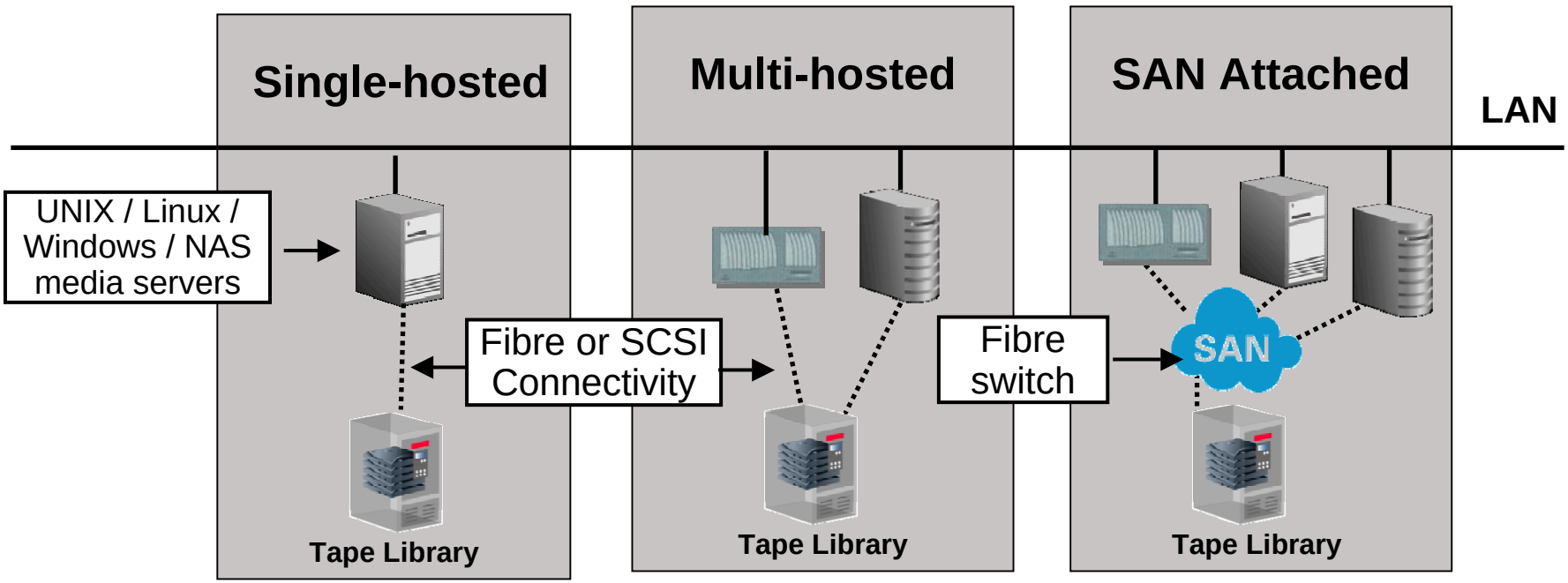

- OSB provides dynamic tape drive sharing in SAN environments maximizing drive utilization
  - NAS drive sharing with UNIX / Linux / Windows servers….NOT available with most 3rd party media management products

Data Protection Security

Security: Data and Backup Domain

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Policy-based management

- **Securing backup data on tape**
  - Backup encryption protects data on tape while onsite, offsite or lost
  - User-defined encryption algorithms AES128, AES192 or AES256
  - Backup encryption policies at backup, host or domain level

- **Guarding access to the backup domain**
  - User-level access control
  - Direct access to tape devices restricted to “Trusted” hosts

  - Embedded SSL technology provides secure transport of backup data and messages between two-way authenticated servers

Backup Encryption To Tape

Host Policies and Key Management

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Backup Encryption Policies

Encryption Key Policies

Host obe11g	
IP interface name(s):	obe11g.us.oracle.com
Status:	in service
Roles:	client, admin, mediaserver
Access method:	ob
Encryption:	required / allowed
Algorithm:	aes128 / aes192 / aes256
Rekey frequency:	duration 1 month / never / system default / per backup
Key type:	transparent / use passphrase / verify passphrase
TCP/IP buffer size:	bytes
Key store:	Add a key to the keystore without making it active
Certificate key size (in bits):	1024
	Suppress communication with host

- Backup encryption policies defined at global,host, backup or volume level
  - OSB encryption of RMAN backups configured at the global or host level (not backup level)
- RMAN encrypted backups will not be re-encrypted by OSB

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NOTE: *OSB does NOT encrypt NAS backups*

Transient Backup Encryption

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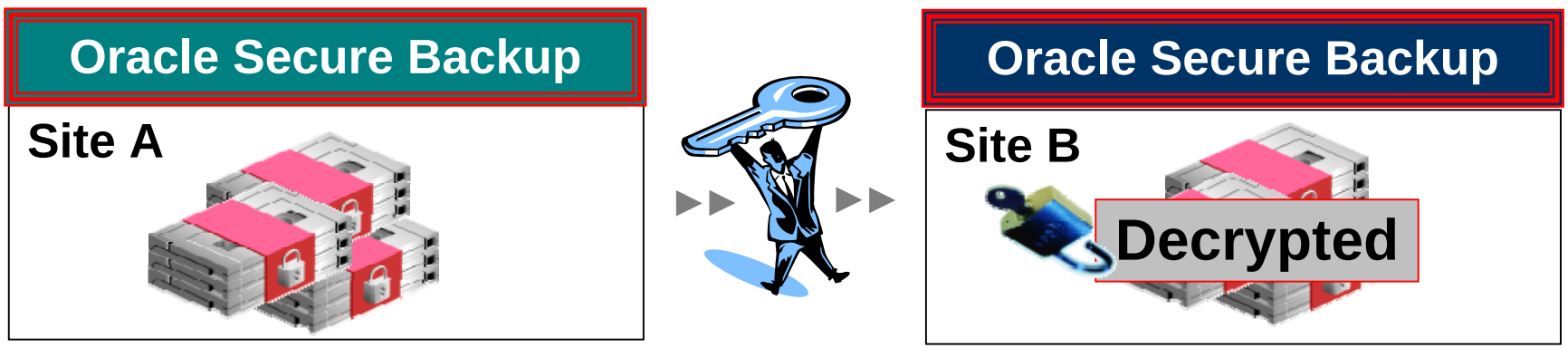
- Ideal for backups intended to be restored at alternate site or OSB domain
- Transient encrypted backups are one-off type backups
  - Configured as part of an immediate backup not backup schedule
  - User-defined passphrase generates encryption key for the backup job which applies to all volumes in the set
- Prior to restore within alternate OSB domain, tapes must first be imported to update the OSB catalog
- Passphrase input during restore decrypts backup



Backup Encryption Keys

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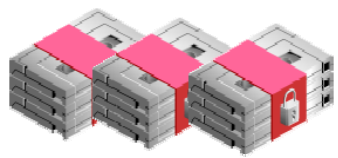
- Encryption key type determines method of key generation
  - Policy-based encryption key settings:
    - Transparent – Randomly generated keys
    - Passphrase – Key(s) generated based on user-defined passphrase
  - Transient encrypted backups:
    - Key(s) generated based on user-defined passphrase associated with that backup job
- Keys reside in host specific key store on OSB Administrative Server
  - Encrypted backups performed by RMAN use encryption keys which are managed by the database not OSB
- Rekey frequency policy automates key regeneration
  - Transparent key types are automatically rekeyed
  - Email notification alerts user(s) to update passphrase key type
    - Doesn't apply to transient encryption keys



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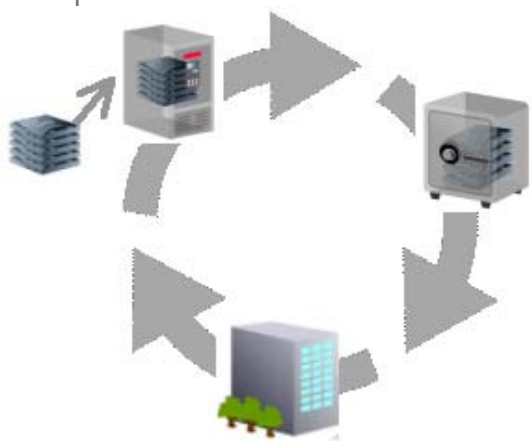
Advanced Media and Device Management

The Life of Backup Tapes

Media Lifecycle Management – Typical Scenario

Typical Media Requirements

- Tapes are appendable for 1 week or until full
- Retain for backups for 2 years
  - Store offsite for 2 years
  - Return tapes to original site for reuse once expired
- Duplicate tapes same day as created
  - Store tapes onsite for 2 months:
    - 1week within the library
    - Then 1 month in media cabinet
    - Reuse tapes to the library at end of 2 month period



Media Management:
Retention, Duplication and Vaulting

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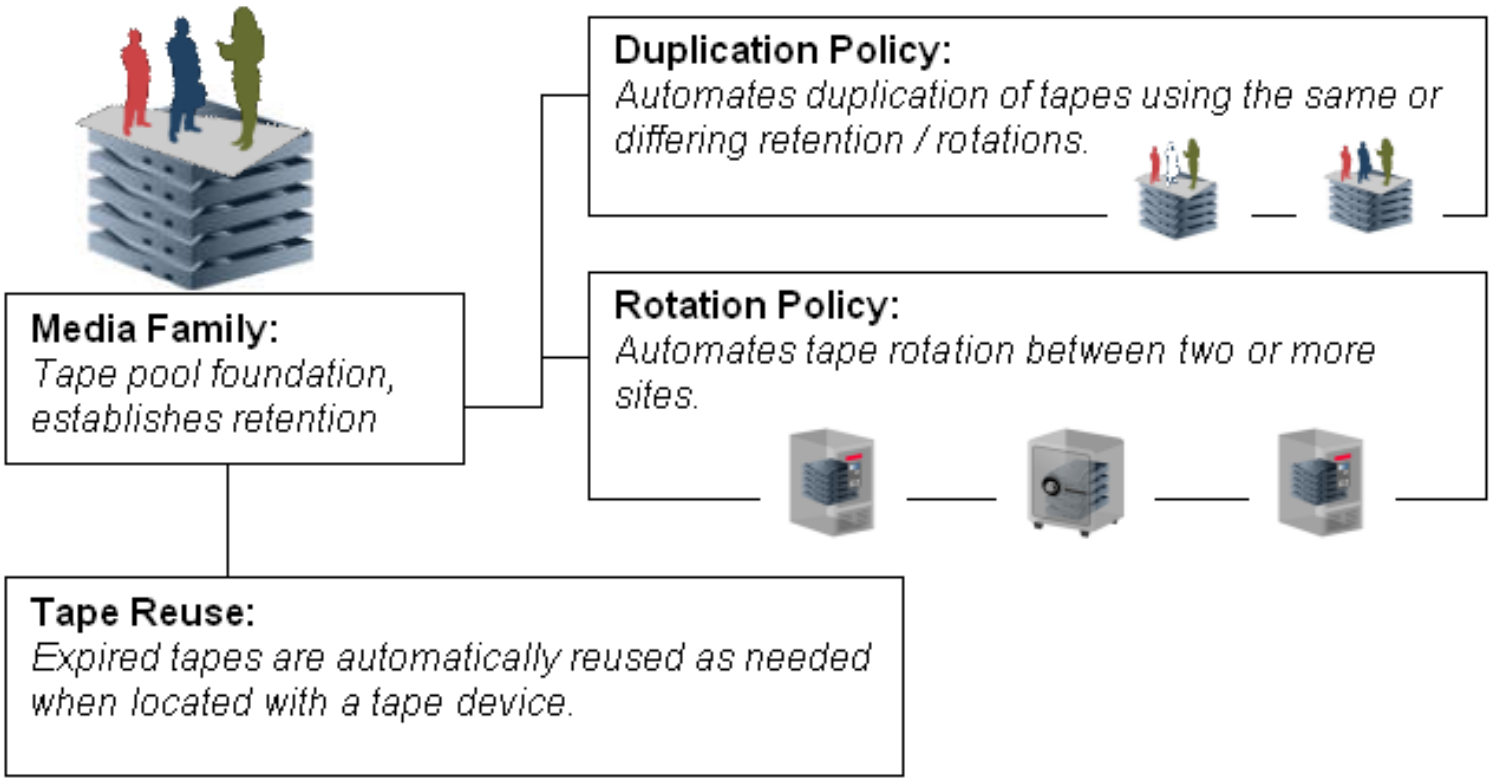
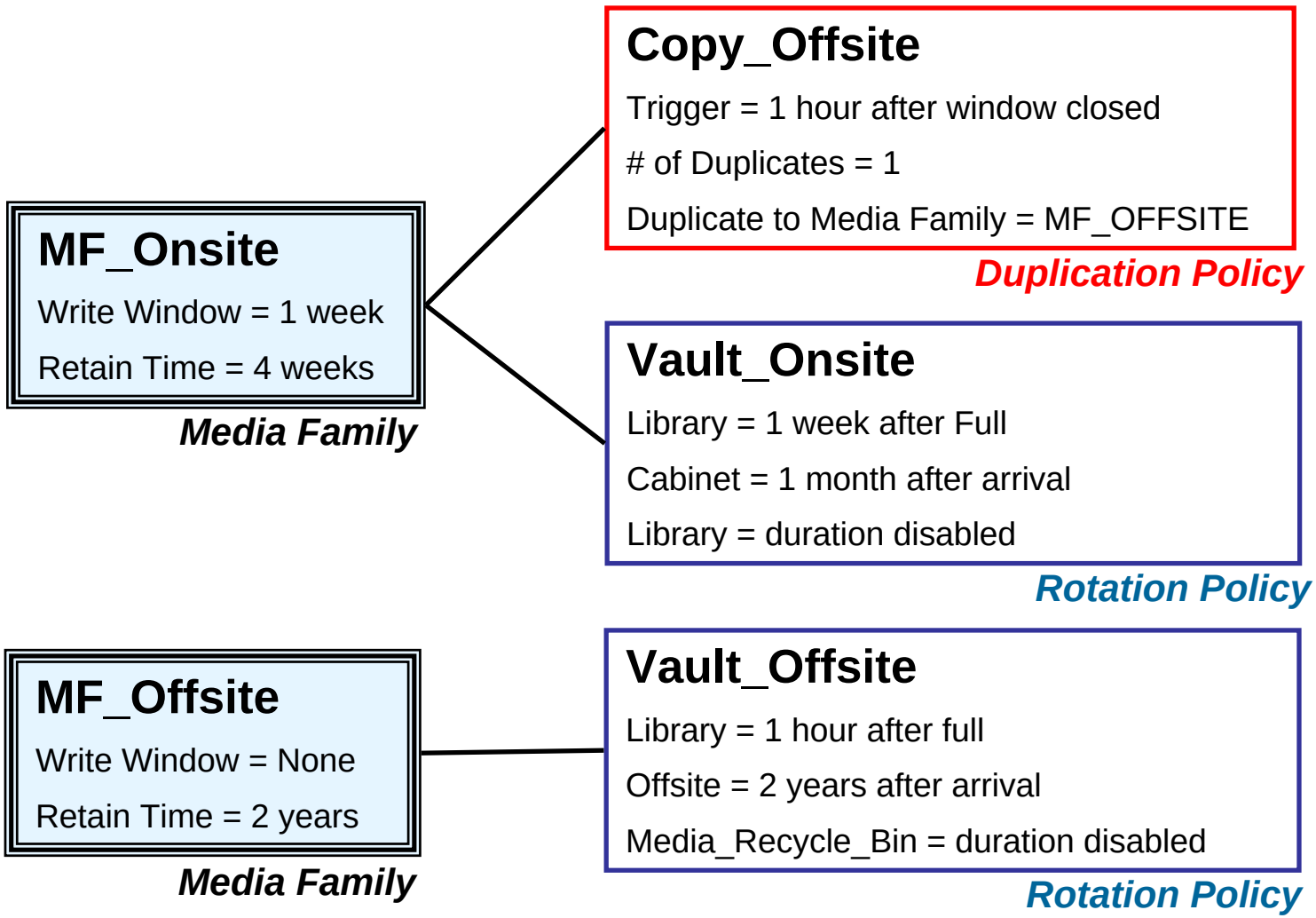


- Tapes managed from first write to reuse based on user-defined media families, duplication and rotation policies

Media Lifecycle Management:

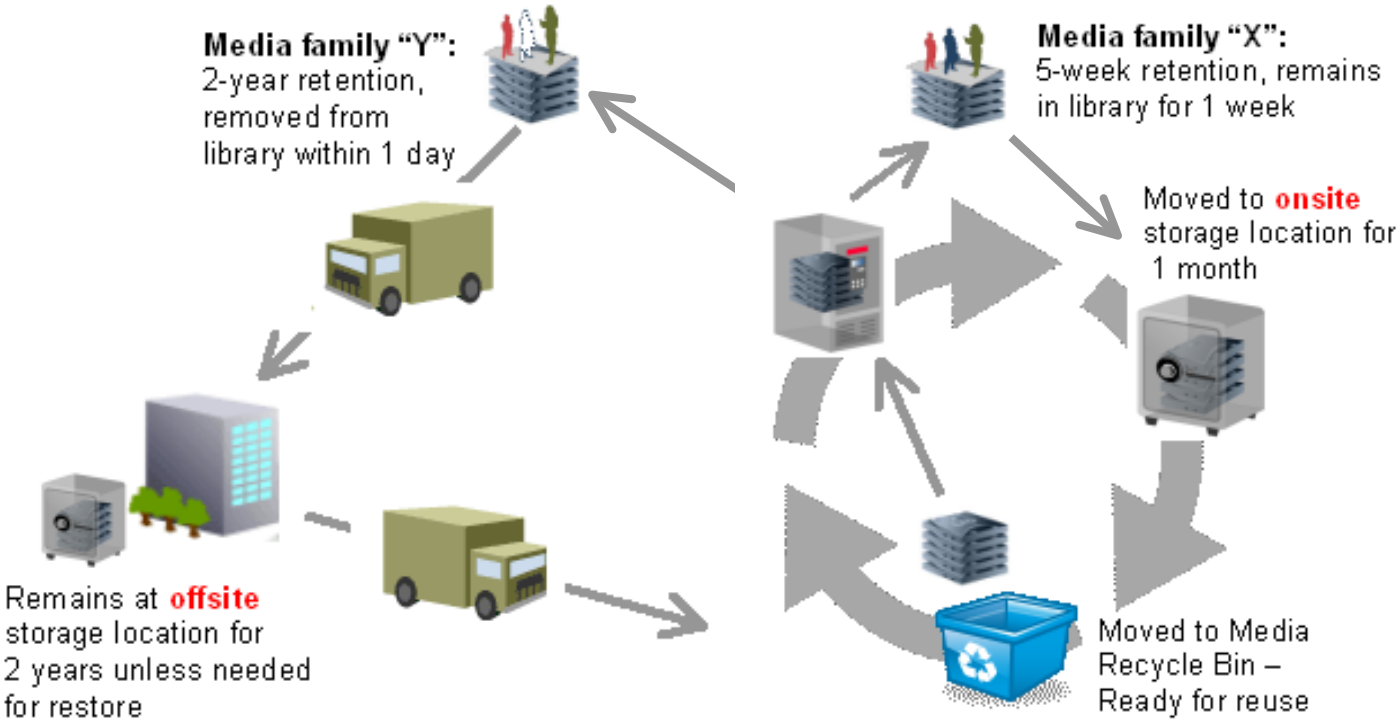
OSB – Policies for that Typical Scenario



Policy-Based Media Management

…In Action

5-Week Tape Retention



2-Year Tape Retention

- Tapes duplicated to another media family may have different retention and rotation schedule than original tape

Managing Tape Vaulting

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- **Rotation policy defines when tapes become eligible to move to next planned location**
  - Flexible scheduling options per location determining when catalog is scanned to identify eligible tapes for rotation
  - Location scan(s) automatically generate media movement jobs
- **Reporting**
  - Pick and distribution reports
  - Location, schedule and exception reports

Oracle Secure Backup Location Report For Location DC_Austin		
Volume	Next Location	Move Date
RMAN-DEFAULT-000002	Media_Recycle_Bin	2009/02/26.12:26
OSB-CATALOG-MF-000005	Media_Recycle_Bin	2009/02/26.12:26
RMAN-DEFAULT-000004	Media_Recycle_Bin	2009/02/26.12:26

What about VTL Environments?

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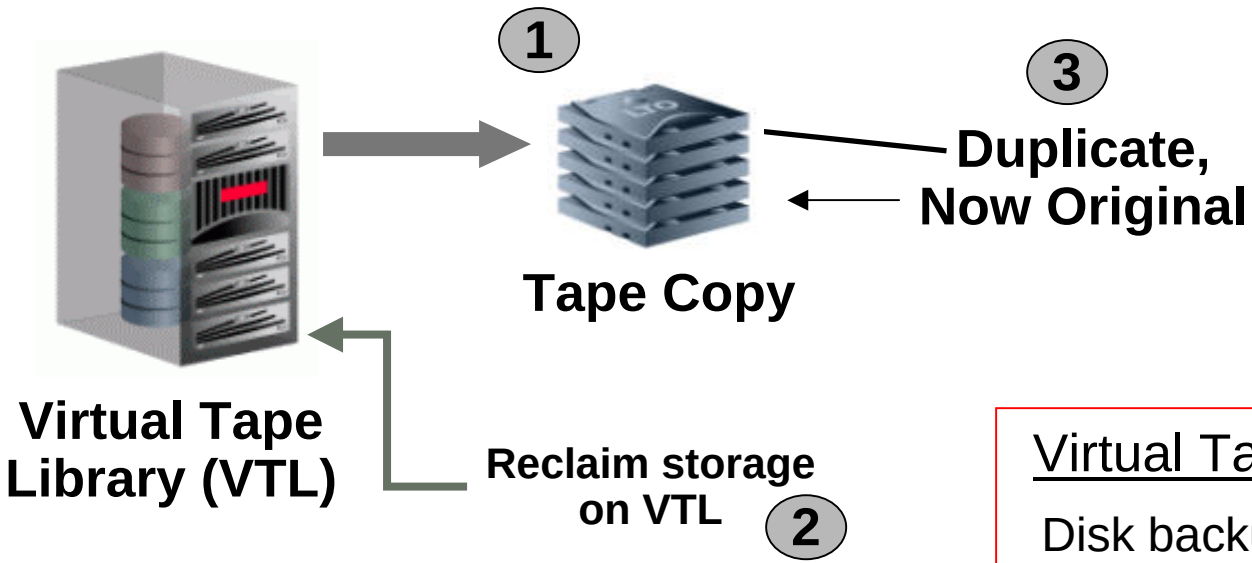
Automated Migration from Virtual to Physical Tape

- Virtual tapes migrated to physical tape per user-defined policy
  - Duplication policy enables “migration” to same or different media family



Virtual Tape Libraries (VTL)

Disk backup appliances that emulate tape devices and media

Data Protection for Your Entire Environment

Fastest Database Backup

Less Blocks Read and Backed Up

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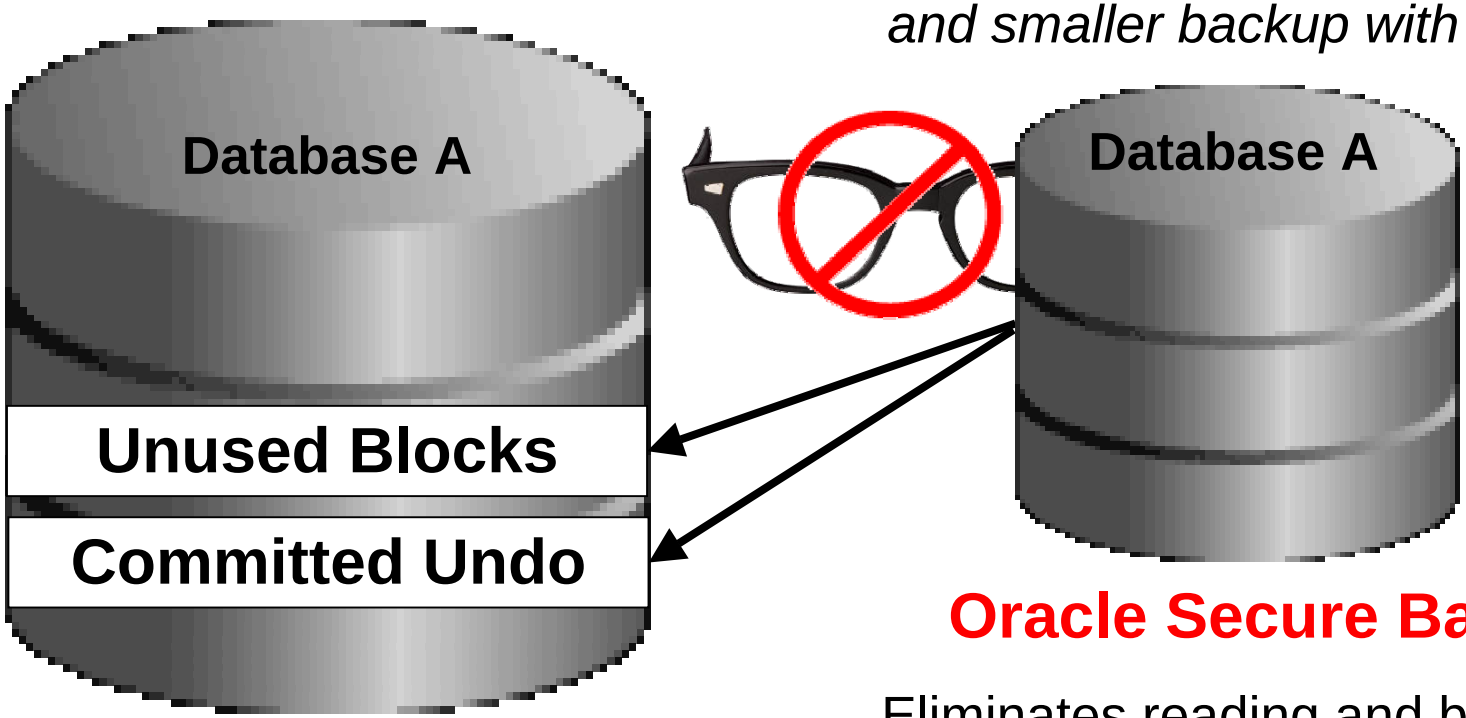
Same database, just more efficient and smaller backup with OSB



3rd Party Media Managers

Oracle Secure Backup

Eliminates reading and backing up:

- Unused blocks
- Committed Undo

Choosing Tapes and Devices
Backup Storage Selectors

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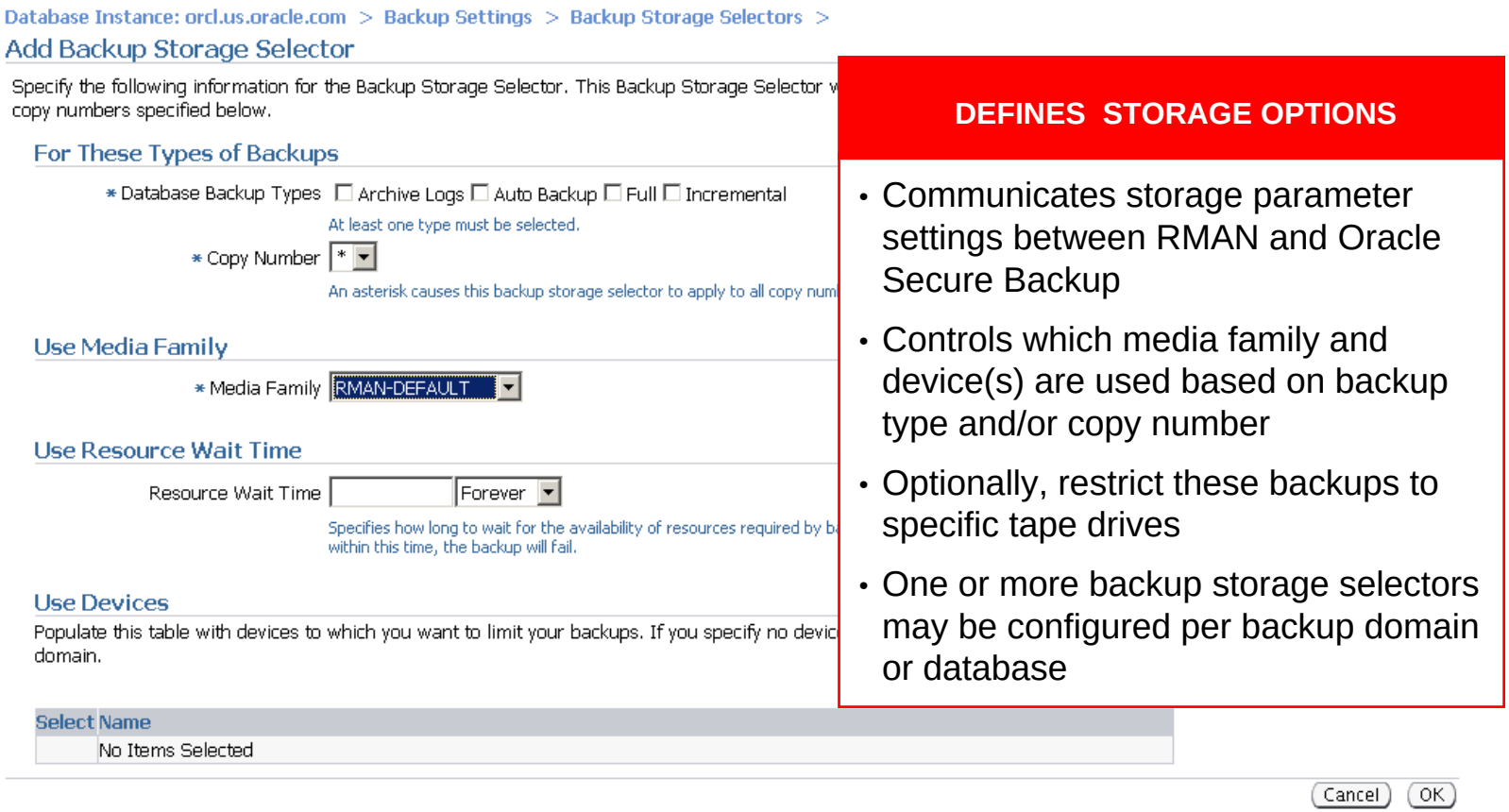

DEFINES STORAGE OPTIONS

- Communicates storage parameter settings between RMAN and Oracle Secure Backup
- Controls which media family and device(s) are used based on backup type and/or copy number
- Optionally, restrict these backups to specific tape drives
- One or more backup storage selectors may be configured per backup domain or database

NOTE: *Backup Storage Selectors only pertain to RMAN backups.*

Oracle Database Restore

Using RMAN and OSB

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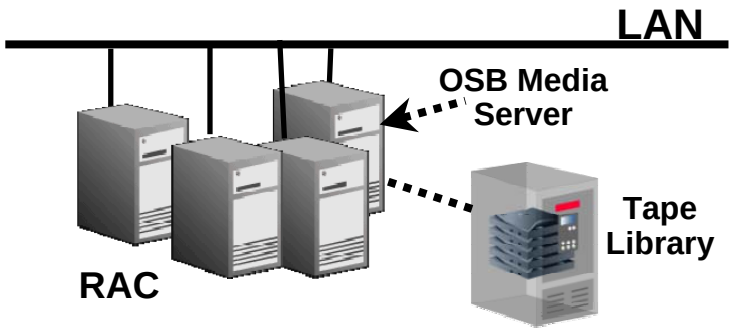
- Utilize RMAN or Oracle Enterprise Manager (DB Control or Grid Control) restoring to original or alternate location
- Backup pieces on tapes stored at alternate locations must first be recalled to the tape library prior to restoration
  - In Oracle Database 10gR2 forward, RMAN commands identify which tapes are offsite:
    - Issue RMAN **restore database preview** command to obtain a list of offsite tapes needed for restoration
    - Issue RMAN **restore database preview recall** command to initiate an OSB media movement job to return the tapes from alternate location
- Decryption of OSB encrypted backups:
  - Encrypted backups will be automatically decrypted during restoration within the same OSB domain

RAC Performance Considerations

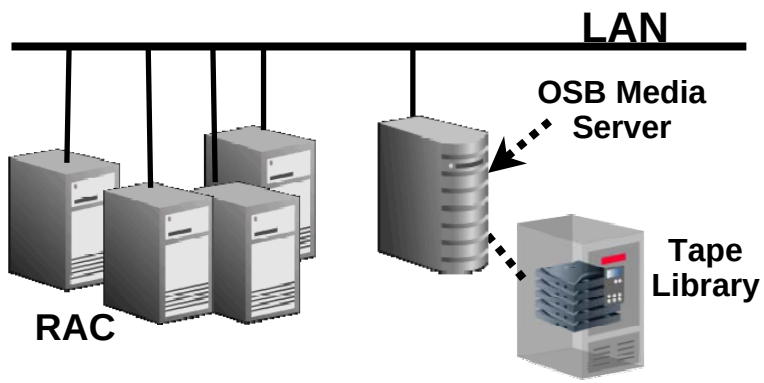
Remote or Local Backup to Tape

LOCAL TAPE BACKUP



- One or more RAC nodes may be configured as an OSB media server
- RMAN backup/restore operations should only be performed on RAC node(s) direct attached to tape device
- `configure channel c1 device type sbt..connect <node connect string>;`

REMOTE TAPE BACKUP



- Remote backup of RAC nodes over the network to tape device
- Performance not affected by which node(s) perform backup/restore
- Leverage RMAN dynamic channel allocation (Oracle database 10gR2 forward)

Install OSB on all RAC nodes to backup local files

Protecting File System Data

Datasets Define What to Backup

Dataset

Name: Example_OSB_Workshop

```
# Assumes another dataset called common-exclusions was created
# For example the common-exclusions dataset could be exclude name tmp,
#  exclude name *.tmp, exclude name *.temp, exclude name *.backup

include path /home/usr1
include path /home/usr2
include host stc1
include host stc2
include host stc3 {
 include dataset Common-exclusions
 include path /home/usr3
  before backup optional "/etc/local/nfy '/usr3 beg
  after backup optional "/etc/local/nfy '/usr3 end'
 include path /home/usr4 {
  exclude name *.junk  } }
```

User-Defined Datasets

- Create a dataset to define the hosts, directories and files to backup on the file system(s)
- Use include / exclude statements within a dataset for precise definition of backup content
- Use "exclude oracle database files" directive to avoid backing up Oracle-related files from a file system backup

File System Restore

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- Utilize OSB Web Tool, EM Grid 10.2.0.5, or command line for restoration to original or alternate location
- Leverage tree-style browsing of the OSB backup catalog for single file or directory restore
- OSB automatically recalls tapes located at alternate locations to perform the restore operation
  - Restore job remains in pending state until tapes are returned to an accessible tape device
- Restrict restoration from specific tape drives as required, if not, OSB will leverage any available tape drive accessible to the tape
- Decryption of transparent or passphrase encrypted backups will be performed automatically within the same OSB domain without user intervention
  - Transient encrypted backup (usually at alternate OSB domain) require user-input of passphrase used to encrypt backups

Waters Corporation; Embedding OSB

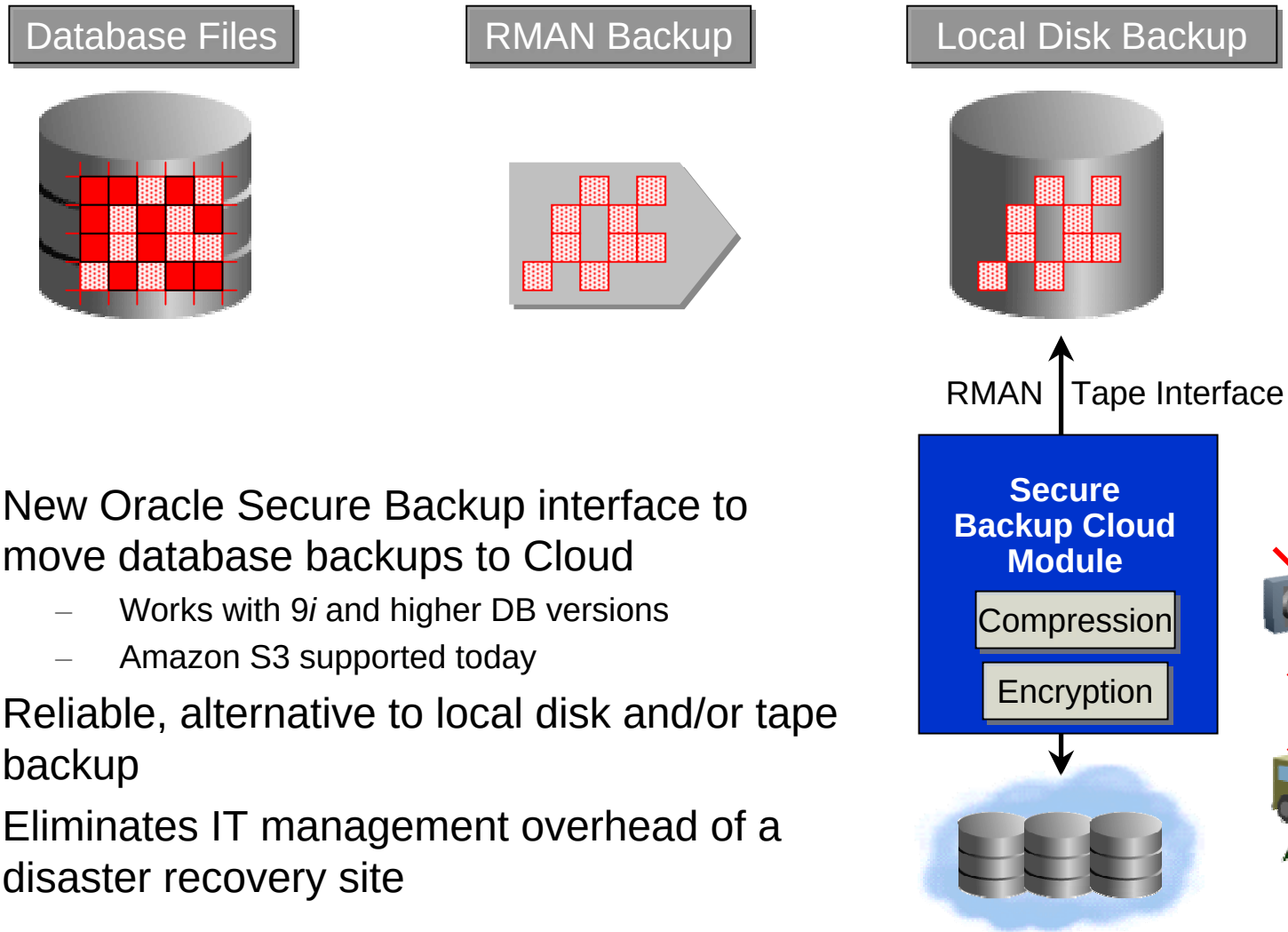
Oracle in the Cloud

Oracle Secure Backup Cloud Module

- A new library that interfaces with RMAN and Amazon S3
  - Using RMAN's SBT (Tape) Interface
  - Part of Oracle Secure Backup product family
  - Licensed based on number of concurrent parallel streams (RMAN channels)
  - Includes encryption and compression capability
- Currently available on Linux 32, Linux 64, Windows 32
  - Cloud Backup Installer included in Oracle AMIs
  - OTN download coming soon for on-premise databases
- Fully compatible with existing backup scripts and EM

See Cloud Backup TWP on OTN for details

Offsite Backups in the Cloud



- New Oracle Secure Backup interface to move database backups to Cloud
  - Works with 9*i* and higher DB versions
  - Amazon S3 supported today
- Reliable, alternative to local disk and/or tape backup
- Eliminates IT management overhead of a disaster recovery site

Database Backup to Cloud – Benefits

- Fast restore at DBA fingertips
  - Eliminates need to access internal storage resources (personnel and/or hardware) to perform Oracle database restore
    - Cloud backups are always accessible!
  - Restore without need to call storage group or wait for tapes to return from offsite
- Quickly create test, dev DBs using cloud backups
- Secure, reliable, offsite and redundant disk backups
  - S3 makes several redundant copies for data
- Cost effective
  - No capital expense
  - Stores critical data offsite without overhead cost of another data center

Why Oracle Secure Backup? — Top 5 Reasons

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1. Reliable, built-in integration with Oracle
2. Fastest Oracle database backup to tape
3. Policy-based backup management
4. Advanced Media Management and Security
5. Lowest-cost enterprise tape backup solution

For More Information

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HA Sessions, Labs, Demos From Oracle Development

Mon, Sep 22

- 2:30 pm - Database 11*g*: Next-Gen HA, Moscone South 103

Tue, Sep 23

- 9:00 am - Active-Active Data Centers, Moscone South 103
- 11:30 am - Sharding with Oracle, Moscone South 302
- 11:30 am - HA with Oracle VM, Moscone West 3024
- 1:00 pm - Active Data Guard, Moscone South 104

Wed, Sep 24

- 9:00 am - Fusion Middleware Grid HA, Marriott Nob Hill AB
- 11:30 am - RMAN Best Practices, Moscone South 103
- 1:00 pm - Database in the Cloud, Moscone South 305
- 5:00 pm - Data Guard & Real Application Testing, Moscone 102

Wed, Sep 24 (contd.)

- 5:00 pm - EM in Secure MAA, Moscone West 2001
- 5:00 pm - E-Business Suite HA, Moscone West 2002/04

Thu, Sep 25

- 9:00 am - Oracle Secure Backup, Moscone South 102
- 10:30 am - Streams Replication, Moscone South 102
- 12:00 pm - Rolling Database Upgrades, Moscone South 103
- 1:30 pm - Streams Performance, Moscone South 102
- 3:00 pm - Oracle Grid Computing, Moscone South 303
- 3:00 pm - E-Business Suite R12 MAA, Moscone West 2007
- 3:00 pm - Siebel MAA, Moscone South 308
- 3:00 pm - Fusion SOA HA & Scalability, Marriott Salon 14/15

Hands On Labs - Thu, Sep 25

- 10:30 - 11:30 am, 12:00 - 1:00 pm - Active Data Guard, Marriott Golden Gate A3

DEMOgrounds, Mon-Thu

- Active Data Guard, Streams, Oracle Secure Backup, RMAN/Flashback, MAA


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