

# Implementing an Enterprise Class Database Backup and Recovery Plan

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# 7 Seconds

The amount of time it takes to lose a customer on the internet

# \$7800

The estimated cost of down time per minute  
for an e-business

**Why perform backups?**

**Data is Most Valuable**

**Hardware and software can be replaced**

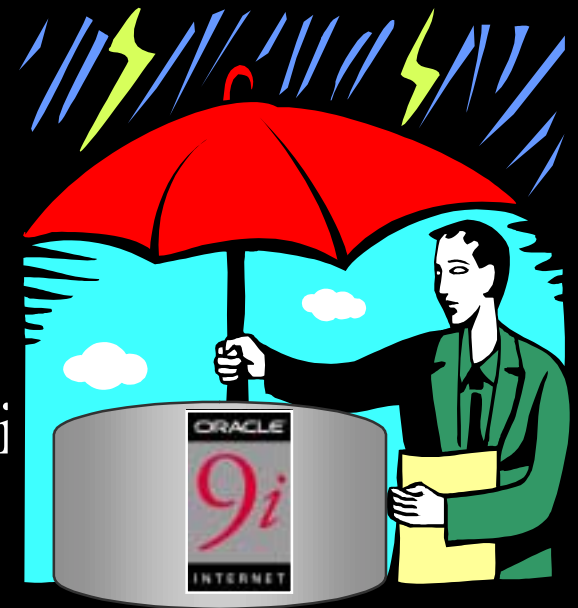
# Agenda

- How do you protect your data?
  - 4 Steps to successful backup and recovery
    - Design a backup strategy
    - Determine a backup type
    - Identify what to backup
    - Select a backup tool
- Backup scenarios
- Summary

**Step 1.**  
**Design a backup strategy**

# Backup Strategy Planning

- What do you plan for?
  - Media failures
  - Software failures
  - Human errors
  - Acts of nature
- Document backup and recovery procedures
- Ensures more choices available during recovery







# Backup Strategy Phases

## Identify Resources

### Hardware Configuration

Vendor/Model

Operation System

Version/Patch release

Disk Capacity

No. of Disk/Controller

Availability Requirement

Media Mgmt Vendor

Type and no of tapes

### Database Configuration

Instance Name

Host Name

RDBMS Version

Size of Database

Backup Method/Frequency

Backup Method/Time to Restore

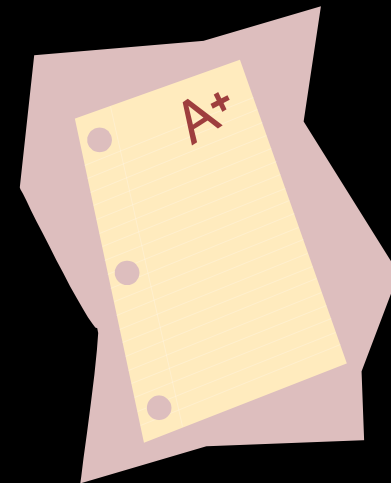
Datafile mount point(s)





# Backup Strategy Phases

## Testing



- Why test?
  - Ensure that your backup *and recovery* is working
  - Ensure recovery skills and procedures remain current
- What to test?
  - If a disk failed, would your DBA be able to perform a full recovery on the files from that disk?
  - What do you do if a table was dropped from the production instance?
  - How would you recover from a corrupted table block?
  - Can you recover the database server in the event of a fire?

**Step 2.**  
**Determine a backup type**

# Backup Types

Type	Definition
Full	A backup that backs up all used data blocks
Incremental	A backup of datafiles that includes only the blocks that have changed since a previous incremental backup
Online	A backup of any part of the database when it is open
Offline	<del>A backup of any part of the database when it is mounted but not open</del>







**Step 3.**  
Identify what to backup

# What should you backup and how often?

- Oracle Database Architecture
  - Datafiles
  - Archive logs
  - Control file
  - Configuration Files
- Determine your goal MTTR
  - Cost-effective detection of outage
  - Well defined action plans
  - Fast restore and recovery of the database
  - Opening the database quickly







**Step 4.**  
Select a backup tool

# Oracle Media Recovery

- Oracle was designed to recover from a media failure and return the database to a transaction-consistent state without data loss
- Database can be in production during most media recovery scenarios
- The most important thing required to recover from a media failure
  - Backups of the database must be available!

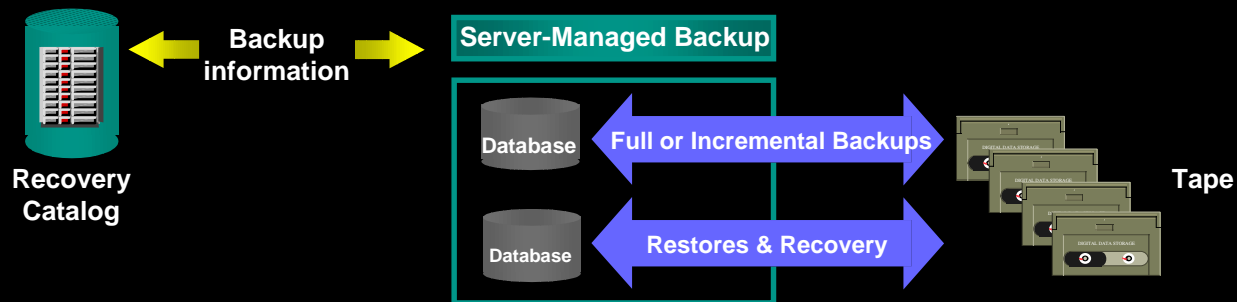


# Recovery Manager (RMAN)



- Oracle's strategic backup & recovery tool
- Provides an integrated, automated, database-managed backup, restore, and recovery process
- Corrupt block detection during backup and restore and the ability to validate backups
- Automatic parallelization of backup, restore, and recovery
- Request backup at database, tablespace, or datafile level
- Comprehensive reporting

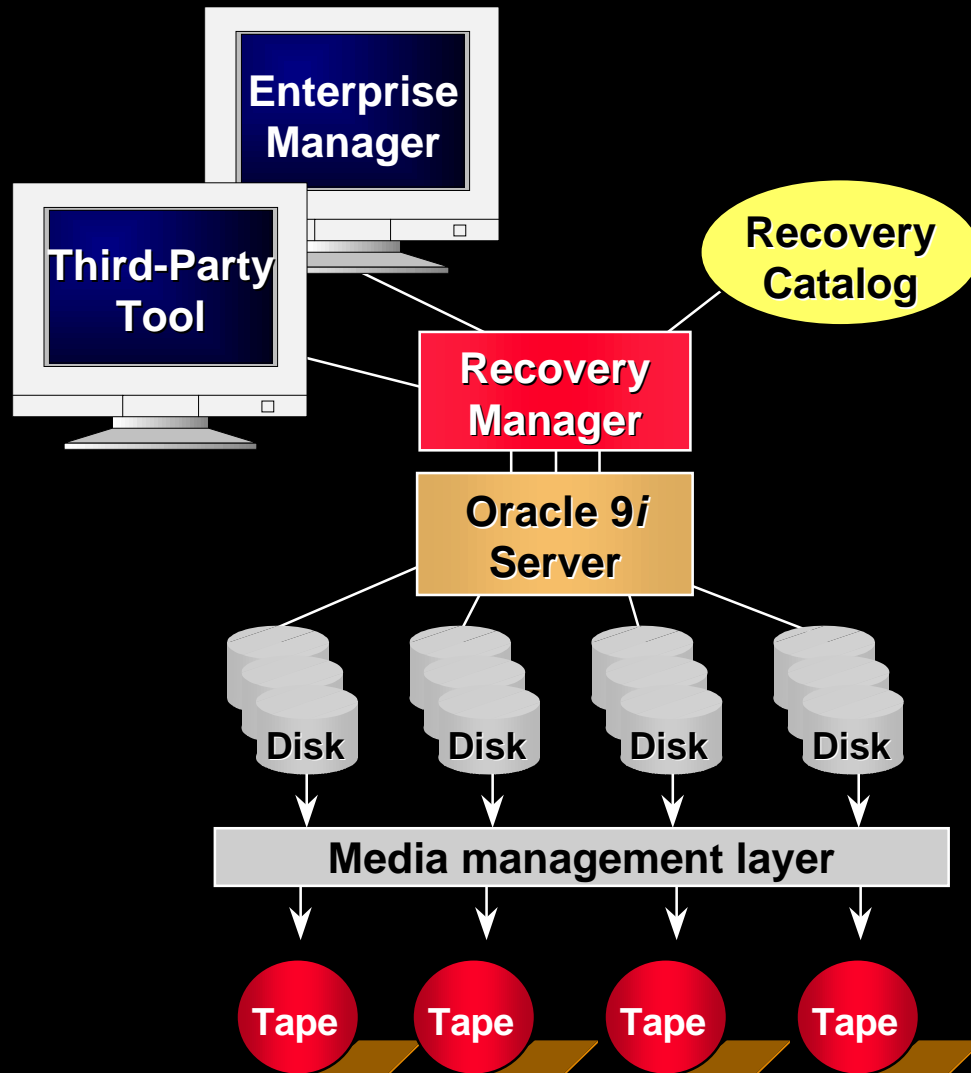
# Recovery Manager



- Stored scripts that automate backup and recovery procedures
- Backups can be restricted to limit reads per file, per second to avoid interfering with OLTP work
- No generation of extra redo during online database backups
- Proxy Copy Backup Accelerator allows fast copy technology at the storage subsystem level



# Recovery Manager



- Provide a robust database backup solution to our customers by integrating with third-party media management vendors
  - Oracle and the MMV join together our best strengths
  - No need to learn a new interface
  - Member of Oracle's Backup Solutions Program

# TOP 10

## *Reasons to Integrate RMAN into Your Backup and Recovery Solution*

10 EXTENSIVE REPORTING

9 INCREMENTAL BACKUPS

8 BETTER ONLINE BACKUPS

7 RESTORE VALIDATION

6 BACKUP AND RESTORE OPTIMIZATION



# TOP 10

## *Reasons to Integrate RMAN into Your Backup and Recovery Solution*

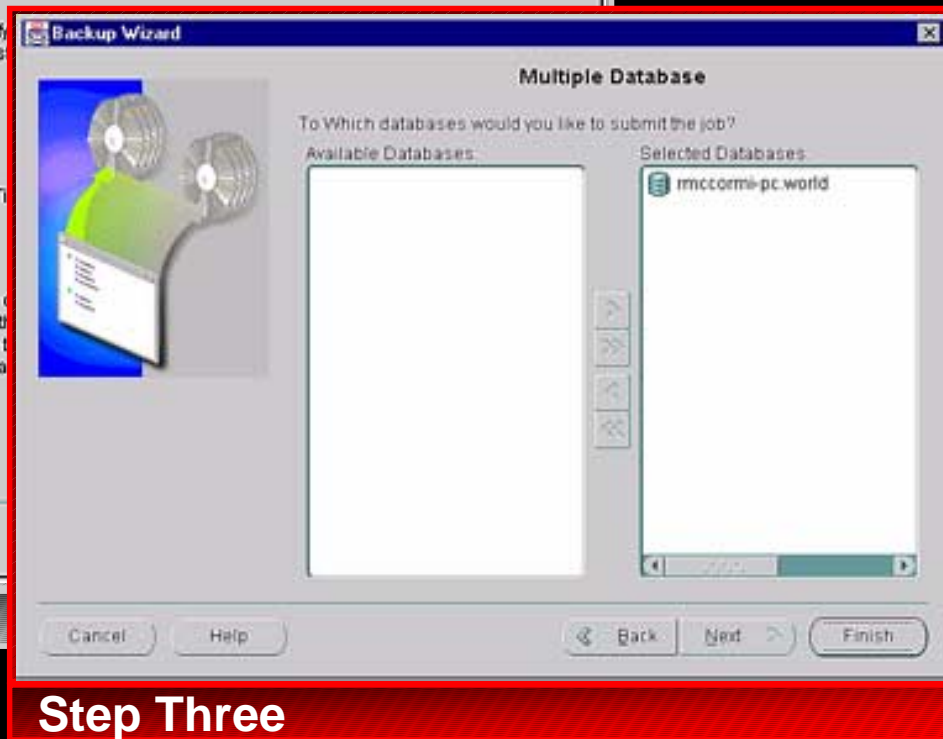
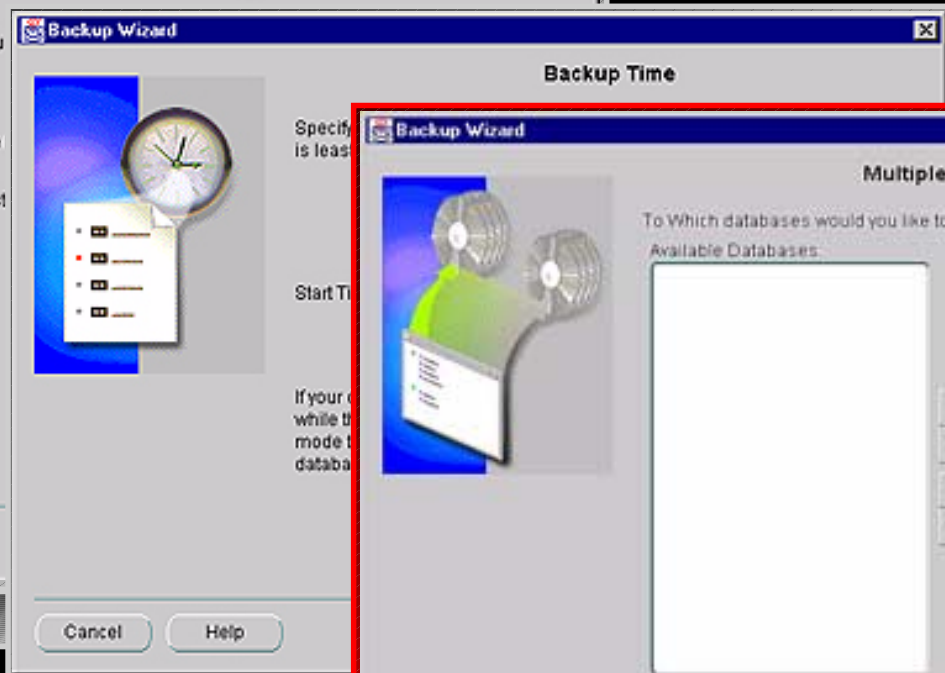
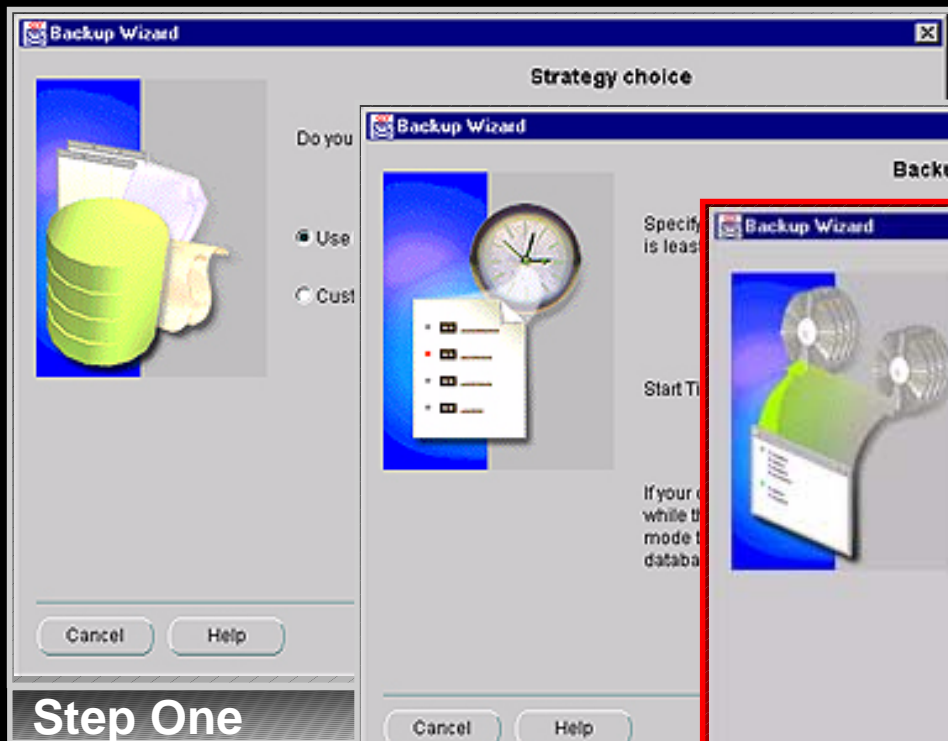
- 5 EASILY INTEGRATED WITH TOP MEDIA MANAGEMENT VENDORS
- 4 BLOCK MEDIA RECOVERY
- 3 RMAN KNOWS ARCHIVELOGS
- 2 CORRUPT BLOCK DETECTION
- 1 DECREASE COMPLEXITY OF BACKUP AND RECOVERY PROCEDURES







# Recovery Manager Enterprise Manager Interface





# Oracle Partner Programs

- Backup Solutions Program (BSP)
- Oracle Storage Compatibility Program (OSCP)

# Oracle Partner Programs - Backup Solutions Program (BSP)

- Facilitate tighter Integration with MMV
- Best of Database
- Best of Media Management Vendors
  - SBT interface - interface to tertiary storage
  - Proxy Copy - server-less backup
  - Provide SDK to certify backup product
  - Enterprise backup solution

# Backup Solutions Program

<http://www.oracle.com/ip/deploy/database/features/recovery/>

## Company

CommVault Systems

Compaq

Computer Associates

EMC

HP

Innovation Data Processing

Knox Software

Legato

Quadratec

SCH Technologies

Sun (Legato OEM)

Syncsort

Tantia Technologies

Tivoli

VERITAS

Verio

## Product

DBVault Magnum

OEM for Legato NetWorker,  
Veritas NetBackup,

Veritas Backup Exec

ARCServ

EMC Data Manager (EDM)

Omniback

FDR/Upstream

Arkeia

Celestra, Networker, BudTool

Time Navigator

dbBRZ

Solstice Backup

Backup Express

Harbor Backup

Tivoli Data Protection

Netbackup, Backup Exec

ASP provider



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# Oracle Storage Programs - Oracle Storage Compatibility Program (OSCP)

- Validate Compatibility of “Specialized” storage solutions with Oracle
  - Oracle over NFS - NAS
  - Remote Mirroring - primarily for log files
  - Snapshot technologies
- Not a certification program
- Process - architecture review, test kit, usage guide, web page of supported configurations

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# A Simple backup scenario

*BnR.com operates a \$2 billion dollar a year e-business selling fishing tackle over the Internet. The Oracle database is hosted on a UNIX platform and requires the database to be available 24/7. BnR.com wants to keep 7 days of backups on disk and then move them to tape . At the end of the month, the tapes are moved to an offsite vaulting facility where they are kept for 3 months.*

# A backup scenario

- 4 Steps to Oracle database backup *and recovery*

Create backup disk area on host; document  
HOST hardware and database; once per month TEST  
recovery procedures

Online backups

Step 3. PROD datafiles, control files, archive logs,  
init.ora, tnsnames.ora, sqlnet.ora

Sunday : Full backup, move SYSDATE-7 to tape

Monday - Saturday : incremental backup

Use RMAN, OEM and OS backup to tape

# Split Mirror Backups

*The **backup database host** is an additional computer in the Recovery environment. On the primary site, the backup host is idle most of the time and used only during the backup window.*

## **Off-Loading Tasks**

*In many mission-critical e-business operations, it is important to have a point-in-time copy of the production database in order to off-load certain tasks. For example, the copy can be used to:*

- *Extract data for a data warehouse*
- *Run reports*
- *Test upgrades*
- *Run database consistency checks*



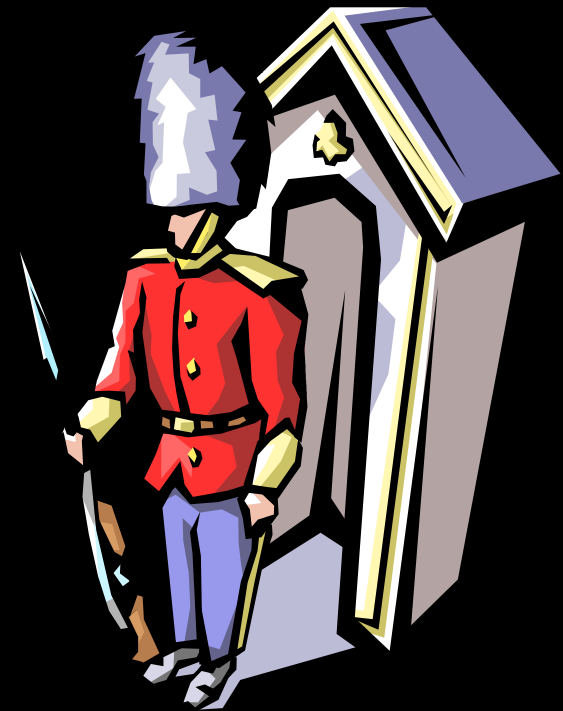


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# How do you protect your data?

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  - Select a backup tool
- Implement Recovery Manager (RMAN)



# Recovery Manager Summary



- Manage operational complexity of backup and recovery
- Make backups proportional to the size of transaction changes, not to the size of database
- Make recovery time proportional to the amount of data recovered
- Minimize the possibility of human errors

# Useful URLs

- Oracle high availability and storage management white papers
  - <http://otn.oracle.com/deploy/availability/>
- Oracle Backup Solution Program (BSP)
  - <http://www.oracle.com/ip/deploy/database/features/recovery/>
- Oracle Storage Compatibility Program (OSCP)
  - <http://www.oracle.com/ip/deploy/database/storage/>

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Q U E S T I O N S  
A N S W E R S

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