MySQL Backup for the Oracle DBA

Chander Kant Zmanda, Inc.
ck@zmanda.com
https://www.zmanda.com/

Agenda

- Zmanda Inc Overview
- ZRM for MySQL
- RMAN/Oracle vs. ZRM/MySQL
- Quickstart
- Backup Methods
- Backups using Snapshots
- Point in Time Recovery of Database
- Reporting and Monitoring
- Advanced Features
- Q & A

Zmanda : Open Source Backup and Recovery

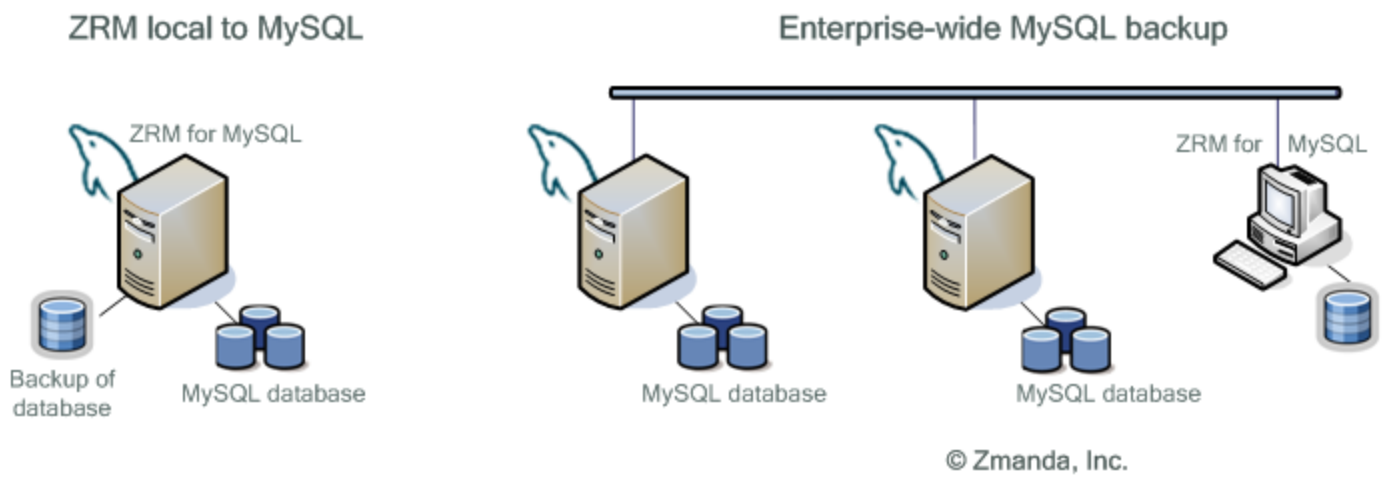
Overview: Market leader in open source backup and recovery
Amanda: Network Backup
Zmanda Recovery Manager for MySQL

Business Model: Annual subscription fee model as pioneered by open source leaders MySQL and Red Hat

Adoption: 500,000+ servers protected by Zmanda

Zmanda and MySQL :

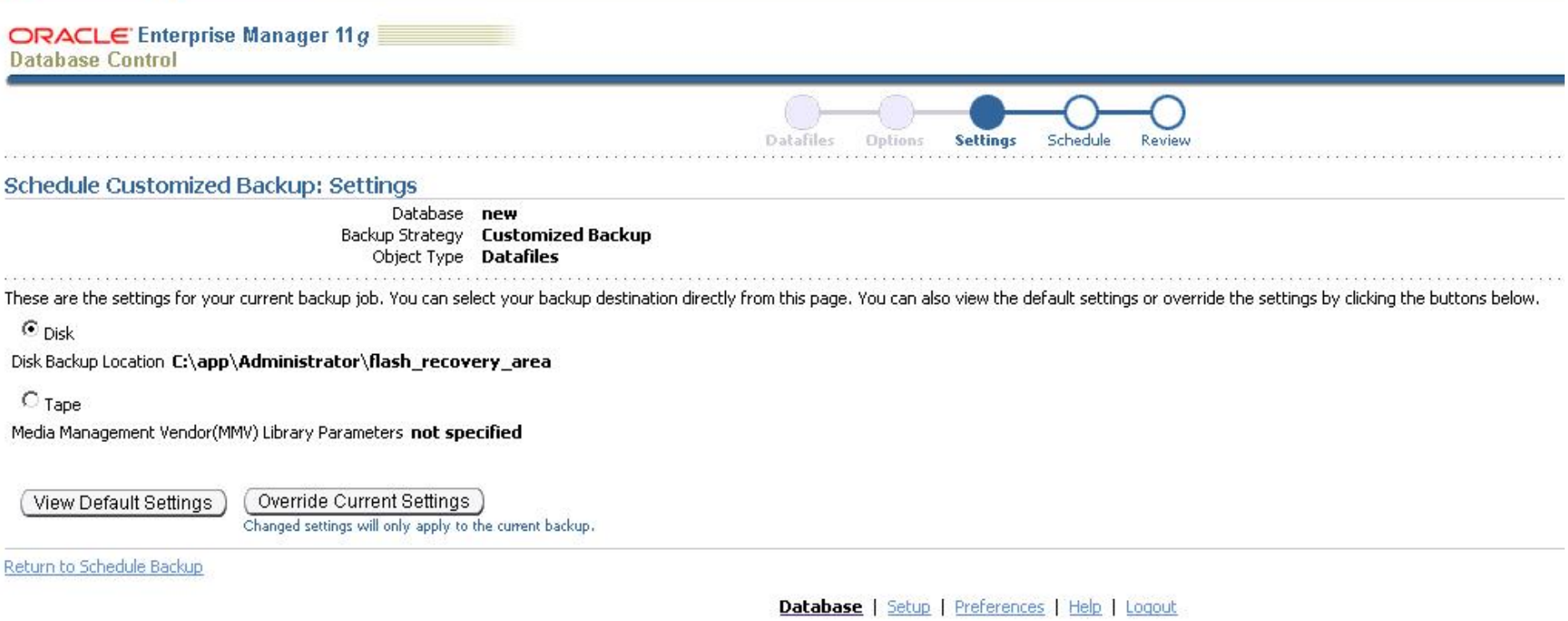
Zmanda Recovery Manager (ZRM) for MySQL



- Centralized backup and recovery of multiple MySQL databases
- Schedule full and incremental backups
- Perform logical or raw backups of MySQL database
- Get e-mail or RSS notification about status of backups
- Monitoring and Reporting
- Enforcement of site or application specific backup policies
- Recover database easily to a required point in time or to any particular database event

Oracle RMAN

- Backup/Restore Scripts and Backup Manager in Oracle Enterprise Manager
- Block level corruption detection
- Block level differential backup
- Recovery information integrated into the database control files



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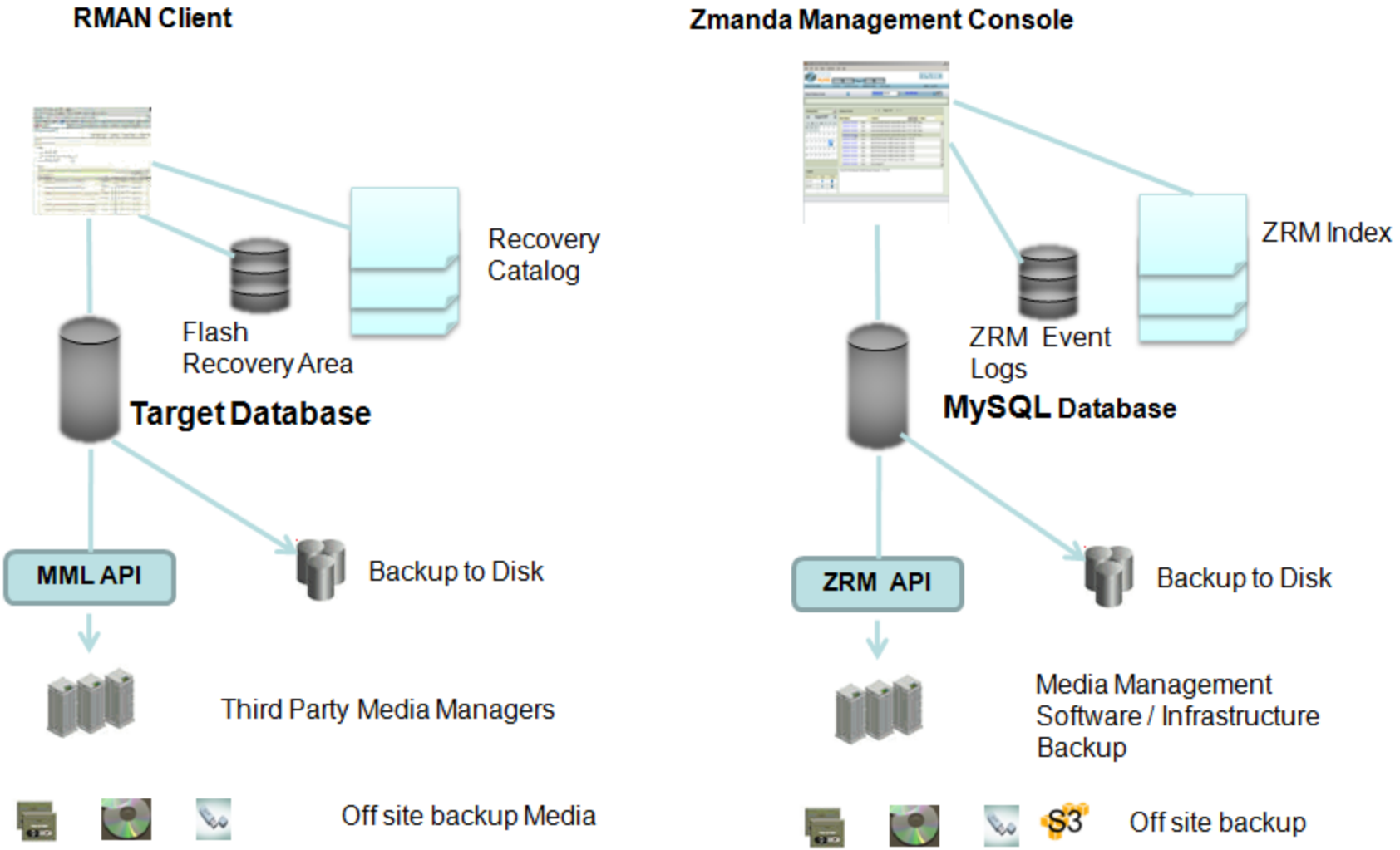
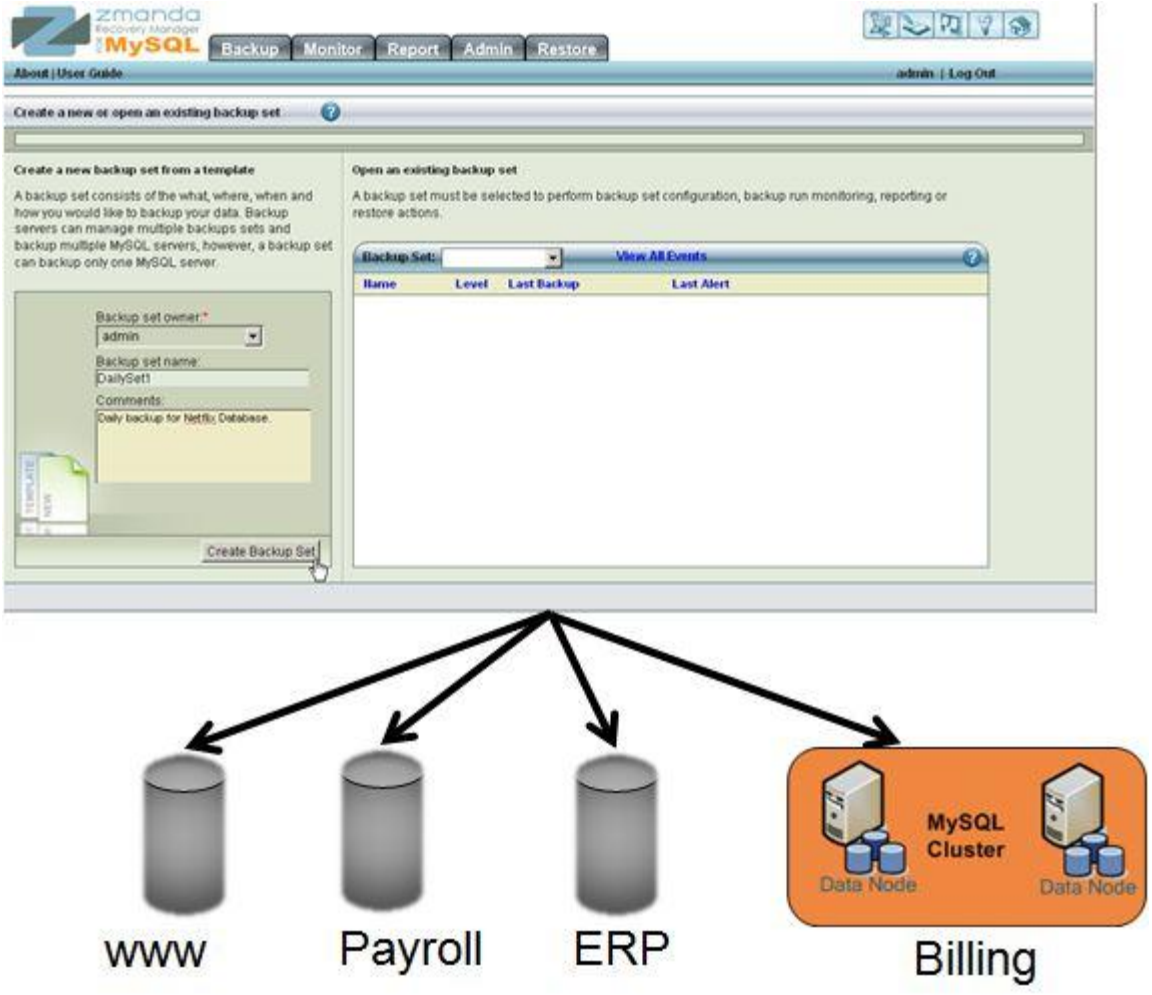
RMAN and ZRM for MySQL



ZRM for MySQL – Global Management for Online Databases



Backup of Enterprise wide MySQL Databases

Quick Start – Default Configuration

- RMAN/Oracle

  $ORACLE_HOME/config/scripts/backup.sh

  – Runs full backup of all databases under ORACLE_HOME

  – Default retention policy is last two backups

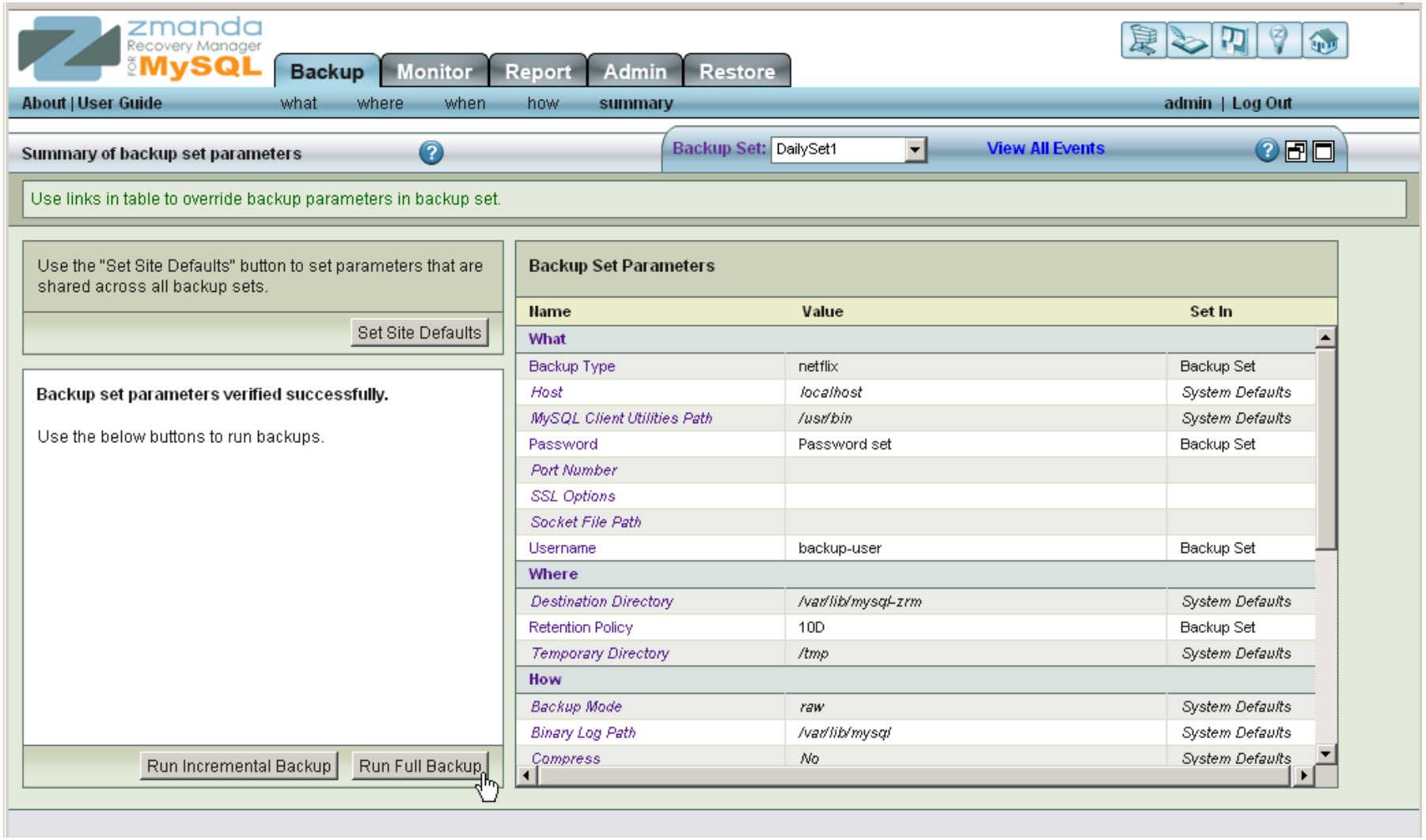
- ZRM/MySQL

  /usr/bin/mysql-zrm-backup

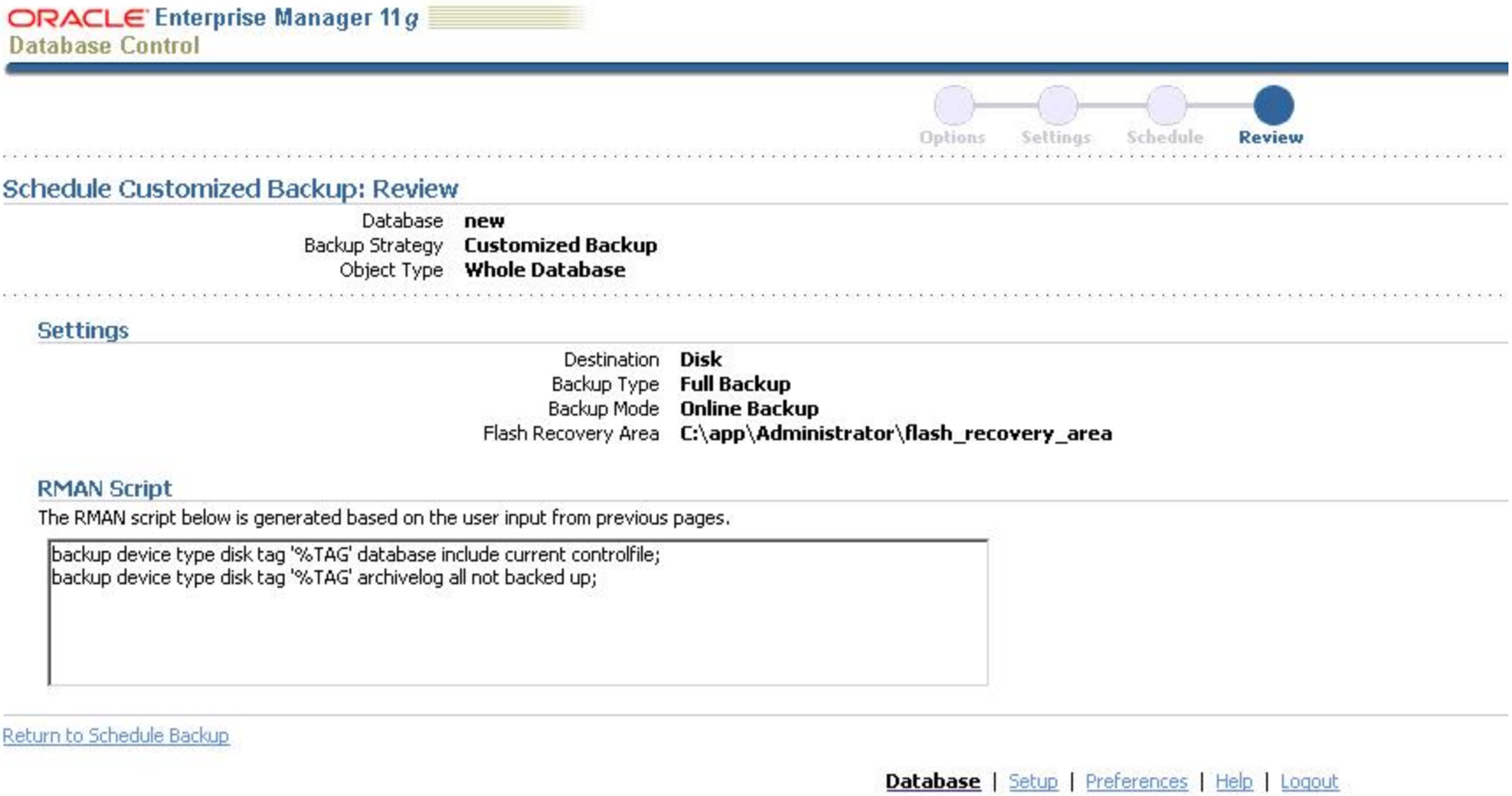
  – Runs full backup of all local databases

  – Default retention policy is forever

Immediate Full Backup from Management Console



Immediate Full Backup from RMAN



Logical Backups

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- Extract logical definitions and data from the database to a file
- Can be done at Database level or Table level
- Allows for selective recovery
- Command line and Management Console

Oracle

- EXP (export) and IMP (import) utilities
- Data Pump (Introduced in Oracle 10g)
- Uses Oracle proprietary binary file format

MySQL

- *mysqldump* client program
- Can backup local or remote servers
- Stores backup as SQL statements
- Portable

Physical (Raw) Backups

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- Binary copies of Database files
- Faster and preferred method for large databases
- Very limited portability

Oracle

- Backup Data files, Control files, Server Parameter file and Redo Log files
- Online backup requires ARCHIVELOG mode
- Hot Tablespace Backups (ALTER TABLESPACE BEGIN BACKUP)
- Recovery Manager (RMAN)
- Snapshot: Oracle 11g on Windows has a VSS Writer

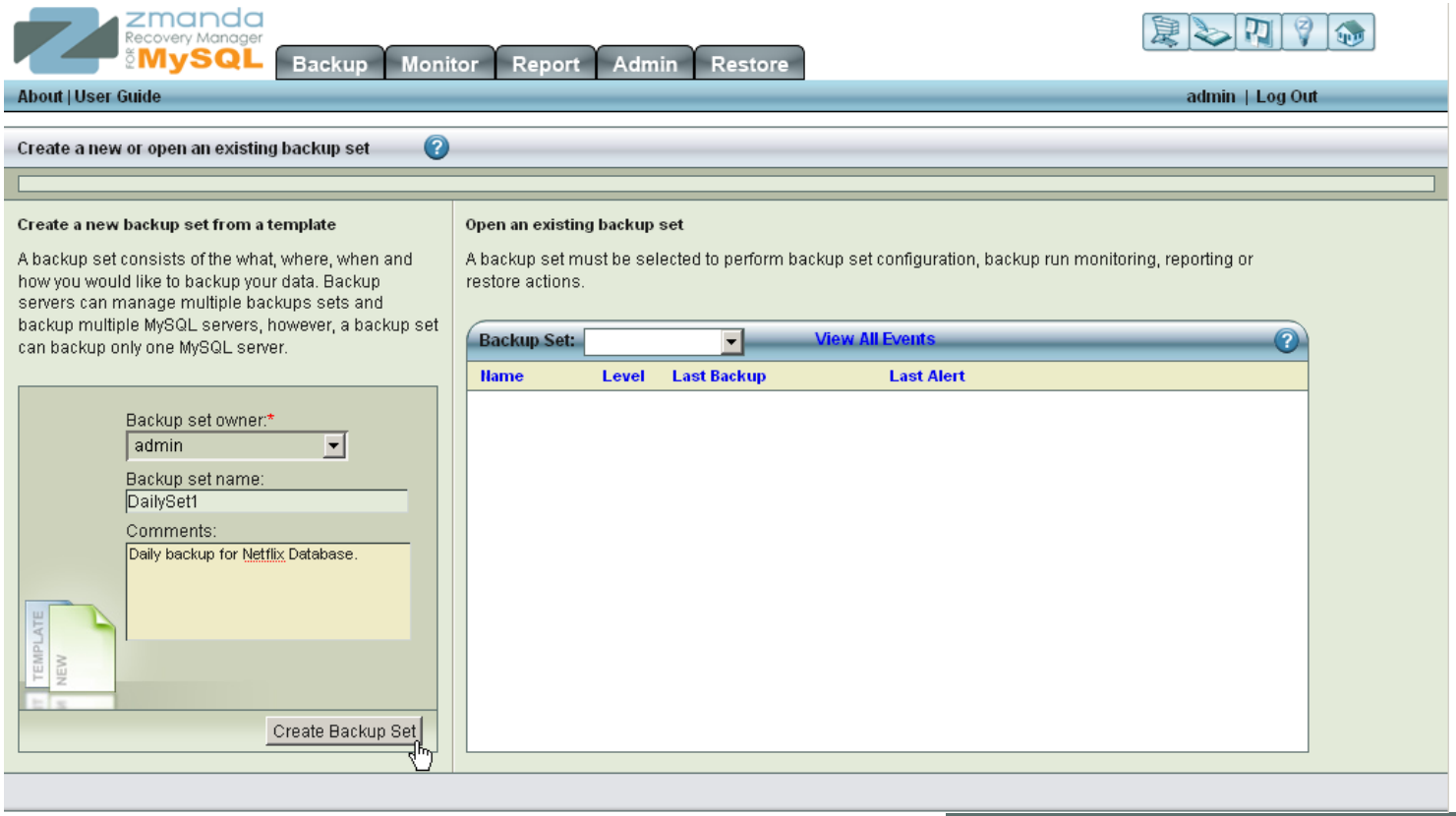
MySQL

- Actual files depend on storage engine being used
  - MyISAM : .frm, .MYD and .MYI files
  - InnoDB: .frm, .ibd, InnoDB log files
- mysqlhotcopy : For MyISAM storage engine on UNIX and Netware
- ibbackup (InnoDB Hot Backup): InnoDB storage engine only
- Snapshot based solutions

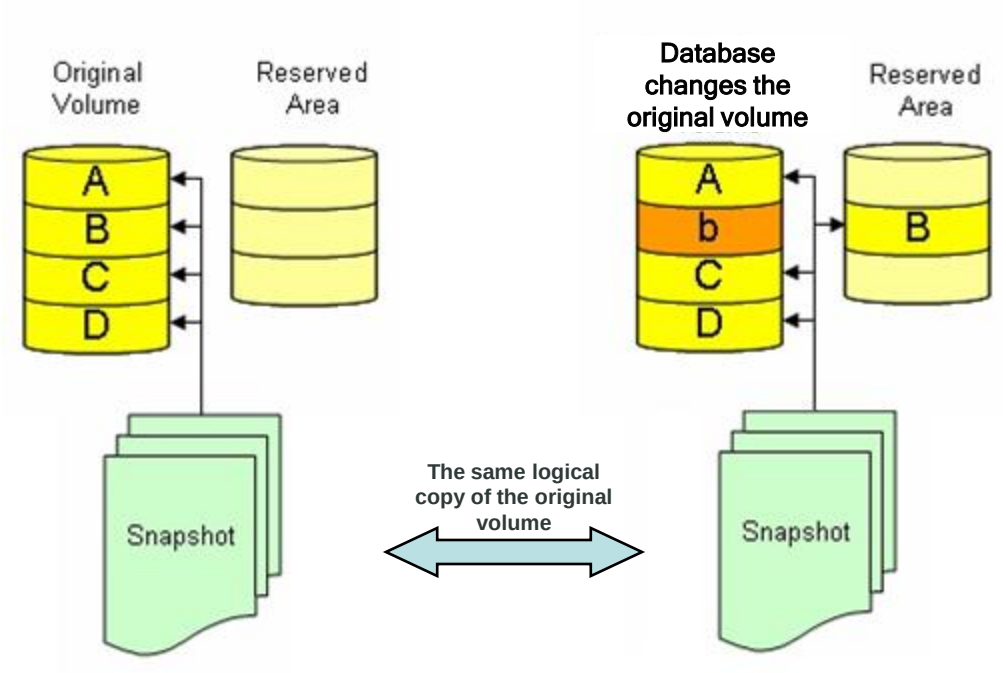
ZRM for MySQL – Optimized for your Configuration

Backup methods that best matches storage engine and configuration

- Logical backup
- Raw backup
- Snapshot backup



Snapshots - Logical Copy Of Database



snapshot is a copy of a set of files and directories as they were at a particular point in the past

- ✓ Copy on Write
- ✓ Taking a snapshot is very fast and does not depend on size of the database
- ✓ Always a “full” point-in-time backup of database

Database Backup Using Snapshot

- Momentarily read lock the database
- Flush the memory buffers for logical consistency of data on disk
- Take the snapshot
- Unlock the database
- Manage the snapshot
  - Moving to a different location
  - Catalog backup images
  - Monitoring and reporting

Requires snapshot manager such as ZRM that is aware of MySQL and specific snapshot technology

Incremental Backups

- Differential and Cumulative backups using RMAN
  - Differential: Faster Backup/Slower Recovery
  - Cumulative: Slower Backup/Faster Recovery

- ZRM only does Differential backups
  - ZMC enables easy recovery

- Differential backups difference
  - Oracle RMAN: Changed blocks
  - ZRM: Database Event Log

Storing backups

- Encryption
- Compression
- RMAN media management interface
- ZRM for MySQL integration with Amanda Enterprise
- Storing backups on the storage grid
  - Amazon S3

Point in Time Restore of Databases

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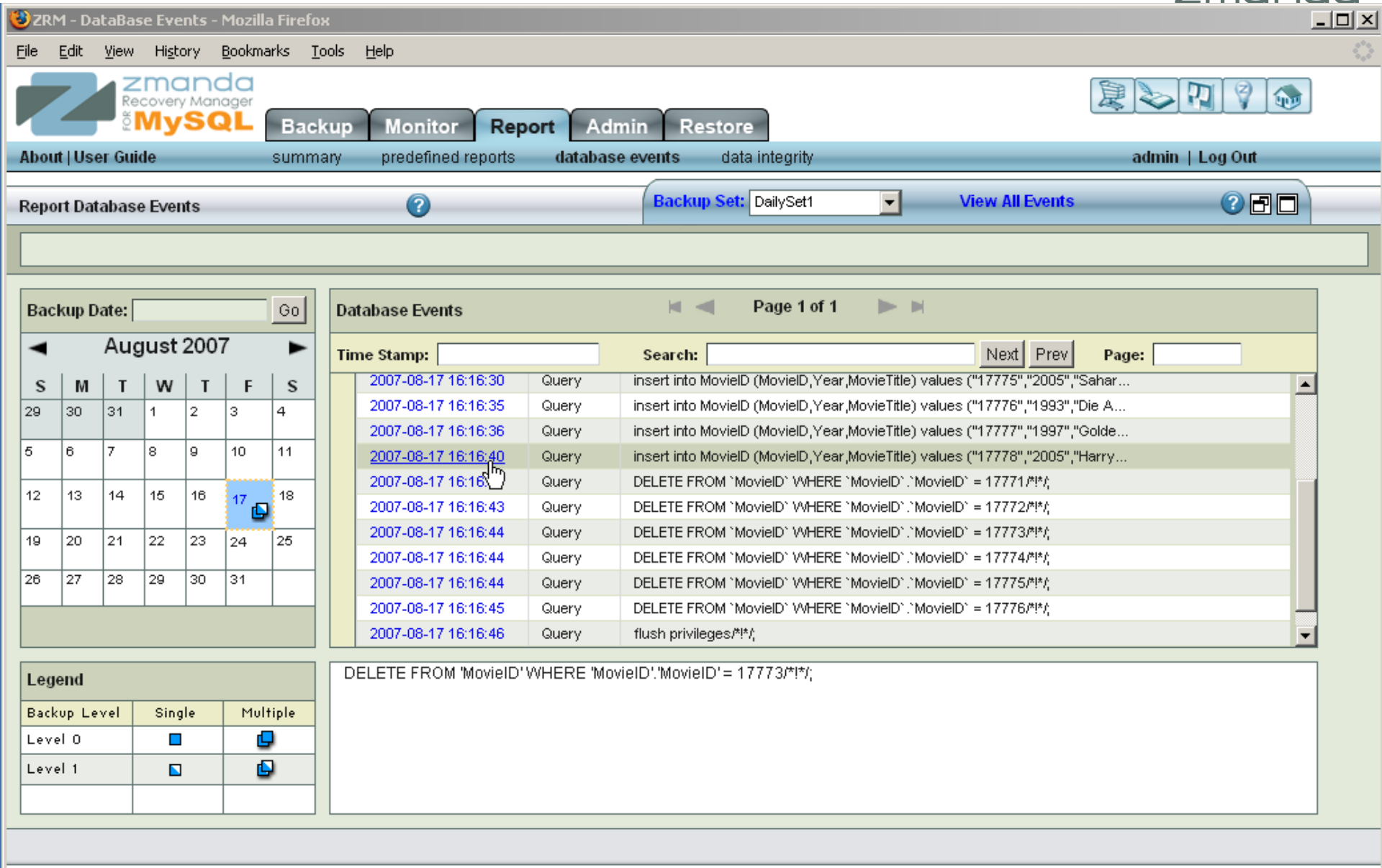
- Recovering from logical errors
- Audit and analyze transactions

- Oracle Flashback Commands
  - RMAN Flashback Transaction History
- MySQL Log Analyzer pin-points the time of recovery
  - ZRM can recover to any point in time since last backup

MySQL Log Analyzer



MySQL Backup Reporting

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Select a predefined report:

Backup Report

Customize report

- [x] Backup Date & Time
- [ ] Backup Directory
- [x] Backup Size
- [ ] Backup Size (Compressed)
- [ ] Binary Logs
- [ ] Comment
- [ ] Compression
- [ ] Compression/Encryption Time
- [x] Databases
- [ ] Databases (Logical)
- [ ] Databases (Raw)
- [x] Databases (Snapshot)
- [ ] Encryption
- [ ] Flush Logs time
- [ ] Host
- [ ] InnoDB Data Files
- [ ] InnoDB Logs

View Customized Report

Backup Report for Movies

Backup Date & Time	Backup Size	Databases	Databases (Snapshot)	Level	MySQL Version	Read Locks Time	Status	Time Taken
2007-12-05 16:23:44	346.63 GB	movies	movies	0	5.0.50-enterprise-gpl-log	00:00:00	Backup succeeded	03:35:31
2007-12-05 16:22:46	517.04 MB	moviesinnodb	moviesinnodb	0	5.0.50-enterprise-gpl-log	00:00:00	Backup succeeded	00:00:12
2007-12-05 16:22:38	0.00 MB			1	5.0.50-enterprise-gpl-log	00:00:00	Backup succeeded	00:00:00
2007-12-05 16:16:54				0	5.0.50-enterprise-gpl-log	00:00:00	Backup failed	00:00:00
2007-12-04 23:05:31		movies	movies	0	5.0.50-enterprise-gpl	00:00:00	Backup failed	00:00:00
2007-12-04 23:04:42	517.04 MB	moviesinnodb	moviesinnodb	0	5.0.50-enterprise-gpl	00:00:00	Backup succeeded	00:00:15
2007-12-04 23:02:27	146.37 MB	moviesinnodb		0	5.0.50-enterprise-gpl	00:00:12	Backup done but with errors	00:00:13
2007-12-04 22:47:43	146.37 MB	moviesinnodb		0	5.0.50-enterprise-gpl	00:00:13	Backup done but with errors	00:00:15

Advanced Features

- Database Duplication
  - RMAN Network Database Duplication
  - ZRM can instantiate MySQL Replication Slaves
- Access control
  - RMAN Virtual Private Catalog
  - ZRM Role Based Access Control
- Cluster support
  - RMAN supports Real Application Cluster (RAC)
  - ZRM supports MySQL NDB Clusters

ZRM/MySQL == RMAN/Oracle

- Multiple Backup methods to suit multiple storage engines
- Plug-in Architecture
  - Snapshots
  - Scheduling
- Customizable compression and encryption methods
- Flexible, robust and very easy to use

Top 5 Considerations while setting up your MySQL Backup
https://www.zmanda.com/mysql-backup-considerations.html

Live Demo: https://network.zmanda.com/