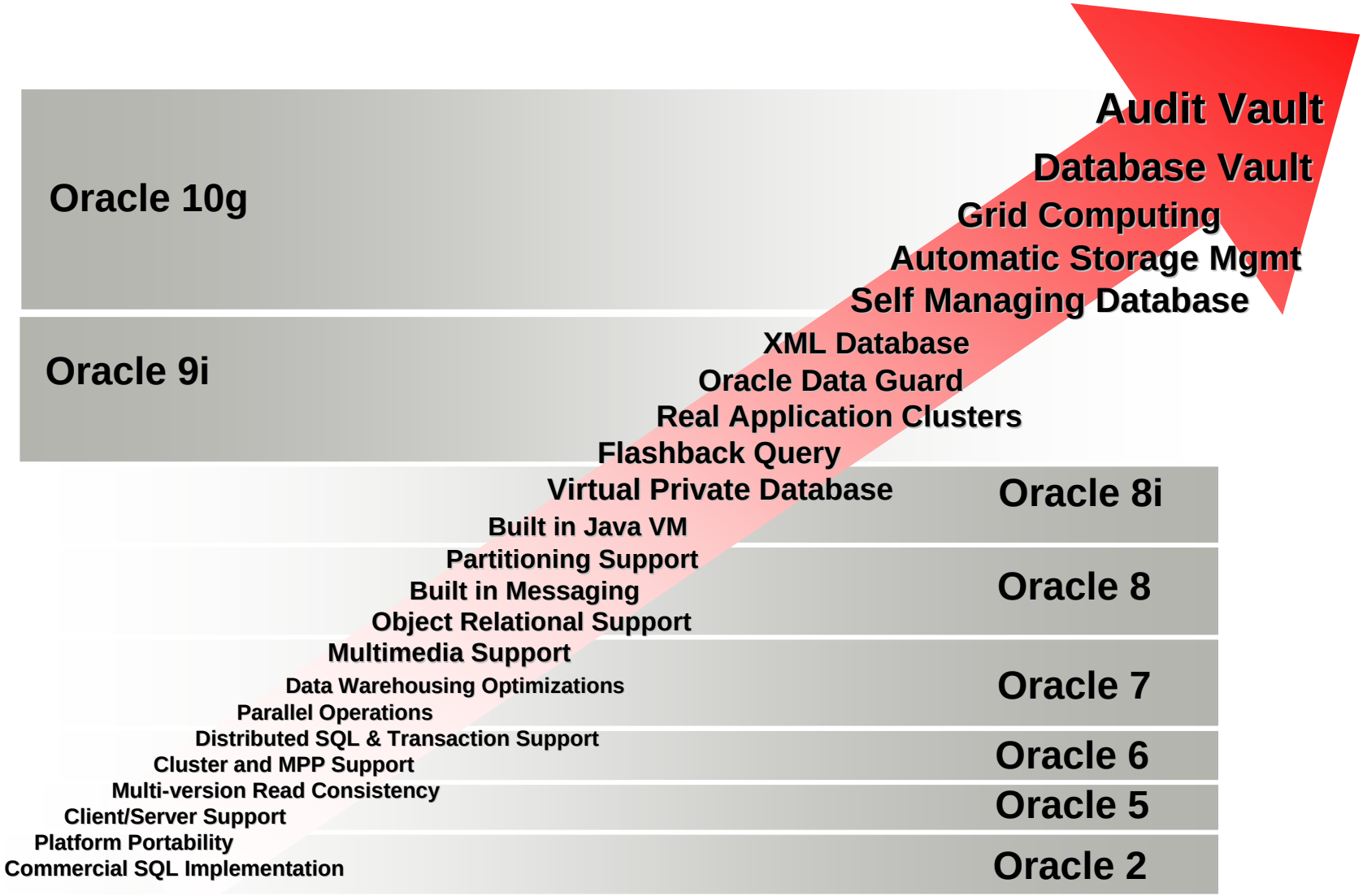
ORACLE®

DATABASE 11g

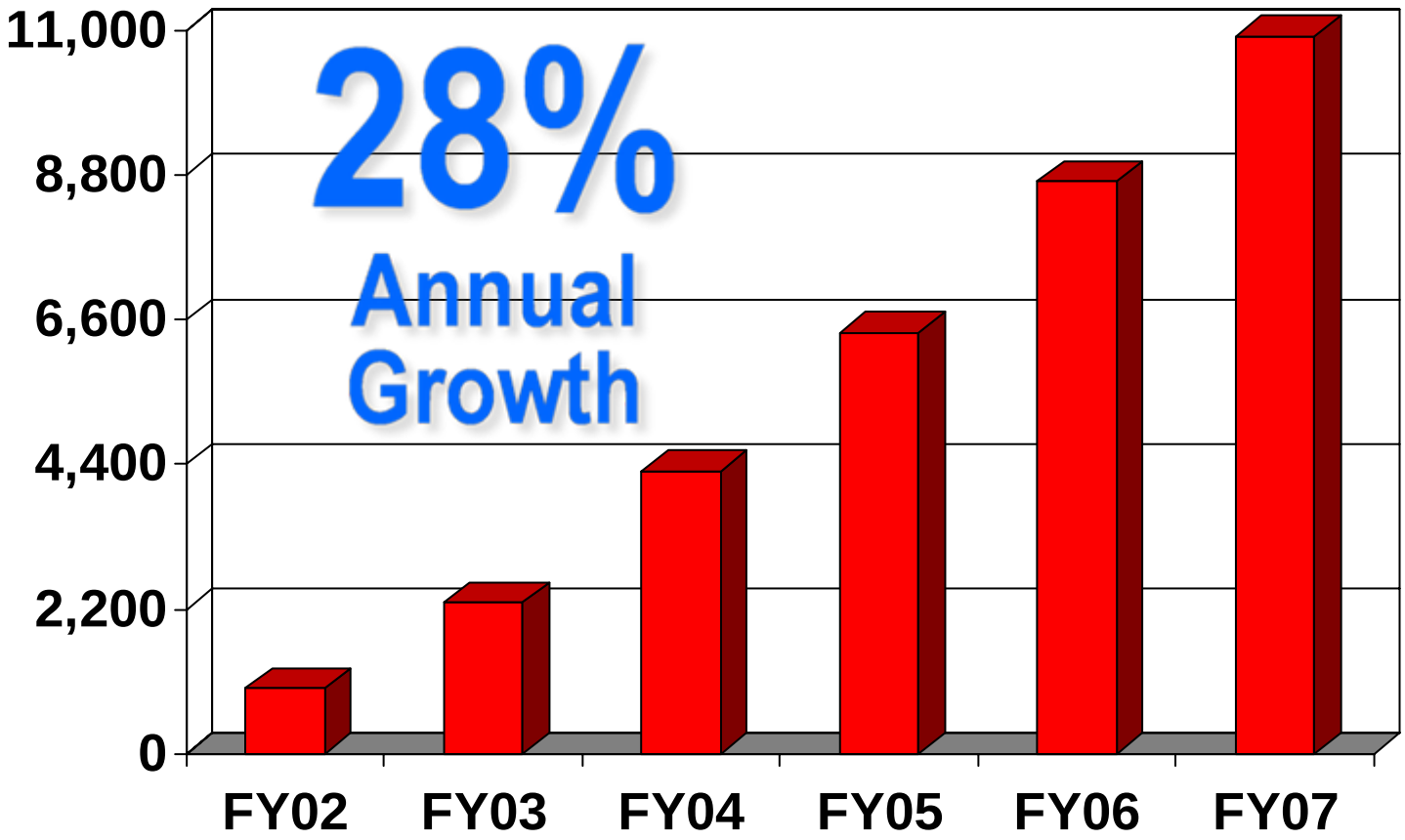
Continuous Innovation



Oracle: The Database Market Leader

- Overall database market share leader
- 275,000 customers
- Leader OLTP
- Leader Data Warehousing
- Leader on Linux
- Leader on UNIX
- Leader TPC-C OLTP Performance
- Leader TPC-H DW Performance
- Leader Price/Performance

Oracle RAC Adoption Growth



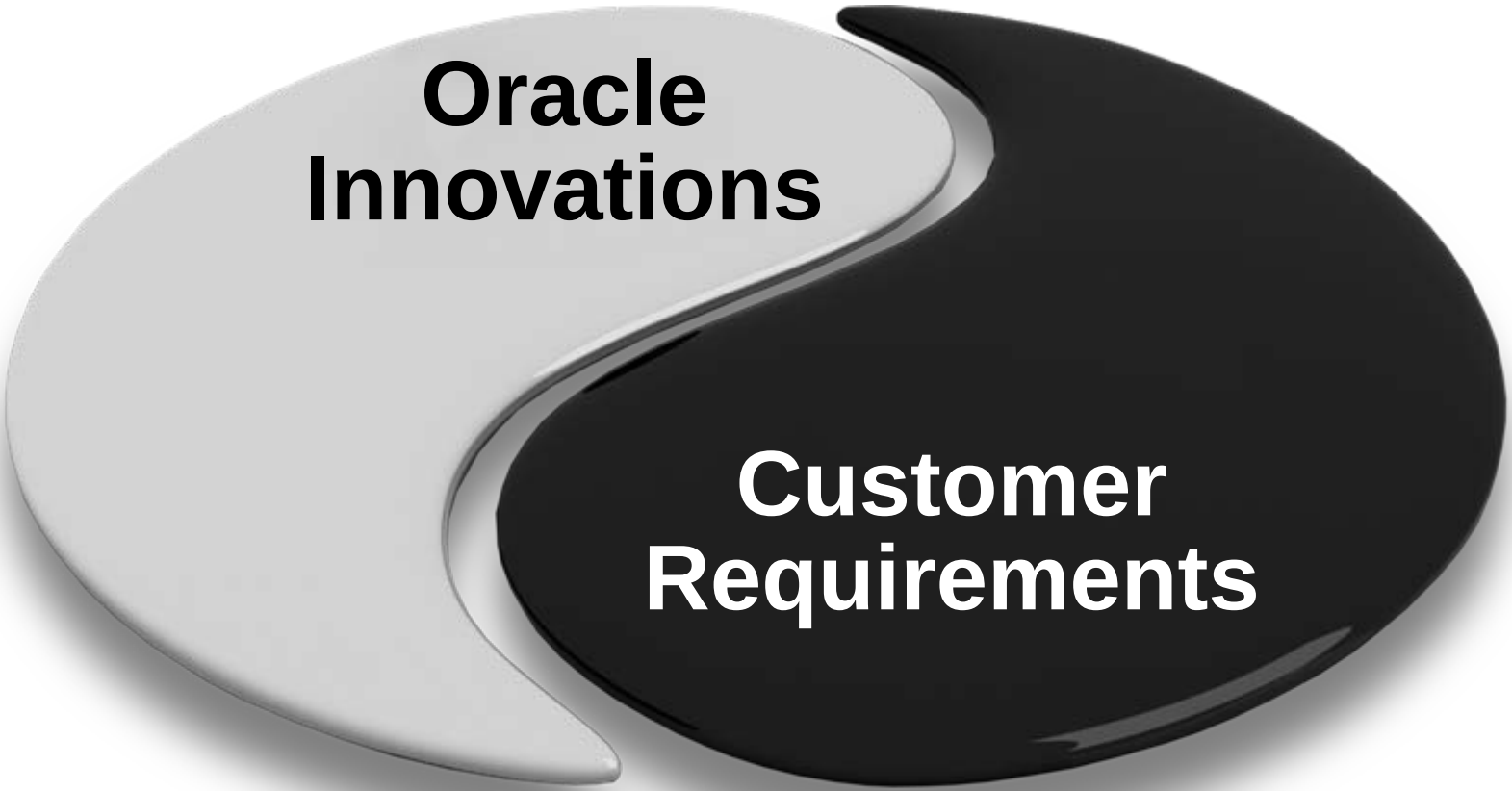
Innovation Challenges

- Information is Changing
- More Consumers of Information
- Real-time Access Required
- Increasing Security and Compliance Requirements
- Higher Quality of Service at Lower Cost
- Pressure to Manage Increasing Rate of Change


ORACLE®
DATABASE
11g

Oracle Database 11g Highest Quality R&D

- Over 1500 developers and testers spread across eight development labs around the world
- 479 Development Projects
- Over 235,000 functional tests run daily on a grid of over 2000 processors
- Triple the number of cross-functional tests run versus Oracle Database 10g
- Over 15,000,000 hours of testing
- Exhaustive battery of security tests


Oracle
Innovations
Customer
Requirements

Oracle Runs the Largest Databases

Meteorological Research

- 220+ Terabyte Oracle database
- World's largest database on Linux

Website Personalization

- 500,000,000 unique users
- 200 Terabyte Data Warehouse

The Best of the Web Use Oracle

Online Retail Pioneer

- One of the largest data warehouses in the world
- Based on Oracle Grid

Leading Online Career Network

- Multi-terabyte data warehouse for marketing
- Based on Oracle Grid

America's #1 Relationship Service

- More than 15,000,000 Registered Users
- Moved to Oracle Grid

Large Social Networking Site

- 31,000,000+ Users
- Runs on Oracle Grid

Predicts Future Prices of Airline Tickets

- Analyzes 150 billion airline quotes
- Moved to Oracle Grid

Database Customer Advisory Boards

- Security and Compliance
- Manageability and Diagnostics
- Performance and Scaleability
- High Availability

420 user groups representing
225,000 members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DATABASE
11g

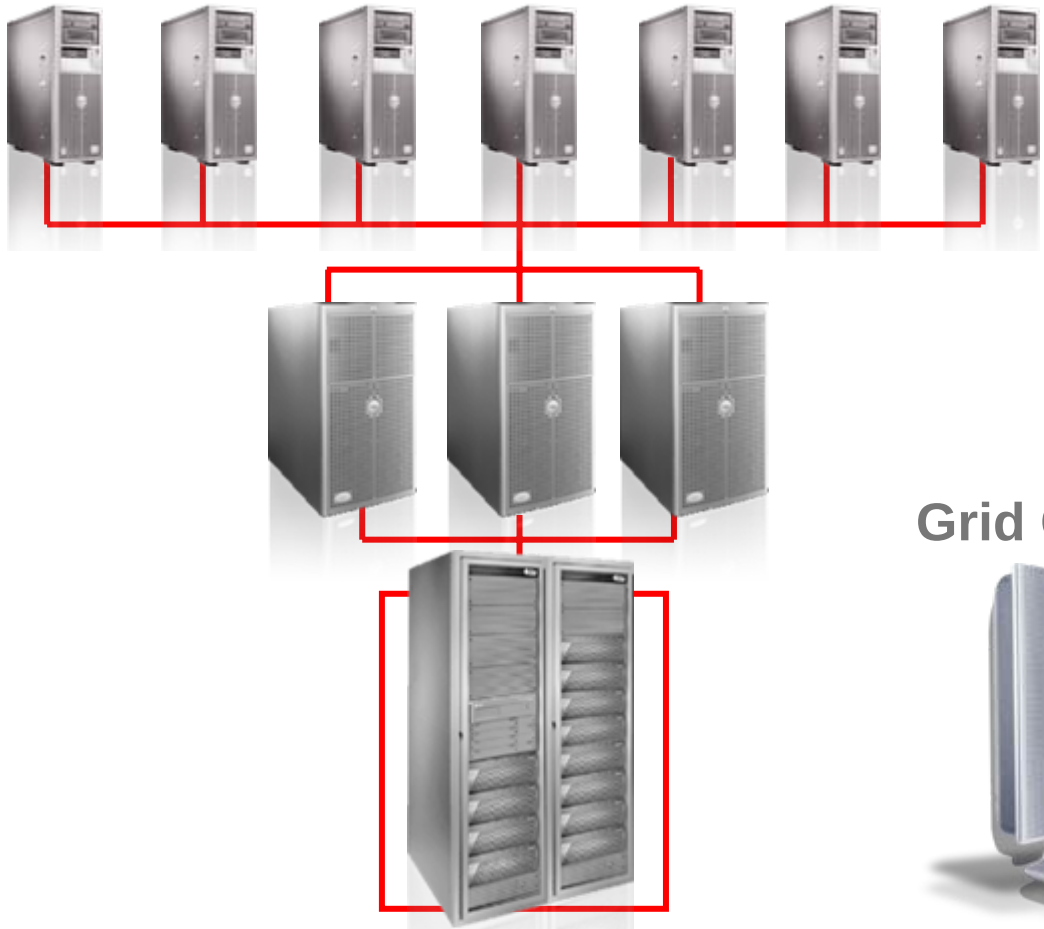
Growing the Grid

Grid Computing

Fusion Middleware

Real Application Clusters

Automatic Storage Management

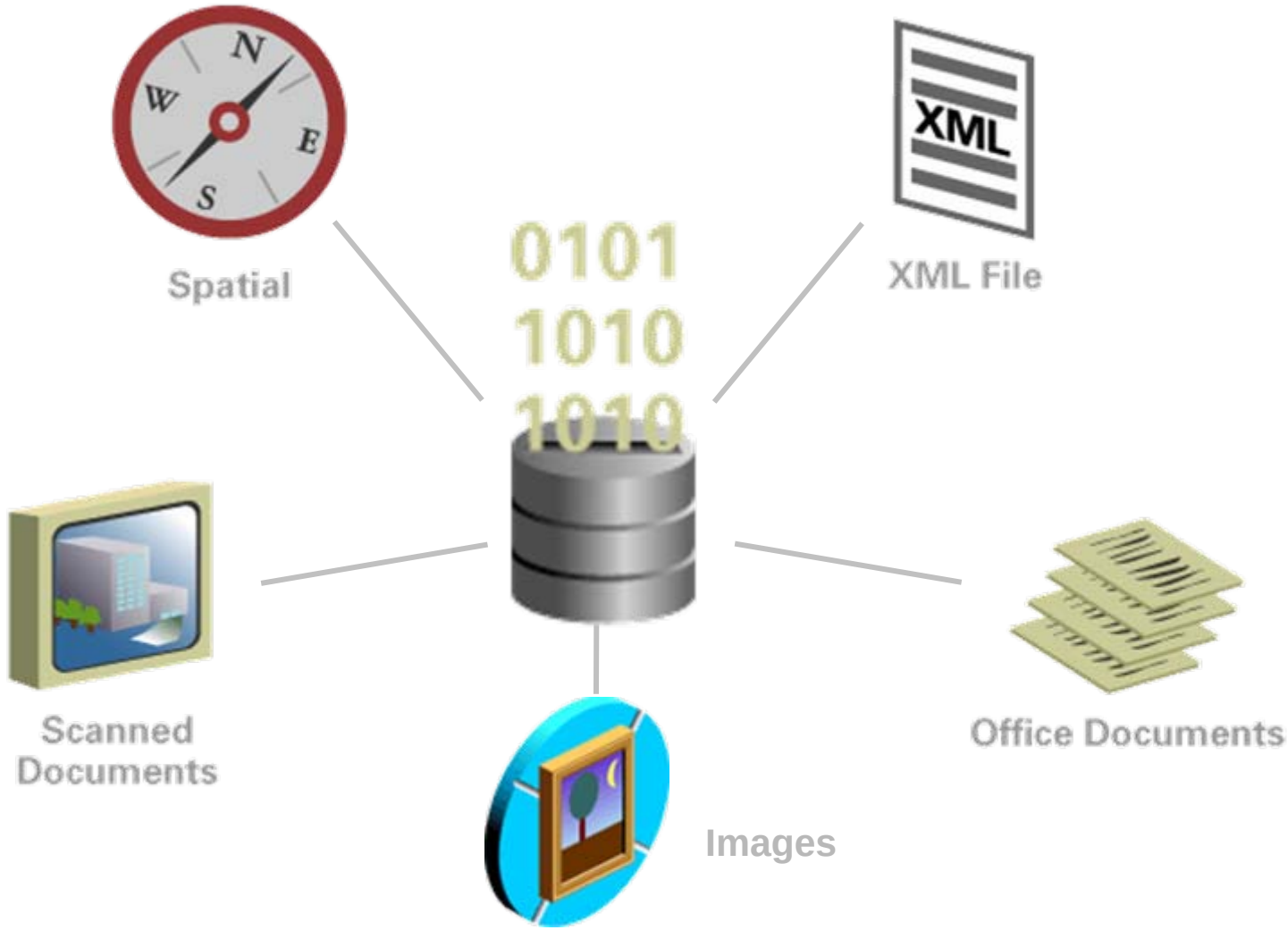


Grid Control

Enabling Innovation with Oracle Database 11g

- Better business insight into all data types
- Managing data growth
- Higher quality of service at lower cost
- Pressure to manage change

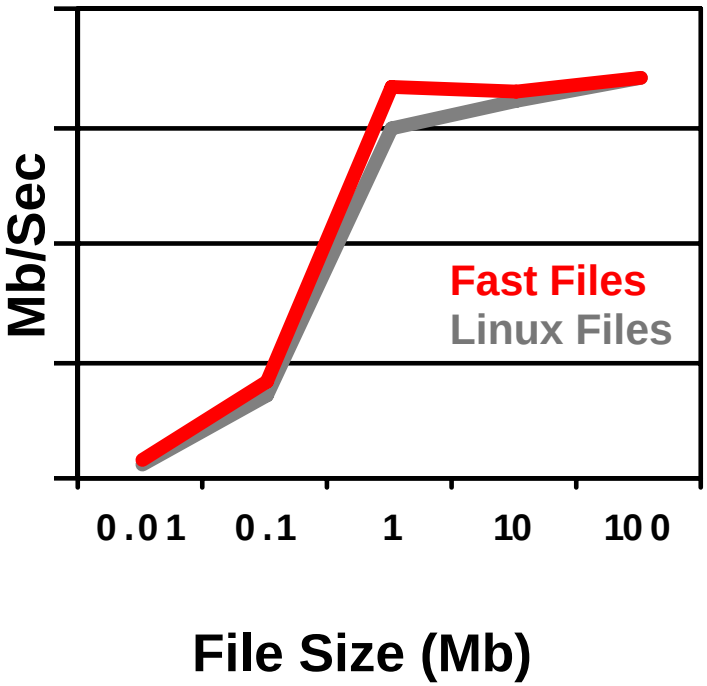
Integrating Unstructured Data



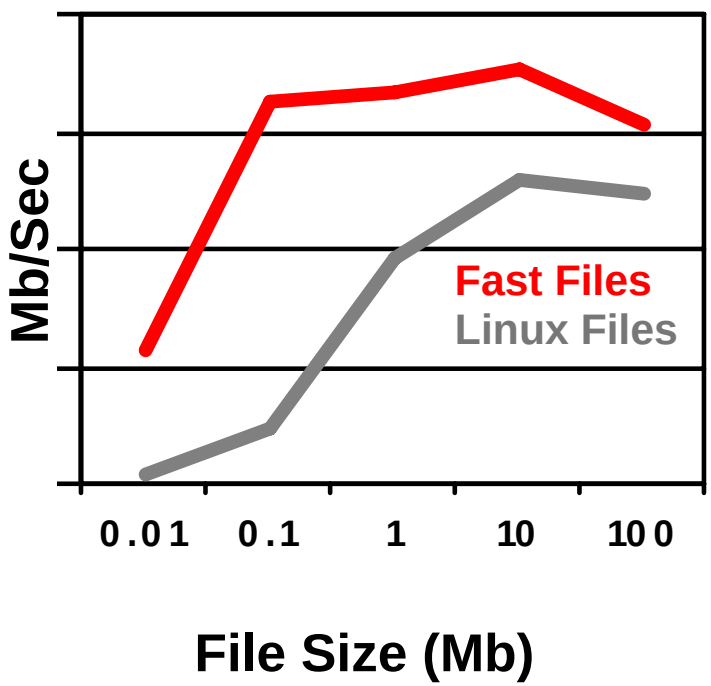
Oracle Fast Files

Breaking the Performance Barrier…

Read Performance

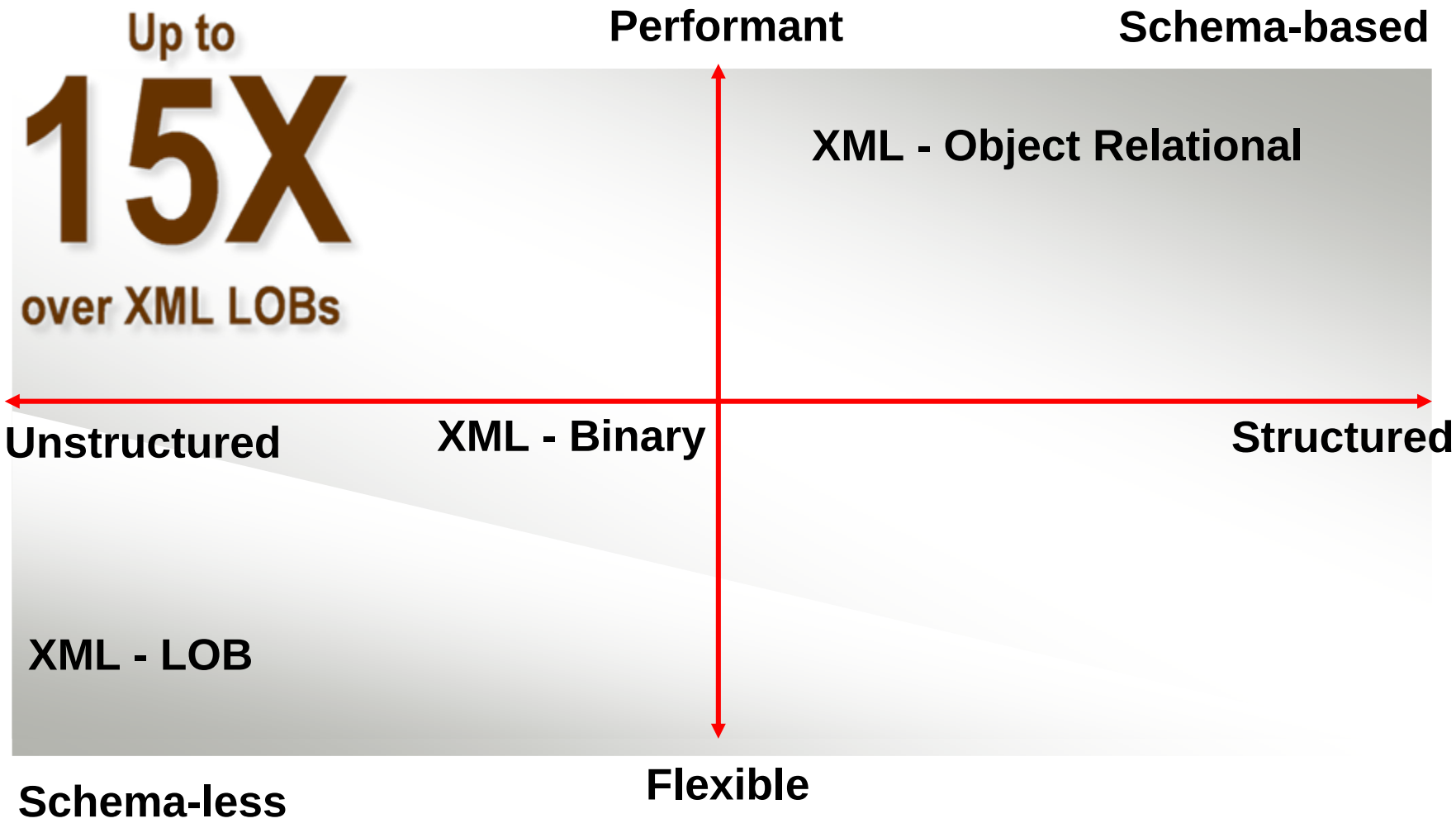


Write Performance



New in Oracle Database 11g

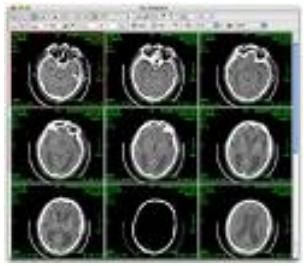
Extended XML Support with Binary XML



New in Oracle Database 11g

Critical New Data Types

RFID Tag Data Types



DICOM Medical Images

3D Spatial Support

Enabling Innovation with Oracle Database 11g

- Better business insight into all data types
- Managing data growth
- Higher quality of service at lower cost
- Pressure to manage increasing rate of change

Managing Data Growth

Unstructured Data

Structured Data

Regulatory Compliance

Business Intelligence

Mergers Acquisitions

Data Consolidation

Data Growth Challenges

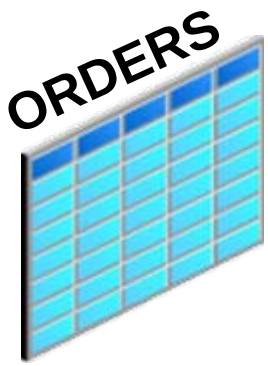
Management Challenge

- Query performance
- Duration of basic data operations
- Availability of data

Cost Challenge

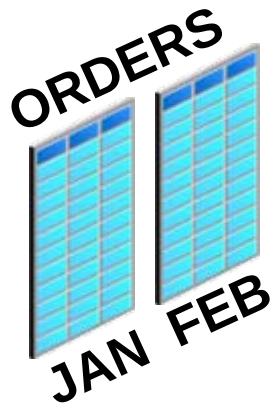
- Volume of storage required
- Overhead to manage
- Cost of of downtime

Benefits of Partitioning



Large Table

Difficult to Manage

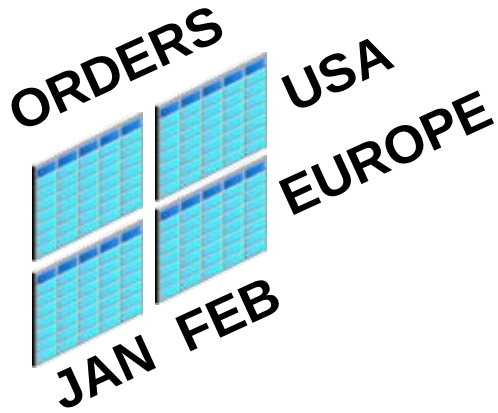


Partition

Divide and Conquer

Easier to Manage

Improve Performance



Composite Partition

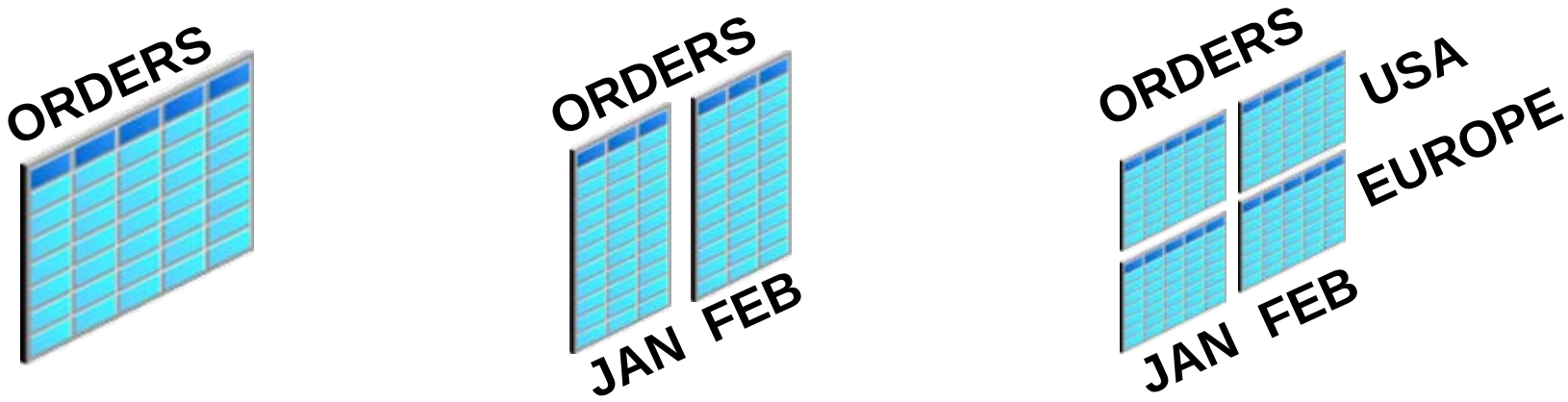
Higher Performance

More flexibility to match business needs

Oracle Customers Have 100,000s of partitions in their databases

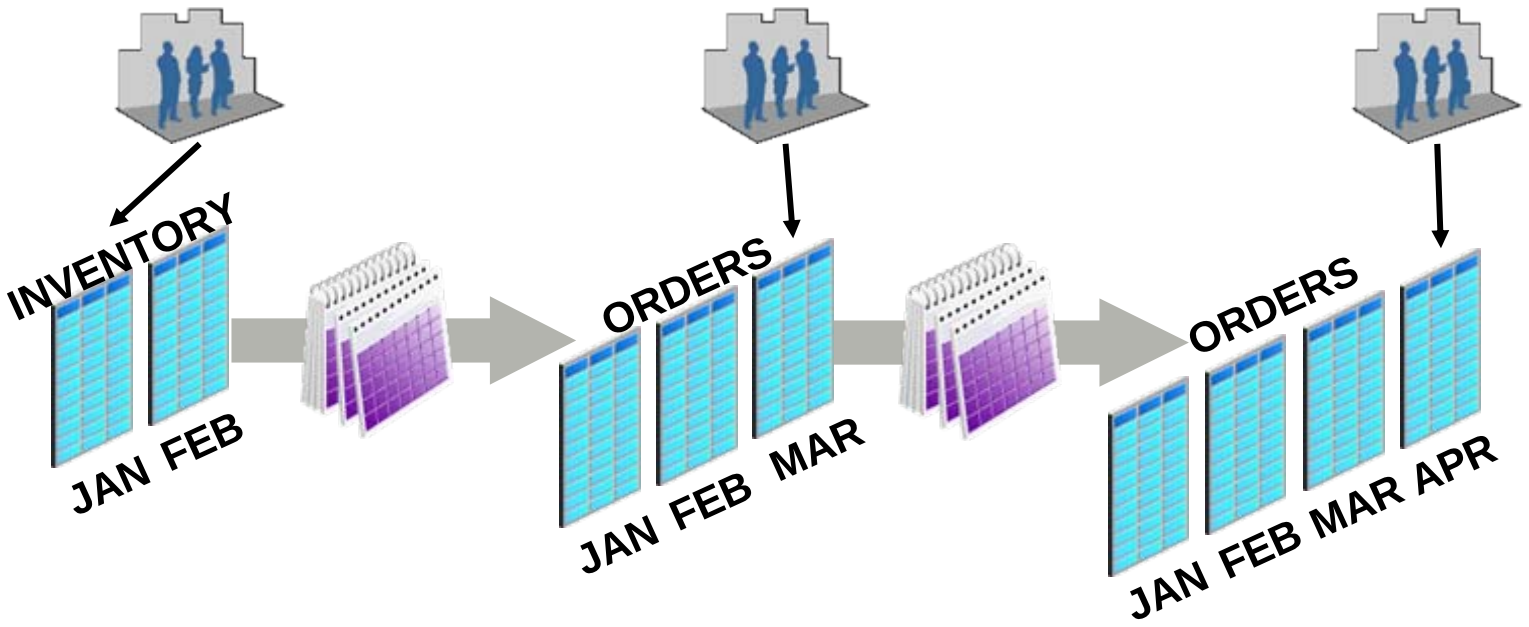
New in Oracle Database 11g

Partition Advisor



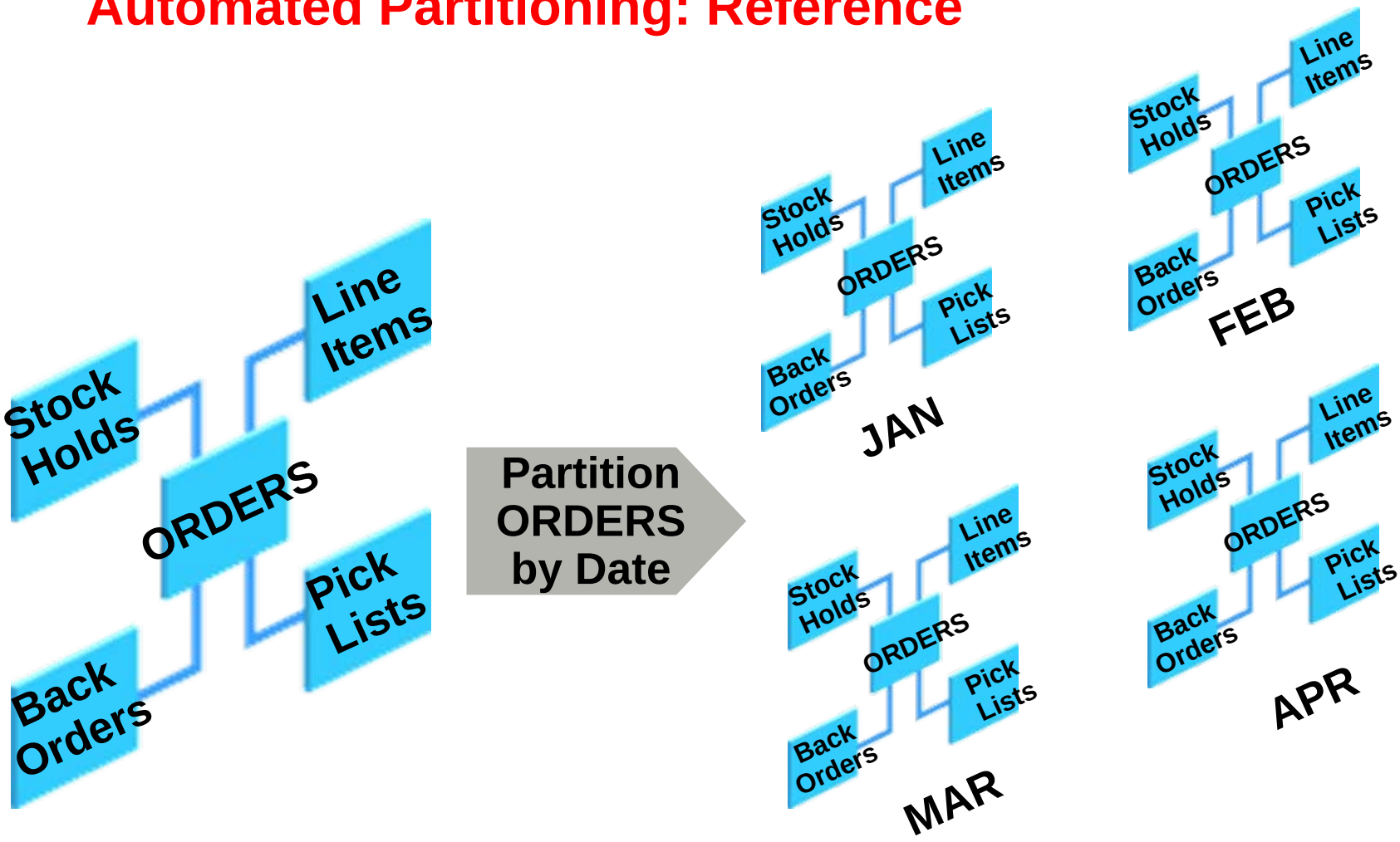
New in Oracle Database 11g

Automated Partitioning: Interval



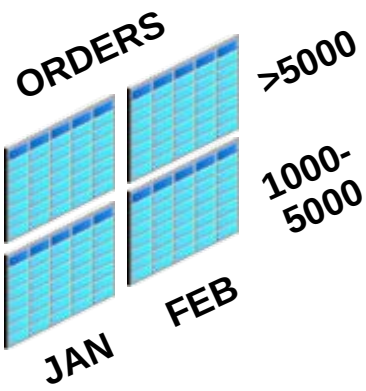
New in Oracle Database 11g

Automated Partitioning: Reference



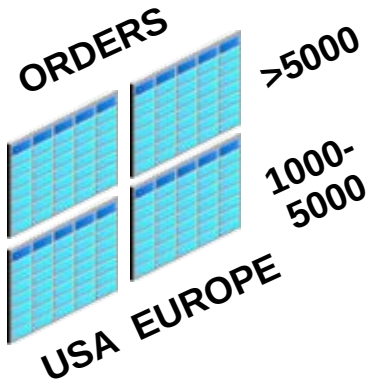
New in Oracle Database 11g

Business Driven Partitioning: New Composite



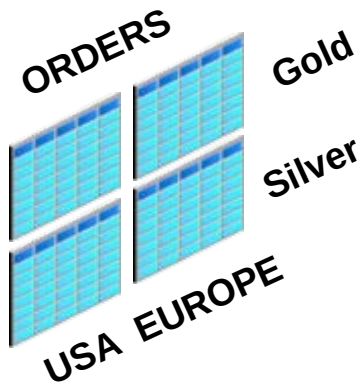
RANGE-RANGE

Order Date by
Order Value



LIST-RANGE

Region by
Order Value



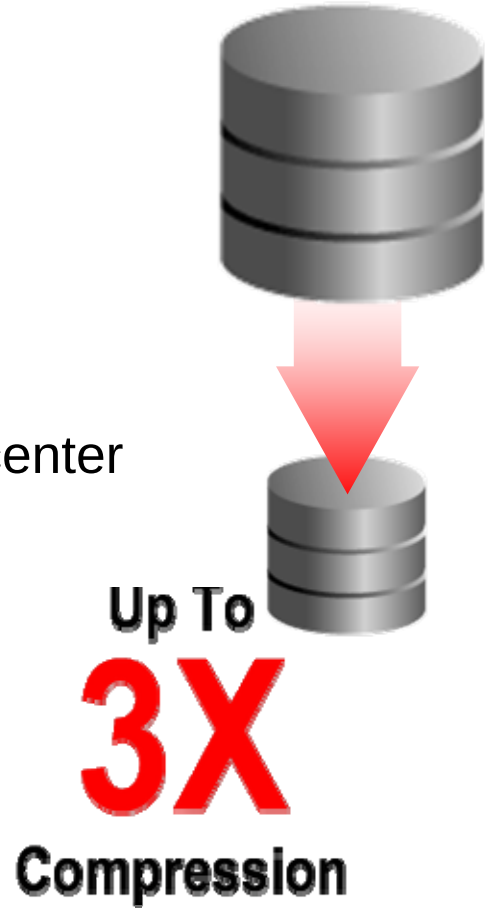
LIST-LIST

Region by
Customer Type

New in Oracle Database 11g

Advanced Compression

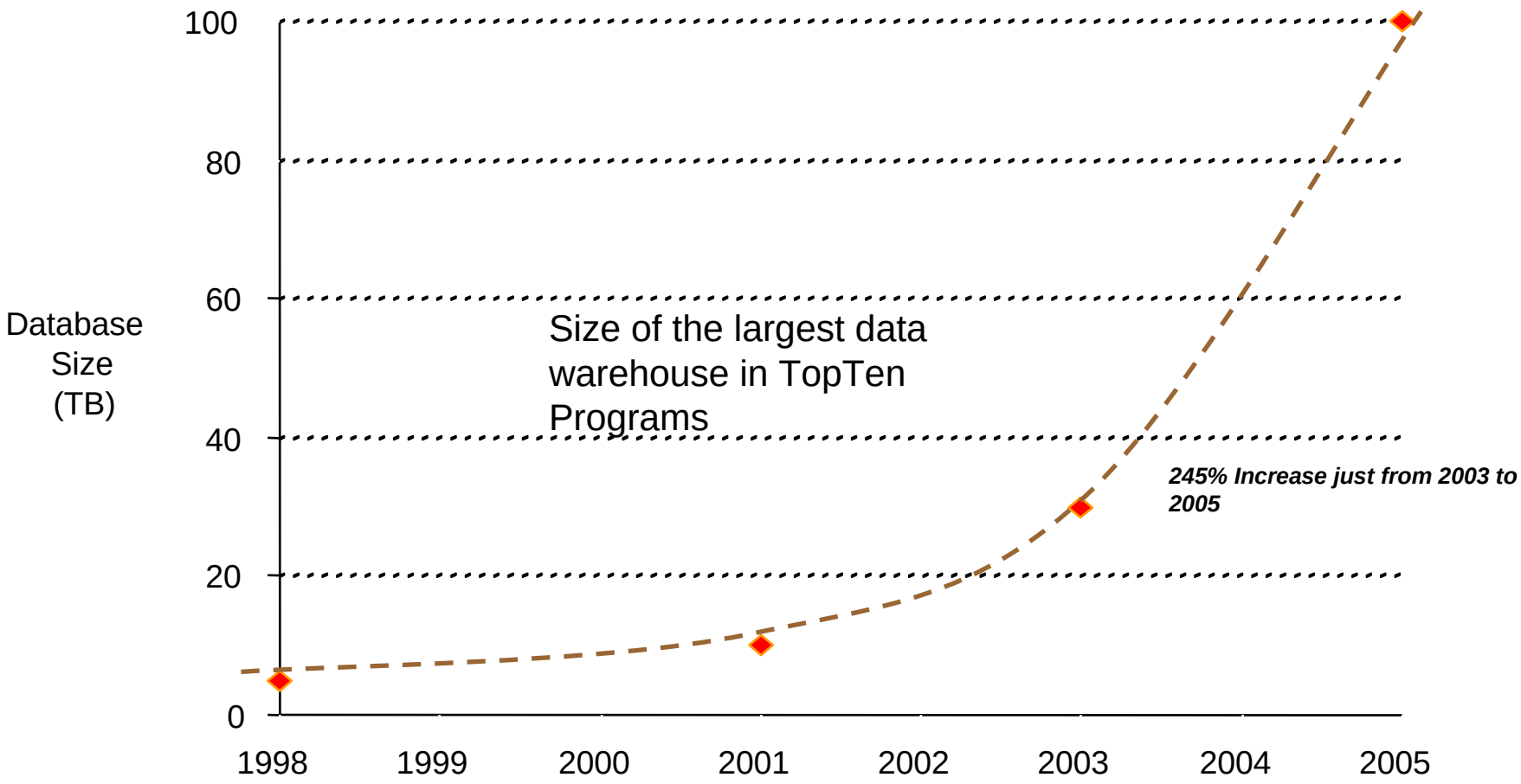
- **Compress Large Application Tables**
  - Transaction processing, data warehousing
- **Compress All Data Types**
  - Structured and unstructured data types
- **Typical Compression of 2-3 X**
  - Cascade storage savings throughout data center



Information Lifecycle Management

Managing Data Storage

Growing Data Volumes

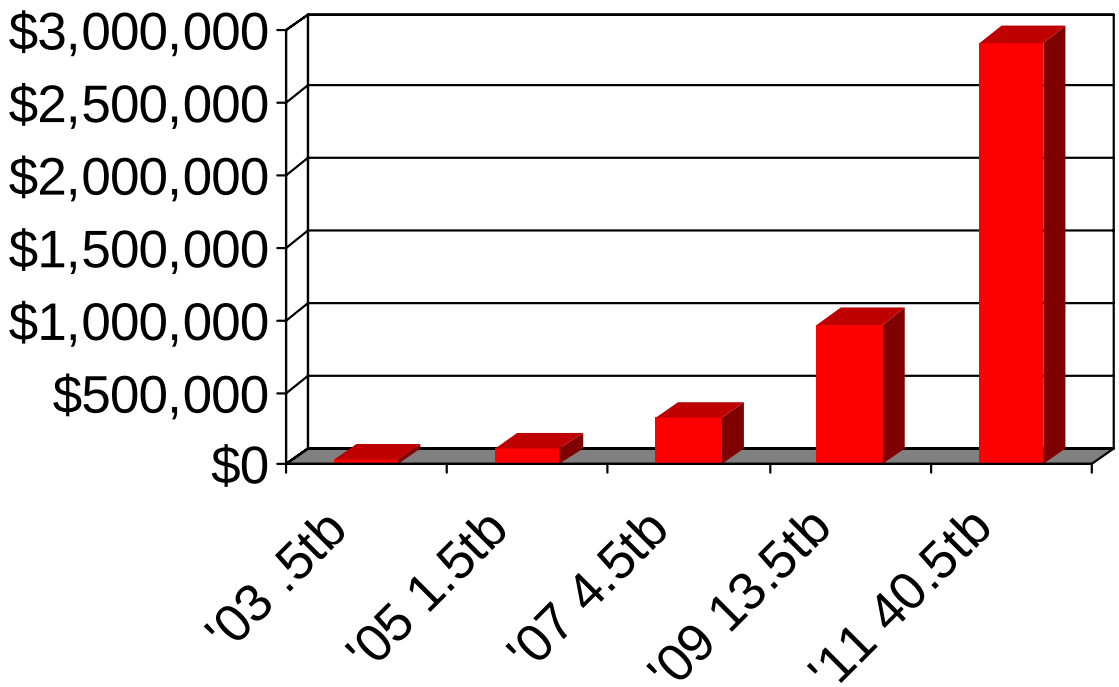


Source: 2005 TopTen Program, November 2005 © Winter Corporation, Waltham, MA, USA

Data is Tripling every Two Years

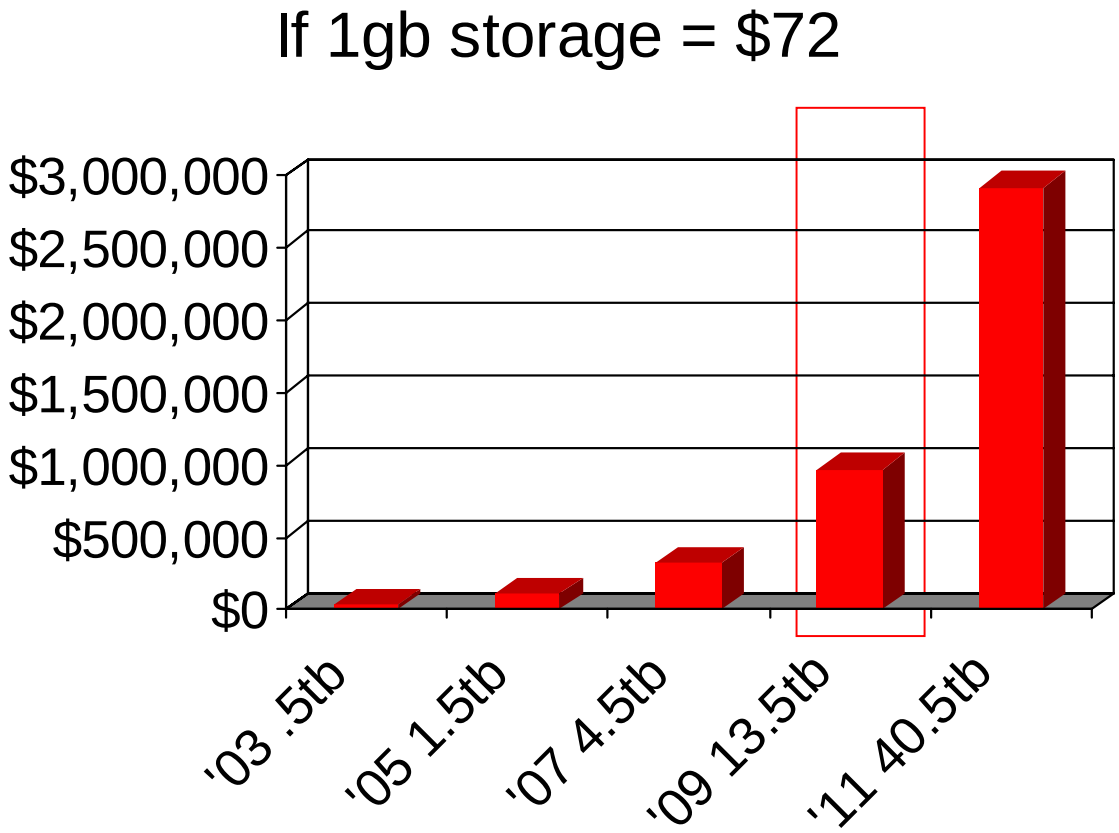
And storage costs increase accordingly…

If 1gb storage = $72



So how do we control storage costs?

Lets take example of 13.5 terabytes…



Traditional Storage Approach

All data resides on single storage tier

High Performance
Storage Tier
= $72 per Gb

Active

All data on active
= $972,000!

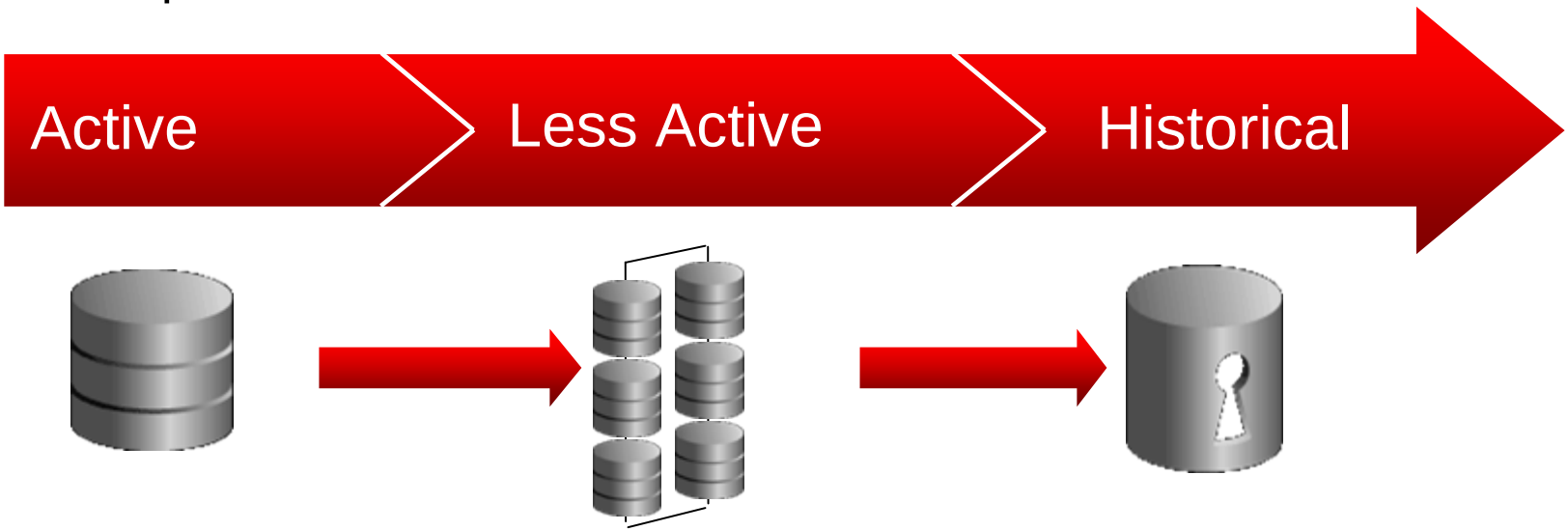
Information Lifecycle Management

Partition data onto appropriate storage tier

High Performance Storage Tier = $72 per Gb

Low cost Storage Tier = $14 per Gb

Read only Storage Tier = $7 per Gb



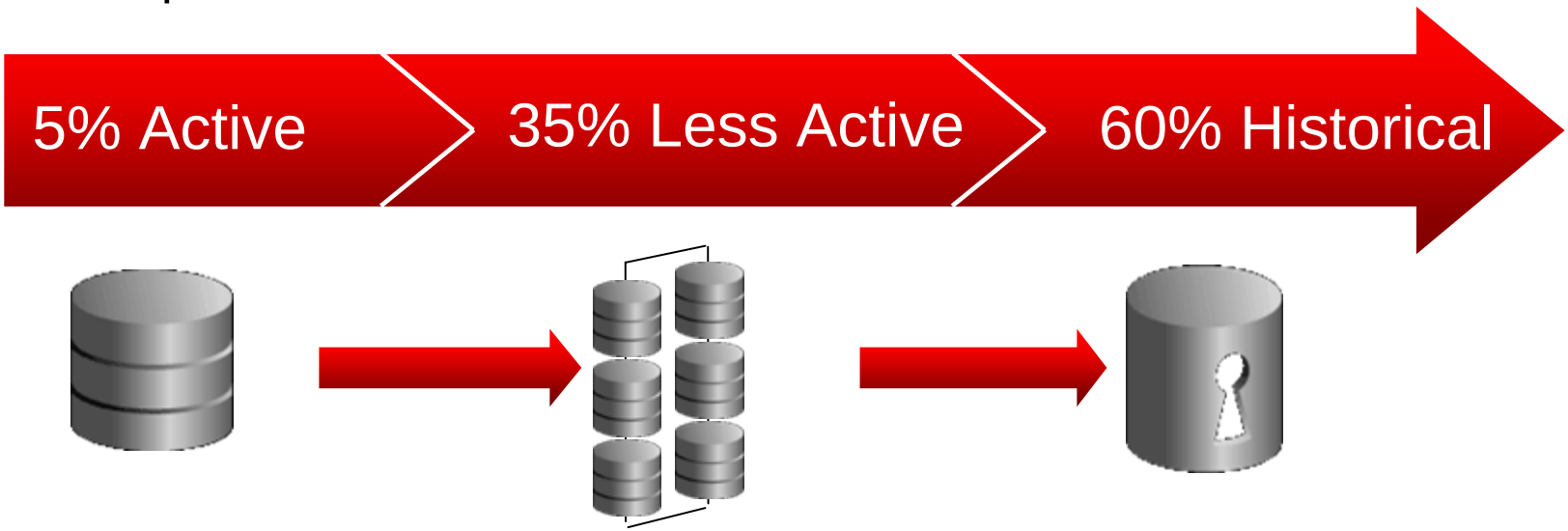
Information Lifecycle Management

Move data onto appropriate storage tier

High Performance Storage Tier = $72 per Gb

Low cost Storage Tier = $14 per Gb

Read only Storage Tier = $7 per Gb



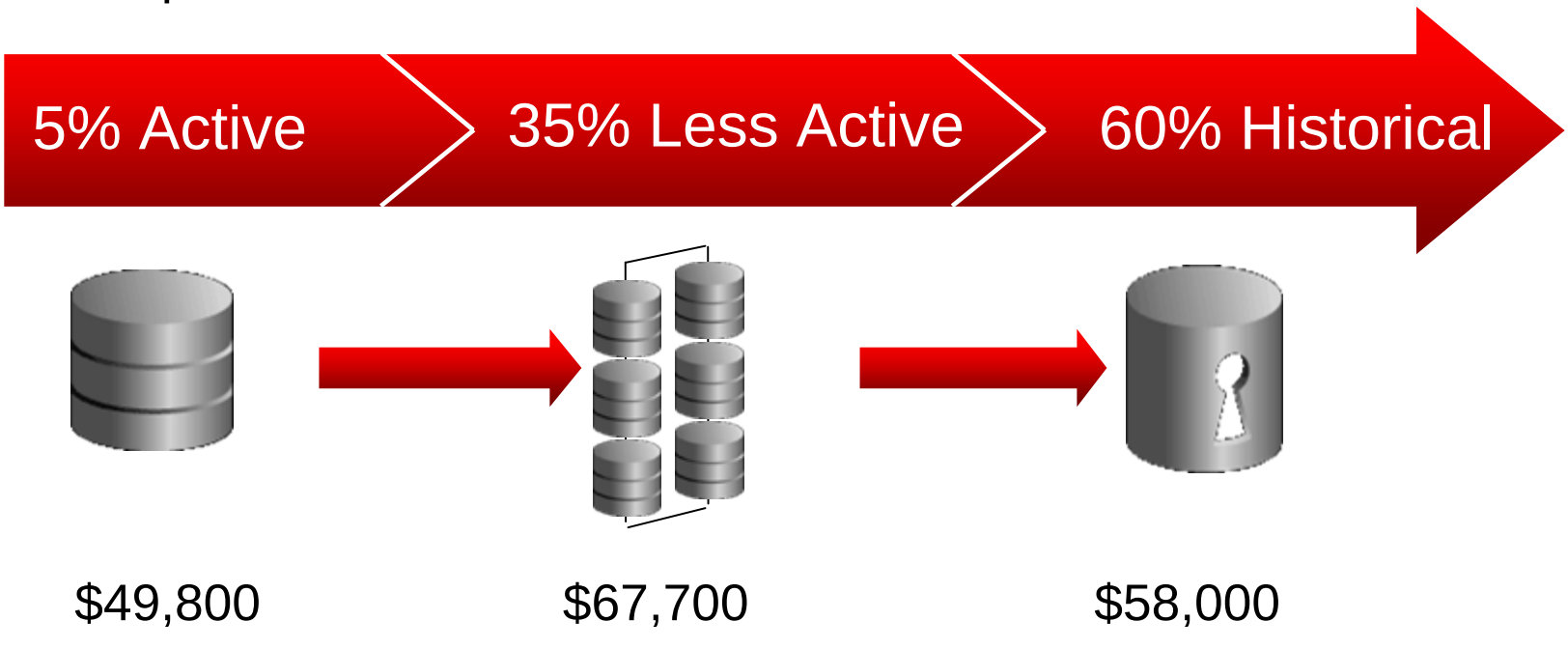
Information Lifecycle Management

Reduce storage costs accordingly

High Performance Storage Tier = $72 per Gb

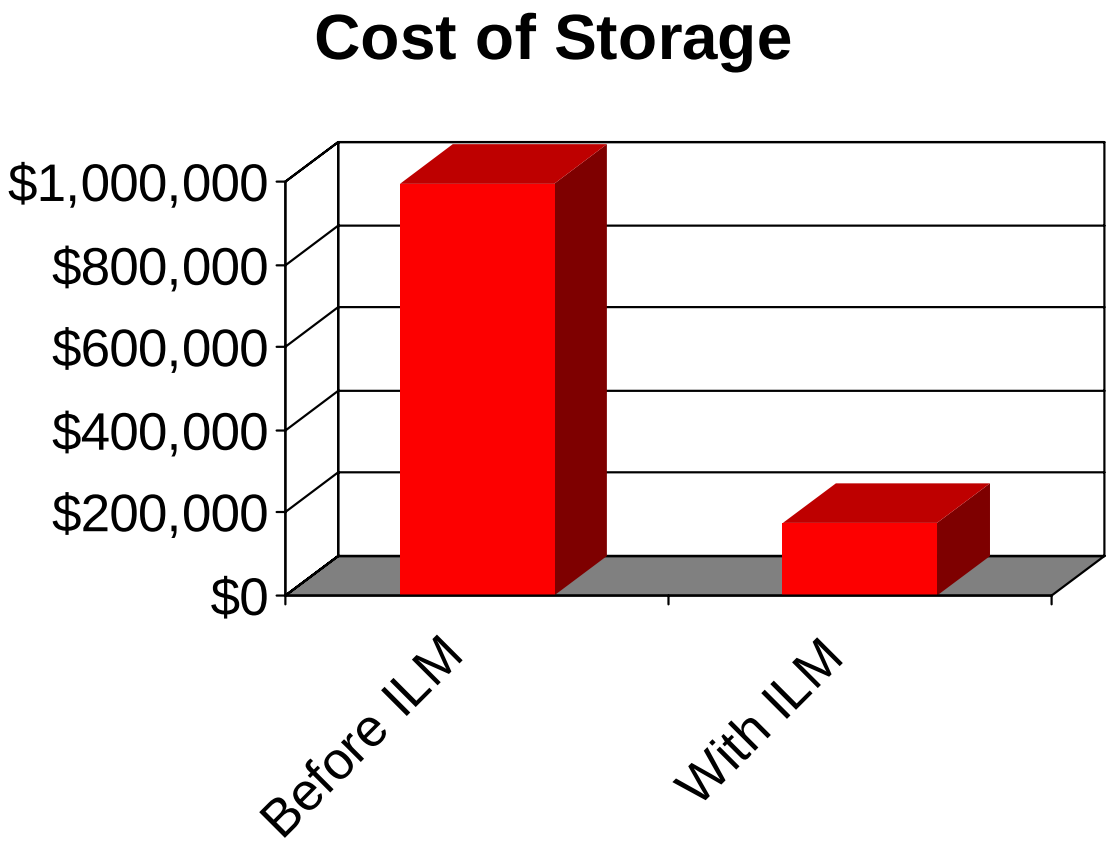
Low cost Storage Tier = $14 per Gb

Read only Storage Tier = $7 per Gb



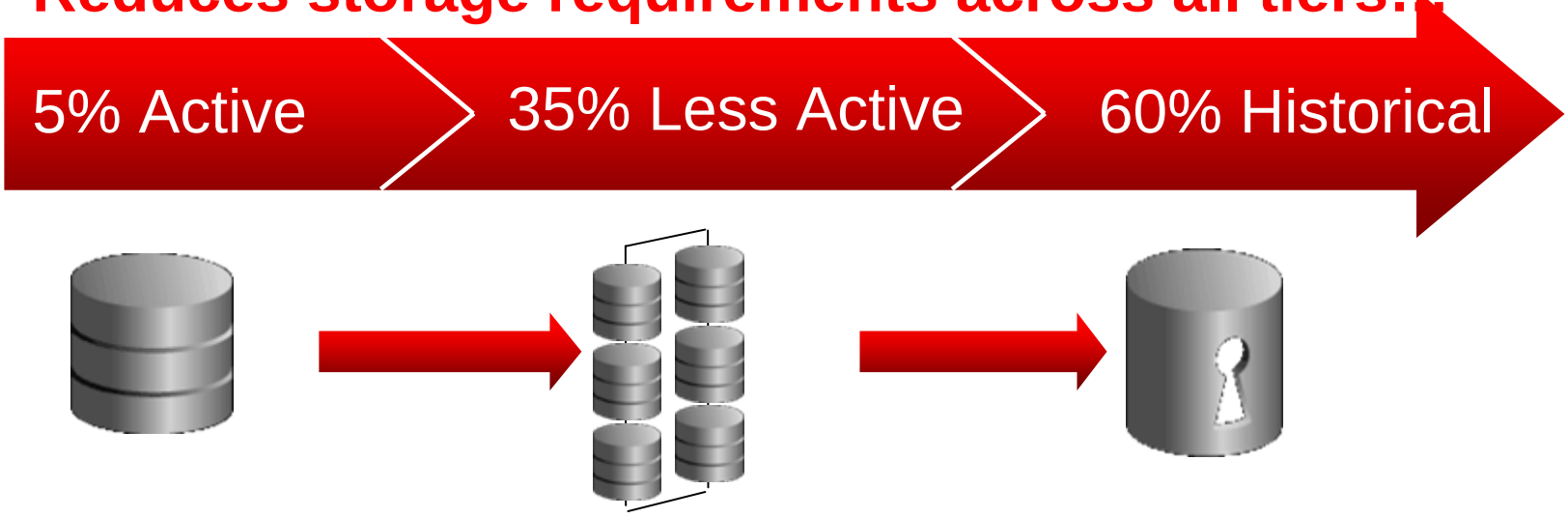
Impact of Partitioning?

Significantly reduces storage costs…



Advanced Compression

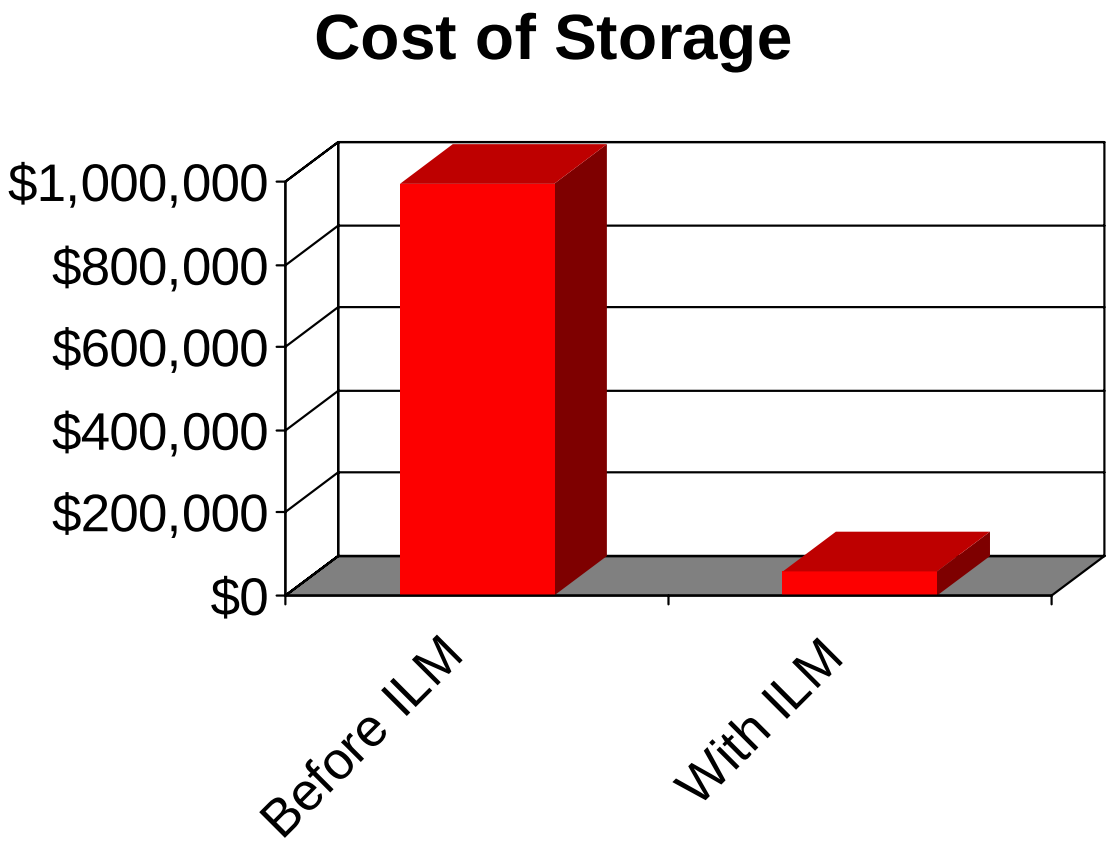
Reduces storage requirements across all tiers…



Lets use compression factor of 3

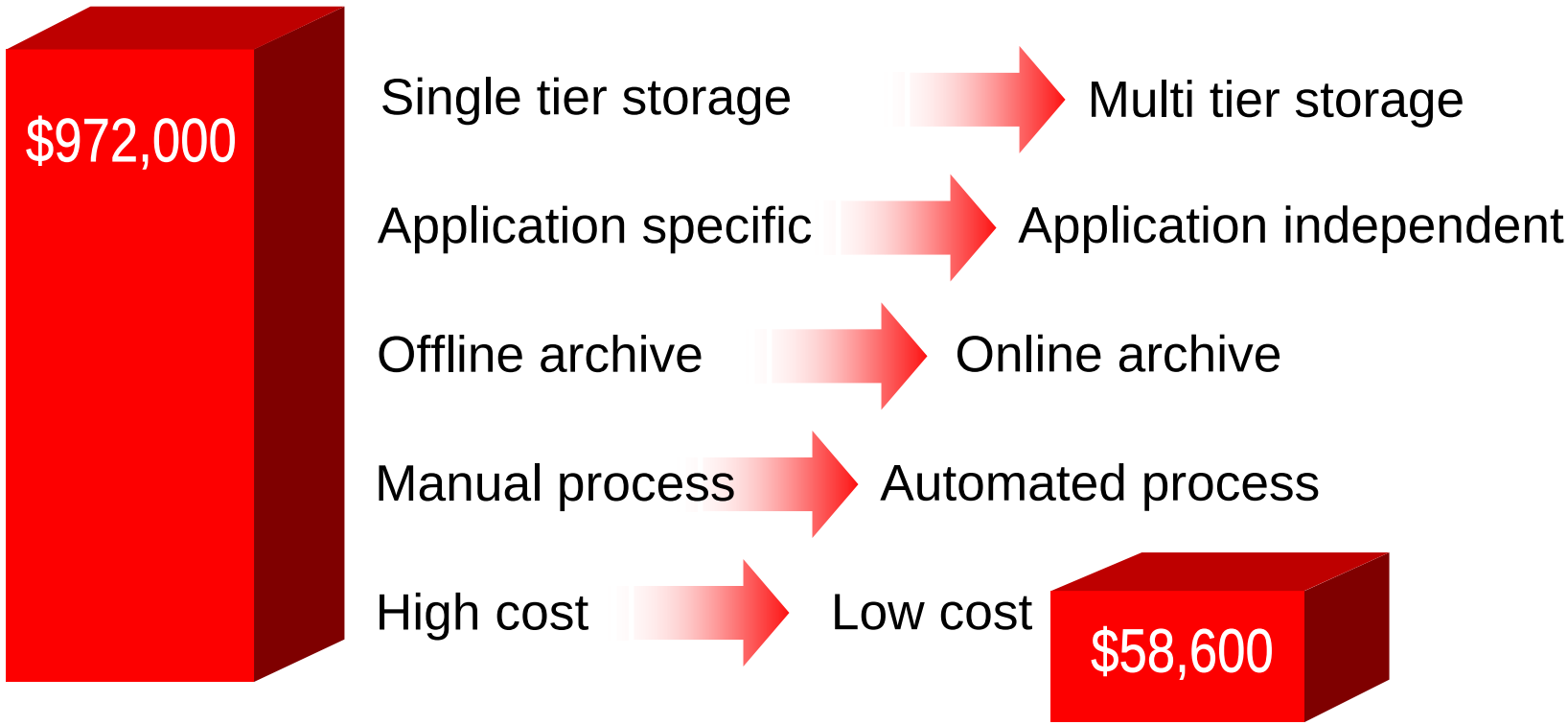
Impact of Data Compression

Compression further reduces storage costs…



Why Oracle Database 11g?

Managing data growth



Enabling Innovation with Oracle Database 11g

- Better business insight into all data types
- Managing data growth
- Higher quality of service at lower cost
- Pressure to manage change

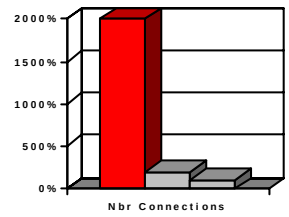
Quality of Service Challenges

All at lower cost

- Faster performance and easier scalability
- Greater data security and compliance
- Higher availability of access to information

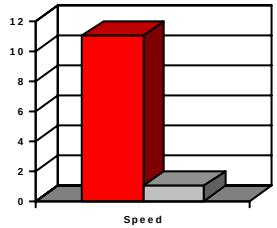
Faster Performance

Database Resident Connection Pool



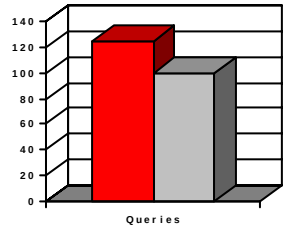
Up to 20 x connections

Java Just-In-Time Compiler



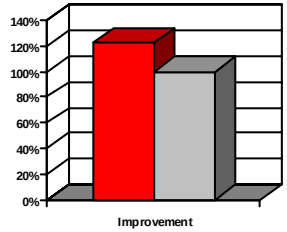
Up to 11 x Faster

Query Result Caching



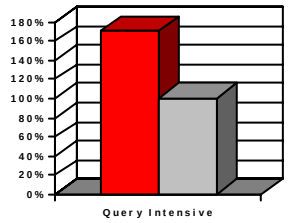
Up to 25% Faster

Client Side Caching



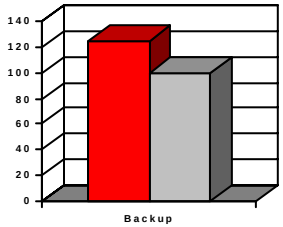
Up to 22% Faster

RAC Performance Enhancements



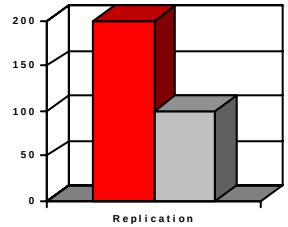
Up to 70% Faster

Oracle Secure Backup



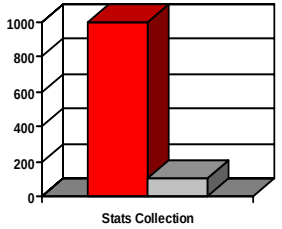
Up to 25% Faster

Oracle Streams Enhancements



Up to 2 x Faster

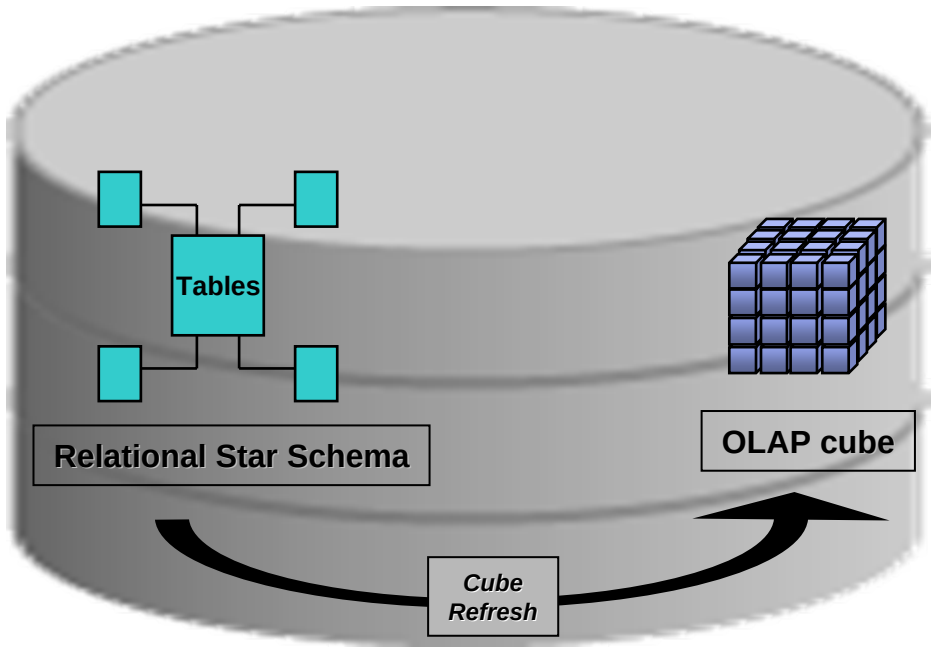
Optimizer Stats Collection



Up to 10 x Faster

OLAP-based Materialized Views

Typical Materialized Views Architecture Today



Oracle OLAP?

Faster. Simpler. Better insight.

Complex OLAP API	→	Transparent SQL Access
Hundreds of summary MV's	→	One OLAP Cube
Complex Data Refresh	→	Simple, Fast Data Refresh
Fast Query Performance for **Some** Summaries	→	Fast Query Performance for **All** Summaries

2/3 of Oracle DW's use Materialized Views today → **All** of them can benefit from Oracle OLAP

Security and Compliance

Encrypt Data in Database

New in Oracle Database 11g…

Tablespace level encryption

Hardware based master key protection

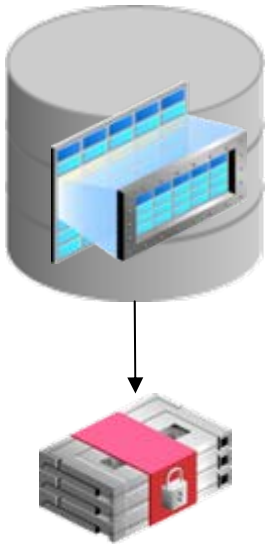
Transparent Data Encryption

Security and Compliance

Encrypt Backups

New in Oracle Database 11g…

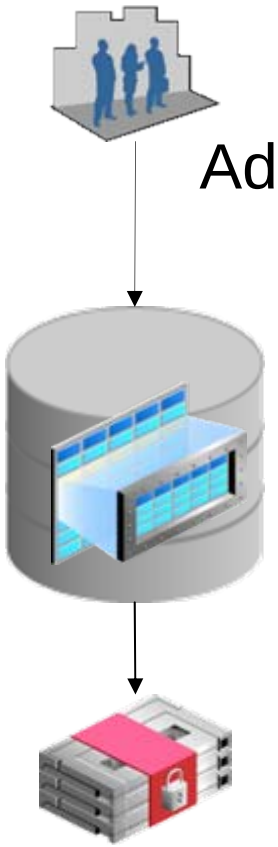
Backup compression



Oracle Secure Backup

Security and Compliance

Strongly Authenticate and Authorize End Users



New in Oracle Database 11g…

Kerberos authentication

Strong passwords

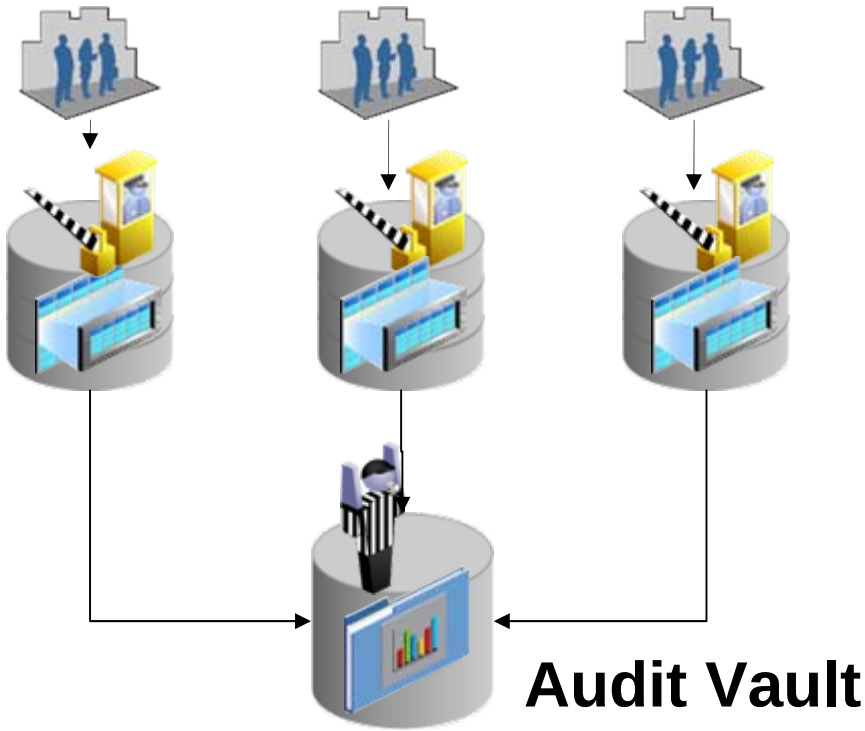
Security and Compliance

Add Multi-factor DBA Controls

Database Vault

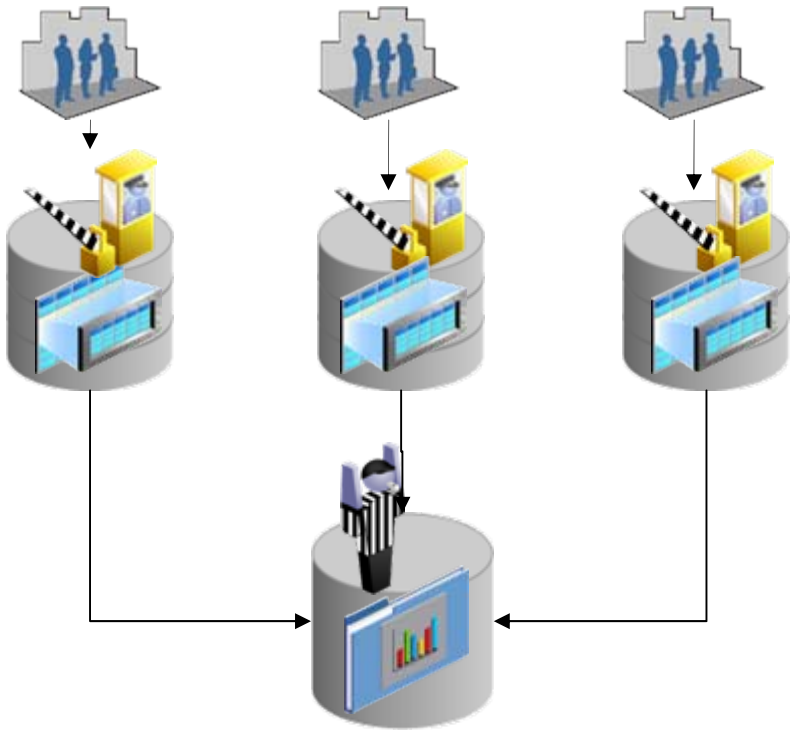
Security and Compliance

Consolidate and Monitor Audit Information



Security and Compliance

Consolidate and Monitor Audit Information



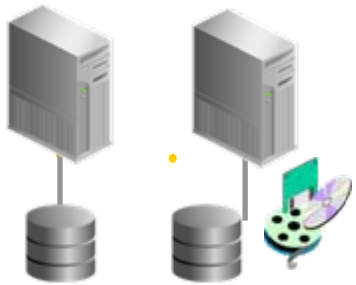
Oracle Configuration Pack

Architected for Maximum Availability

Providing highest availability at lowest cost

New in Oracle Database 11g…

Data Recovery Advisor



Protect Against Data Loss

- Oracle Recovery Manager
- Oracle Secure Backup

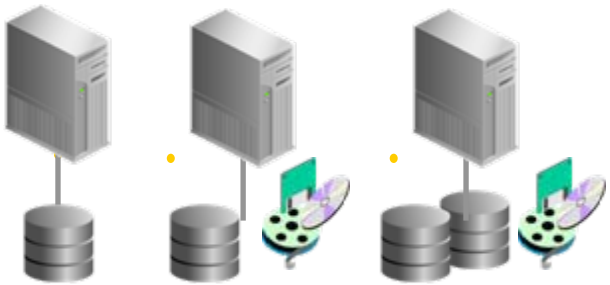
Architected for Maximum Availability

Providing highest availability at lowest cost

New in Oracle Database 11g…

Preferred Mirror Read

Fast Mirror Resync

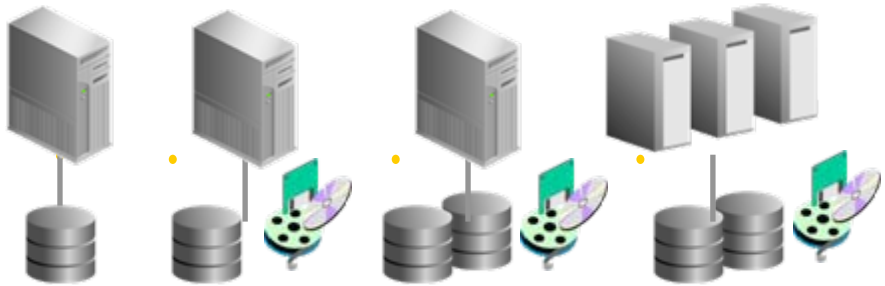


Protect Against Disk Loss

- Automatic Storage Management

Architected for Maximum Availability

Providing highest availability at lowest cost



New in Oracle Database 11g…

XA Transactions spanning multiple servers

Improved runtime connection load balancing

Protect Against Server Loss

- Oracle Real Application Clusters

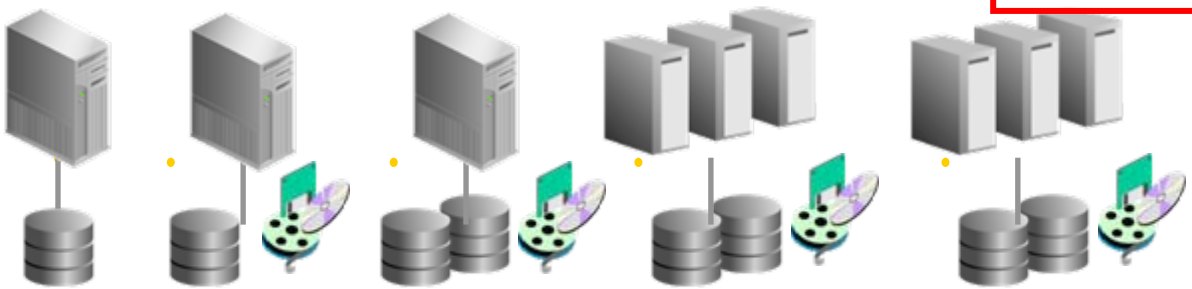
Architected for Maximum Availability

Providing highest availability at lowest cost

New in Oracle Database 11g…

Flashback Transaction

Total Recall



Protect Against Human Error

- Flashback

Architected for Maximum Availability

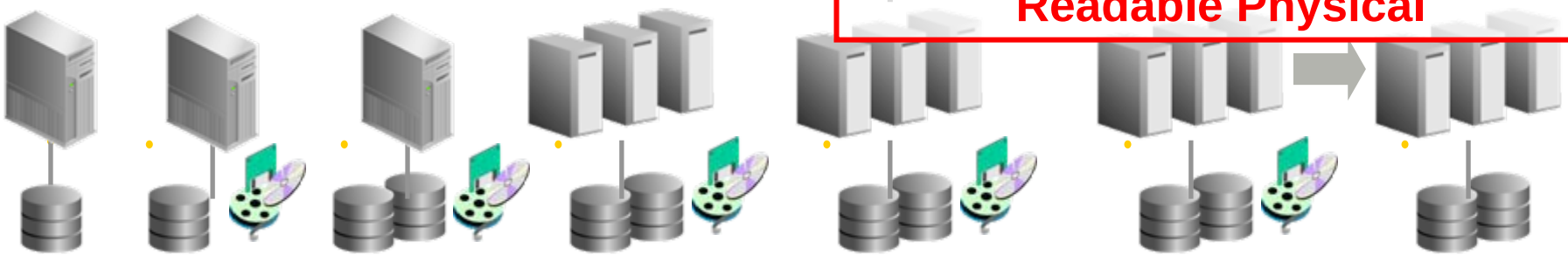
Providing highest availability at lowest cost

New in Oracle Database 11g…

Snapshot Standby

Incremental Backups on Physical

Readable Physical



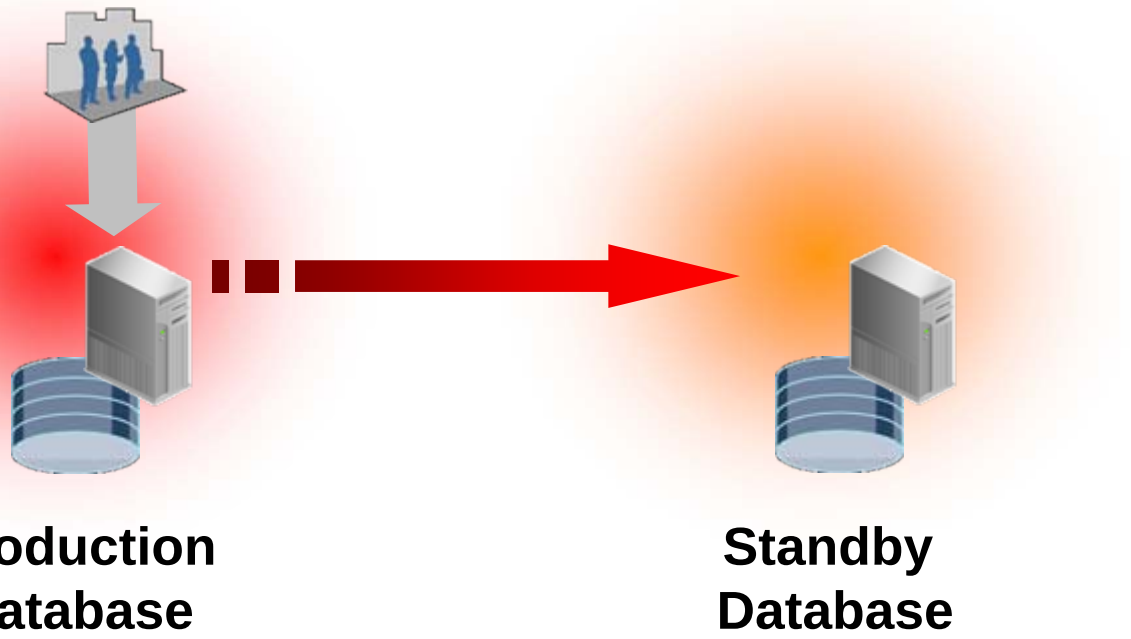
Protect Against Site Failure

- Oracle Data Guard

Data Guard

Traditional Disaster Recovery Operation

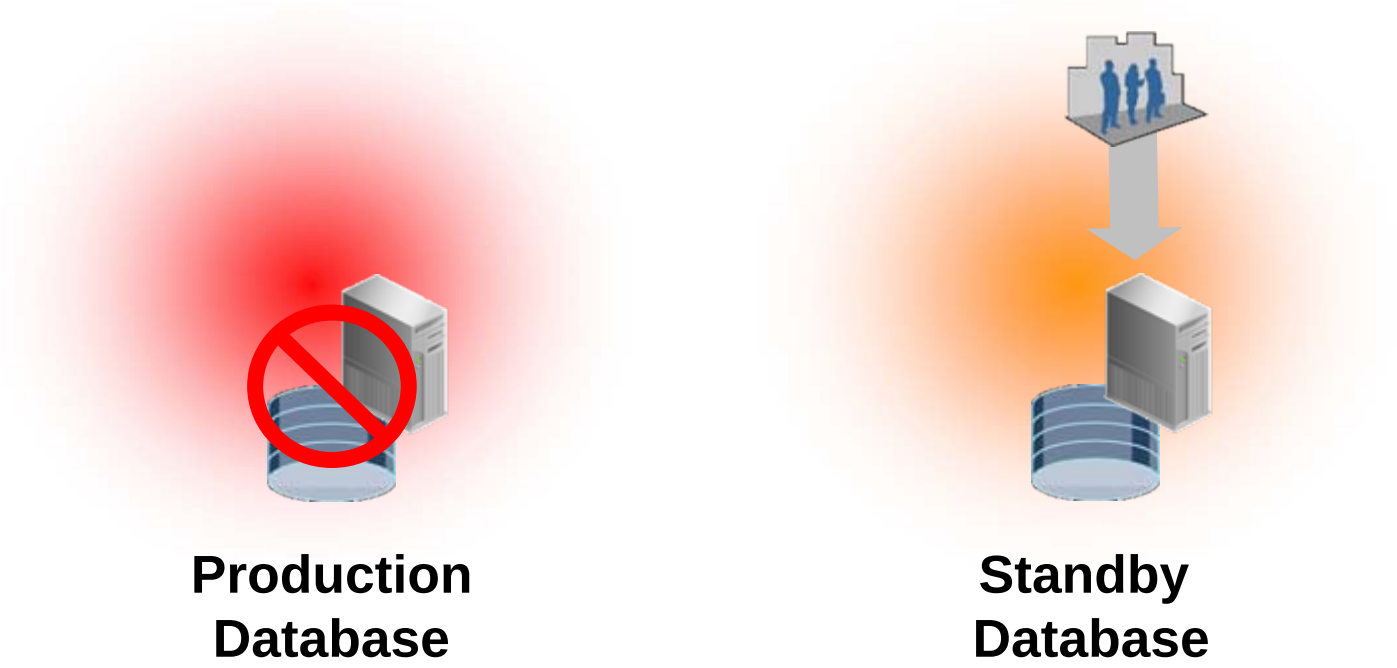
Protection from disaster only



- Standby database remains ‘closed’ in recovery mode

In event of Production Failure…

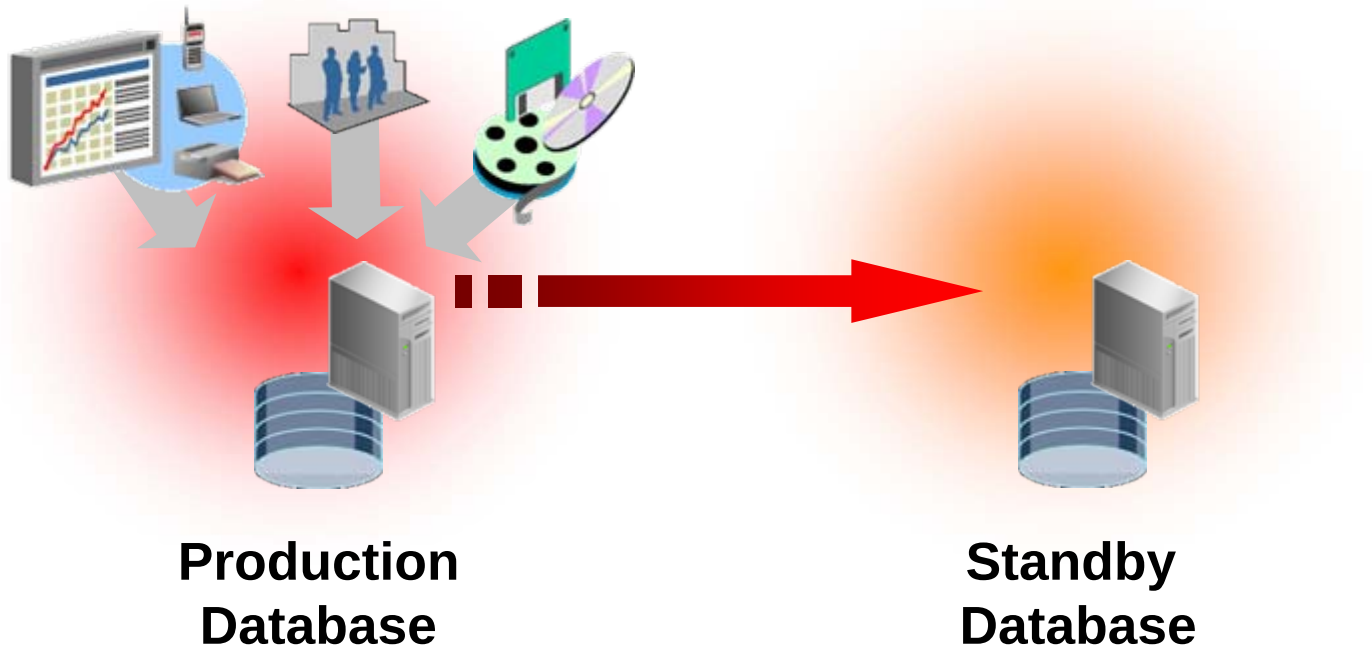
Workload shifts to standby database



- Standby database ‘opens’ for normal operations

Disaster Recovery Challenge

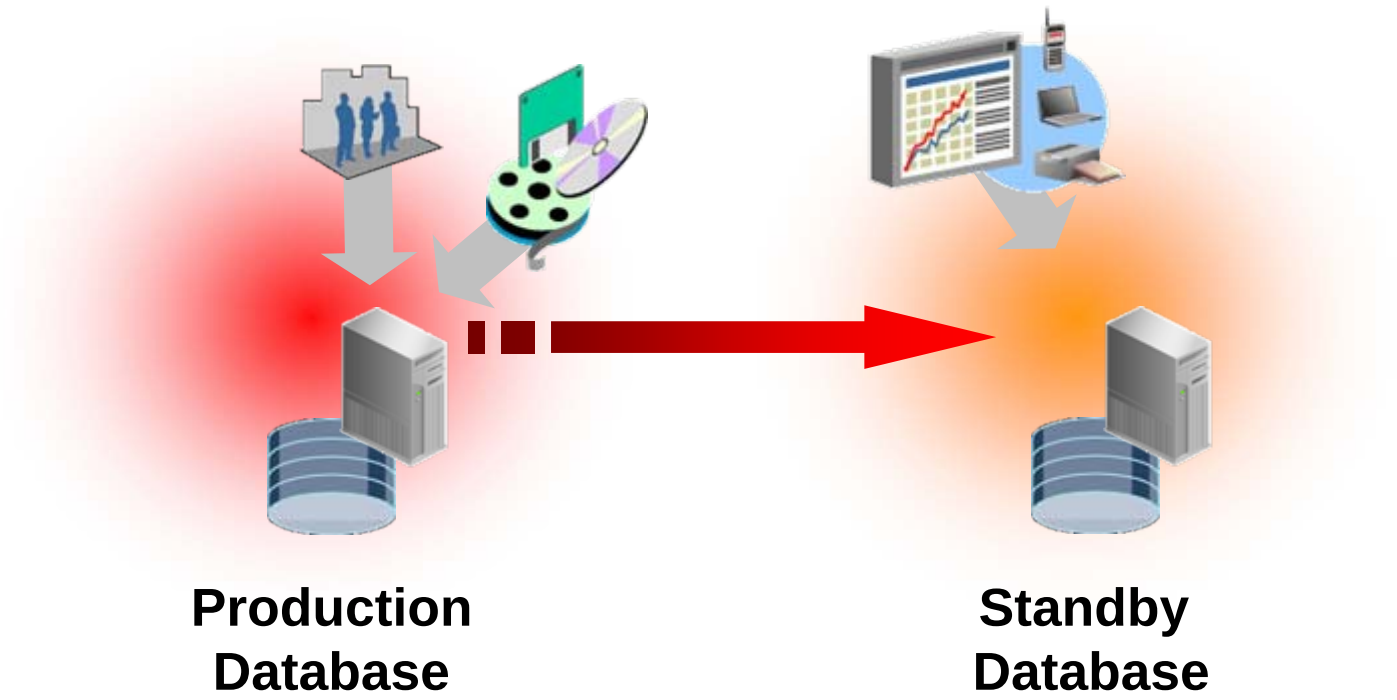
Investment in Disaster Recovery only



- Applications, backups, reports run on production only

With Oracle Data Guard

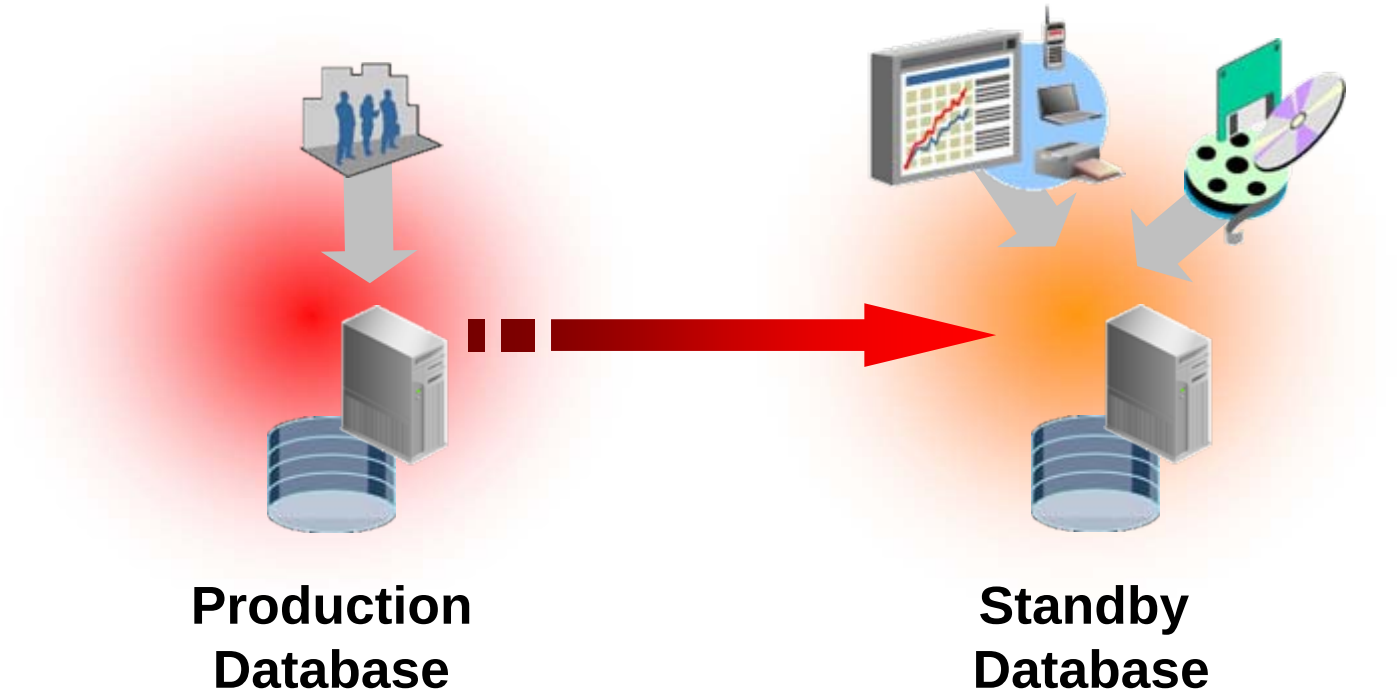
Offload production reporting to standby



- Simultaneously available in read and recovery mode

With Oracle Data Guard

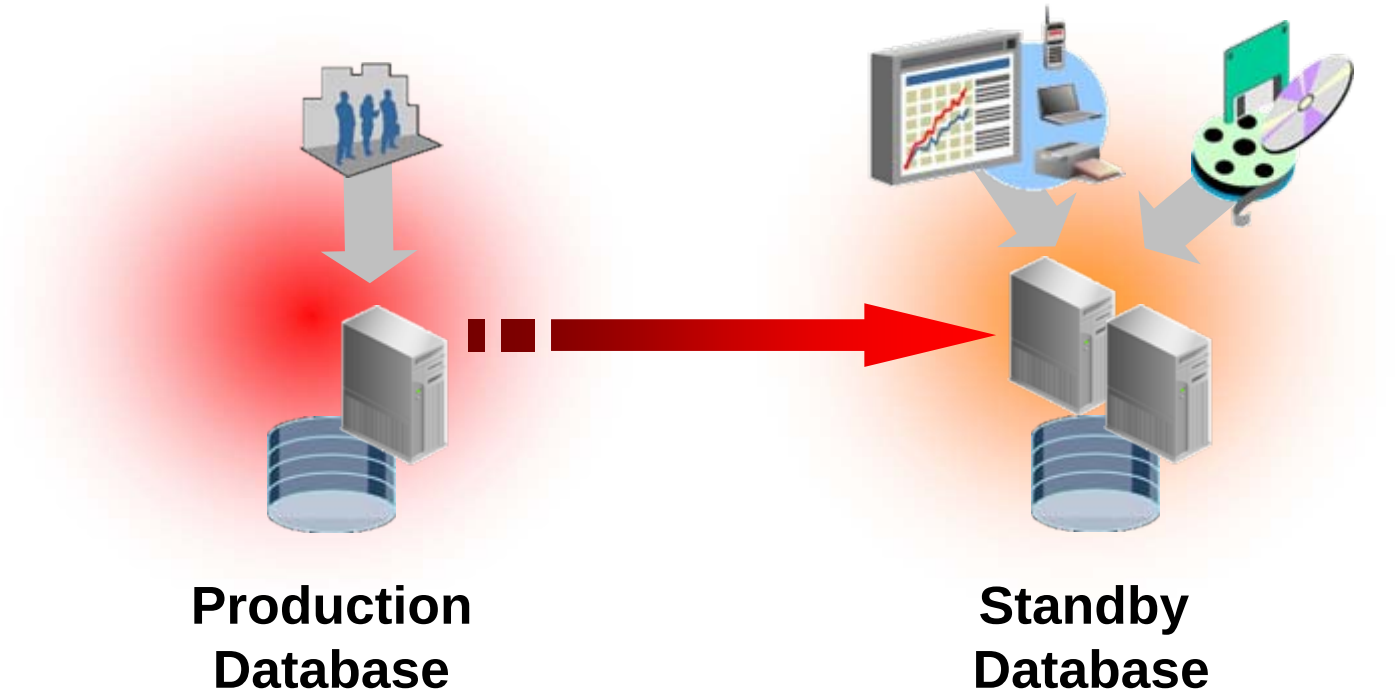
Offload database backups to standby



- Complete database and fast incremental backups

With Oracle Data Guard

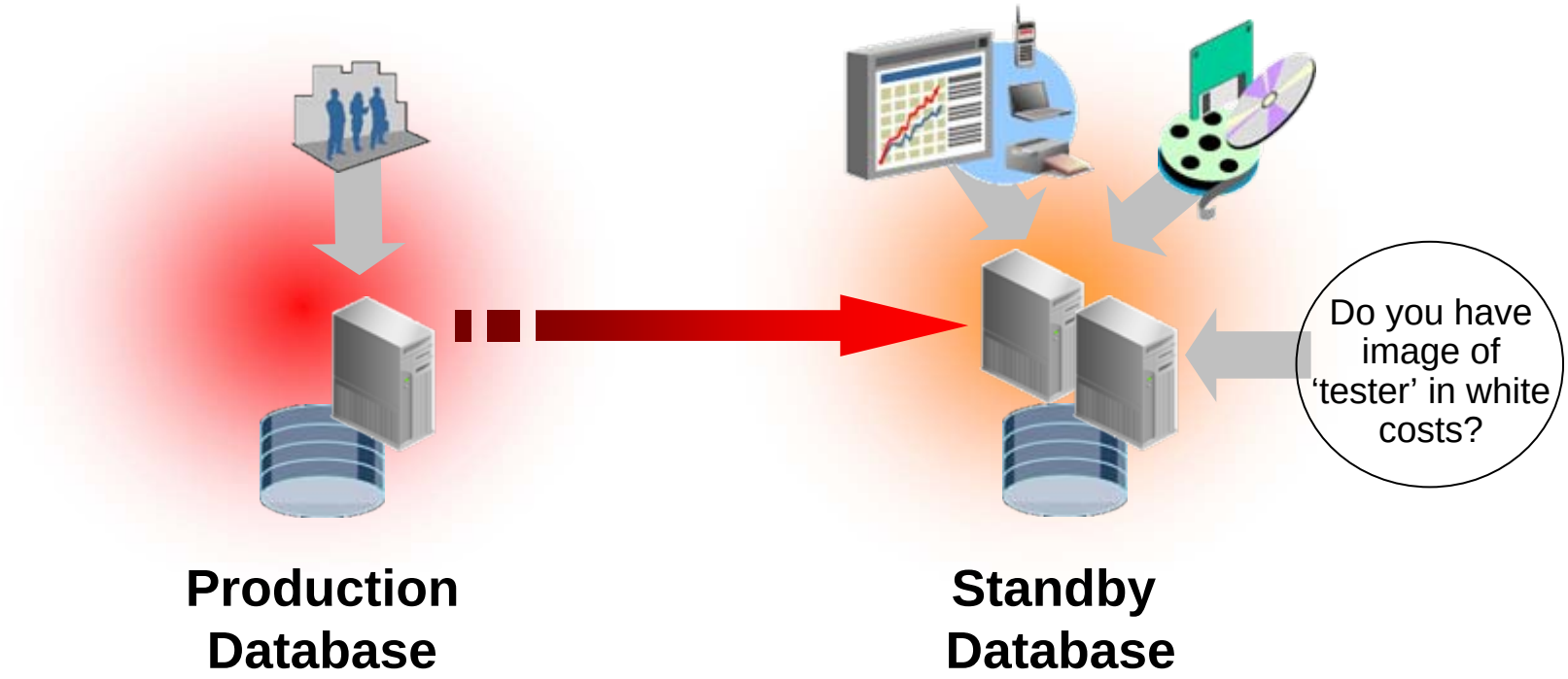
'Rolling upgrades' and changes



- Test on standby and 'roll' to production

With Oracle Data Guard

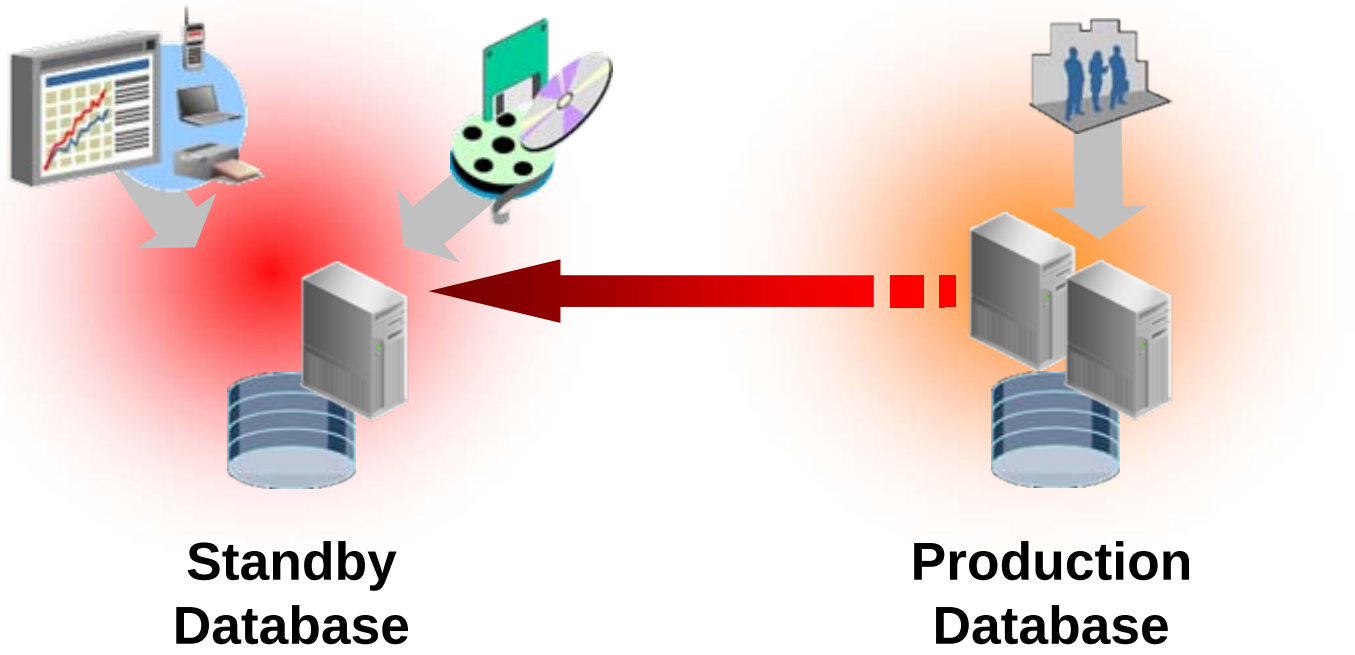
Test our changes



- Switch to 'snapshot' standby for testing purposes

With Oracle Data Guard

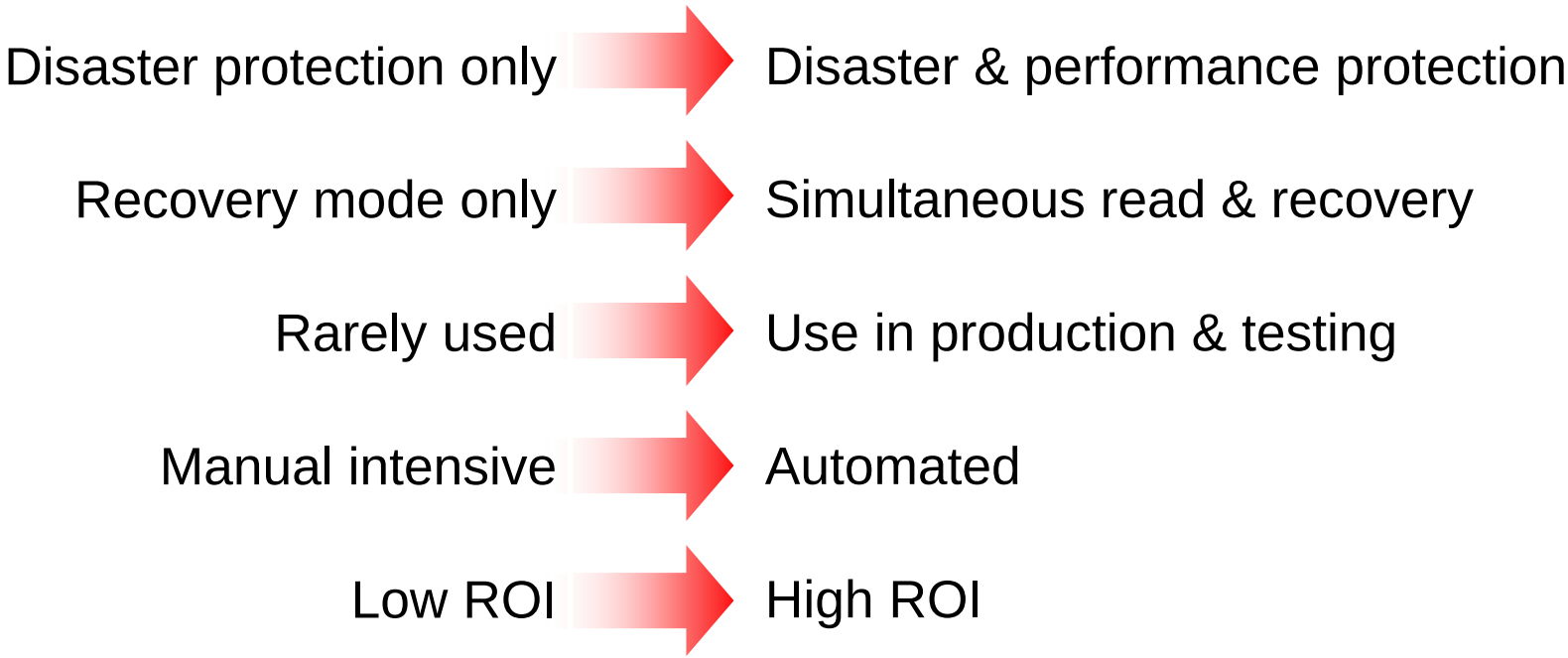
Switchover to new production system



- Changed standby becomes production

Why Oracle Data Guard?

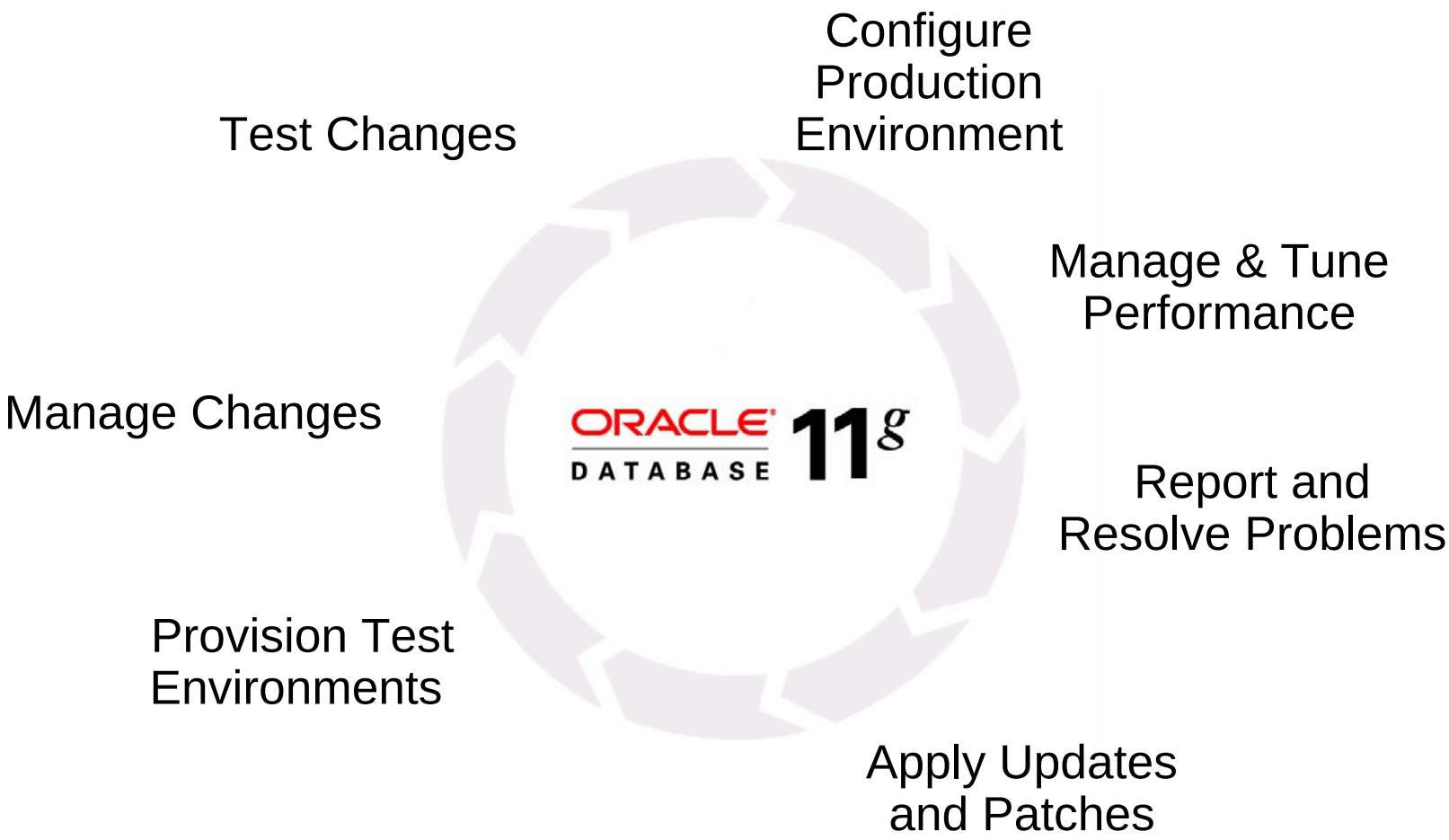
Invest in Disaster and Performance Protection



Enabling Innovation with Oracle Database 11g

- Better business insight into all data types
- Managing data growth
- Higher quality of service at lower cost
- Pressure to manage change

Lifecycle of Change Management

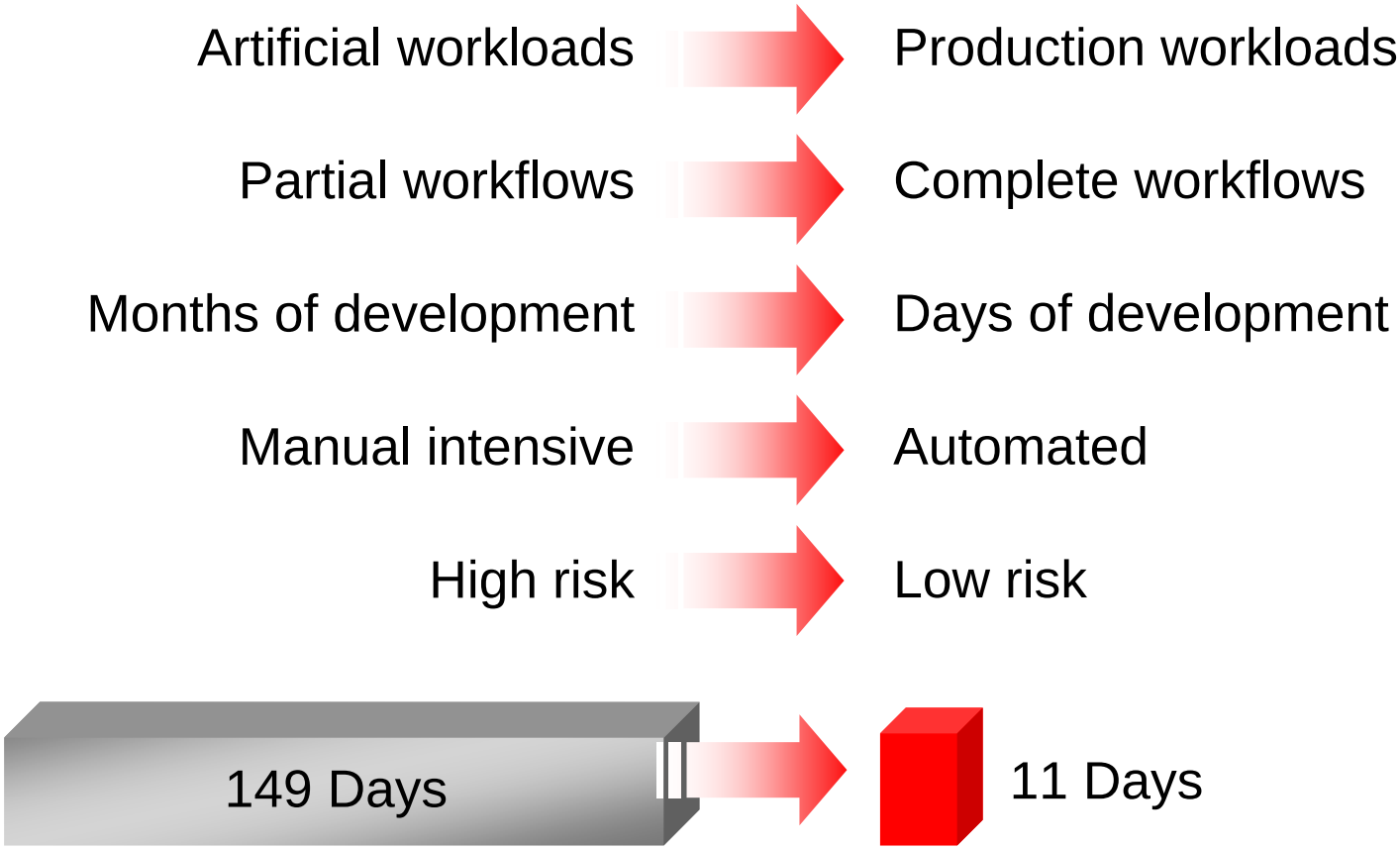


Real Application Testing

Preserve Order Amid Change

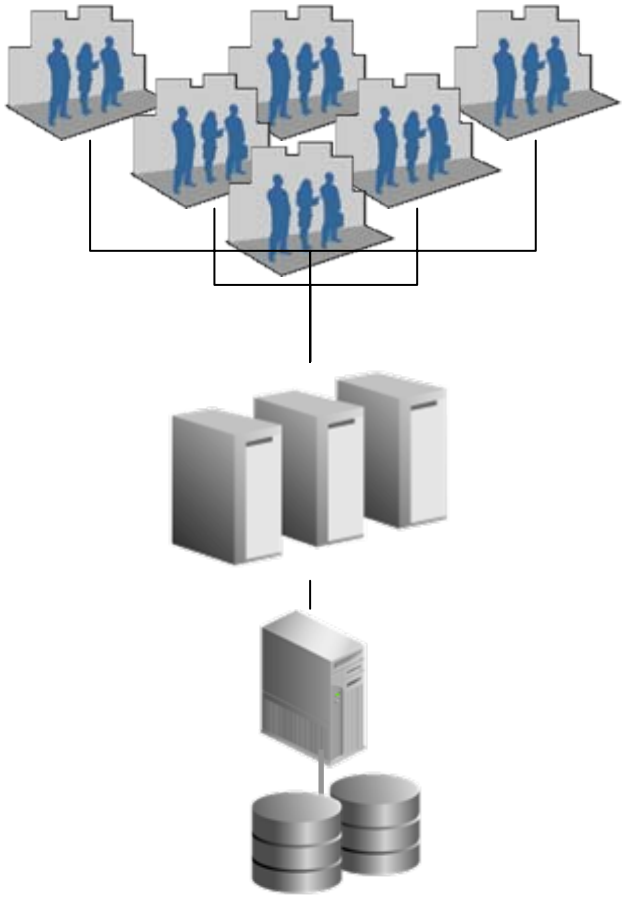
Oracle Real Application Testing

Innovate Change Faster



Application Testing Today

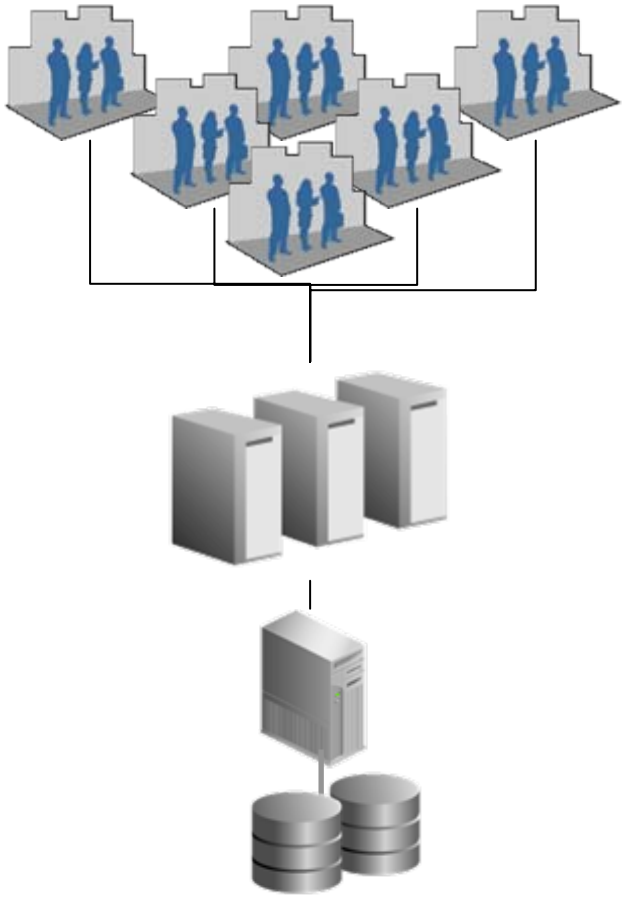
Production – 1,000s of Real Online Users



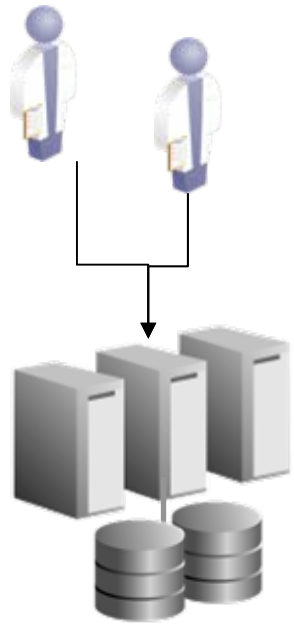
PRODUCTION

Application Testing Today

Test – 1-2 testers trying to be 1,000s of users



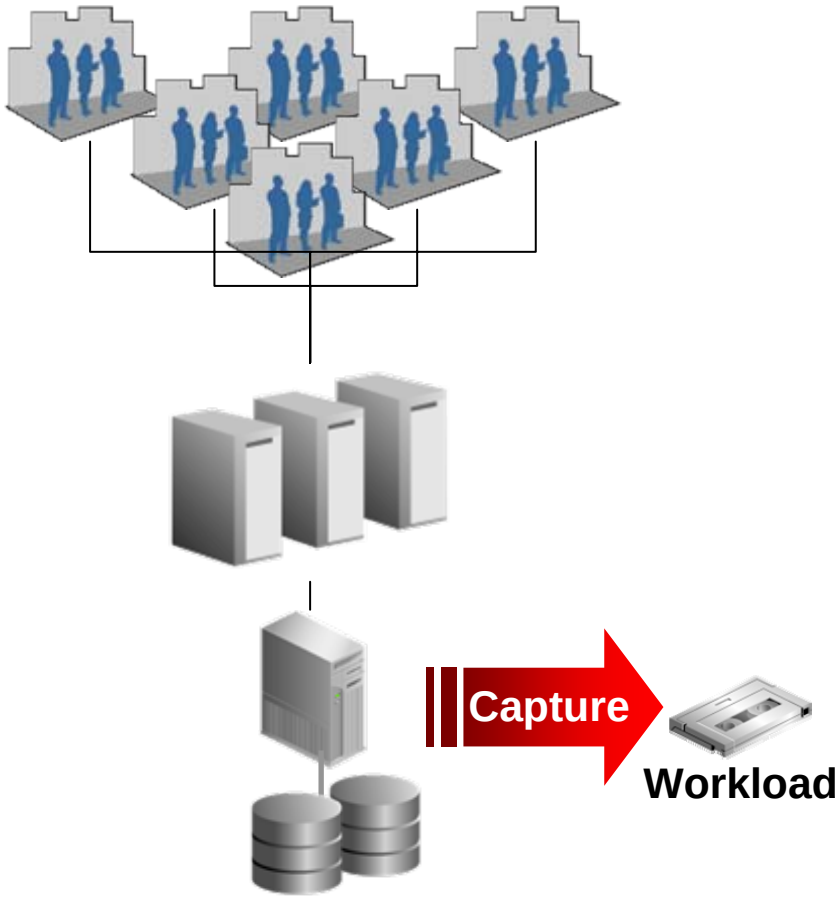
PRODUCTION



TEST

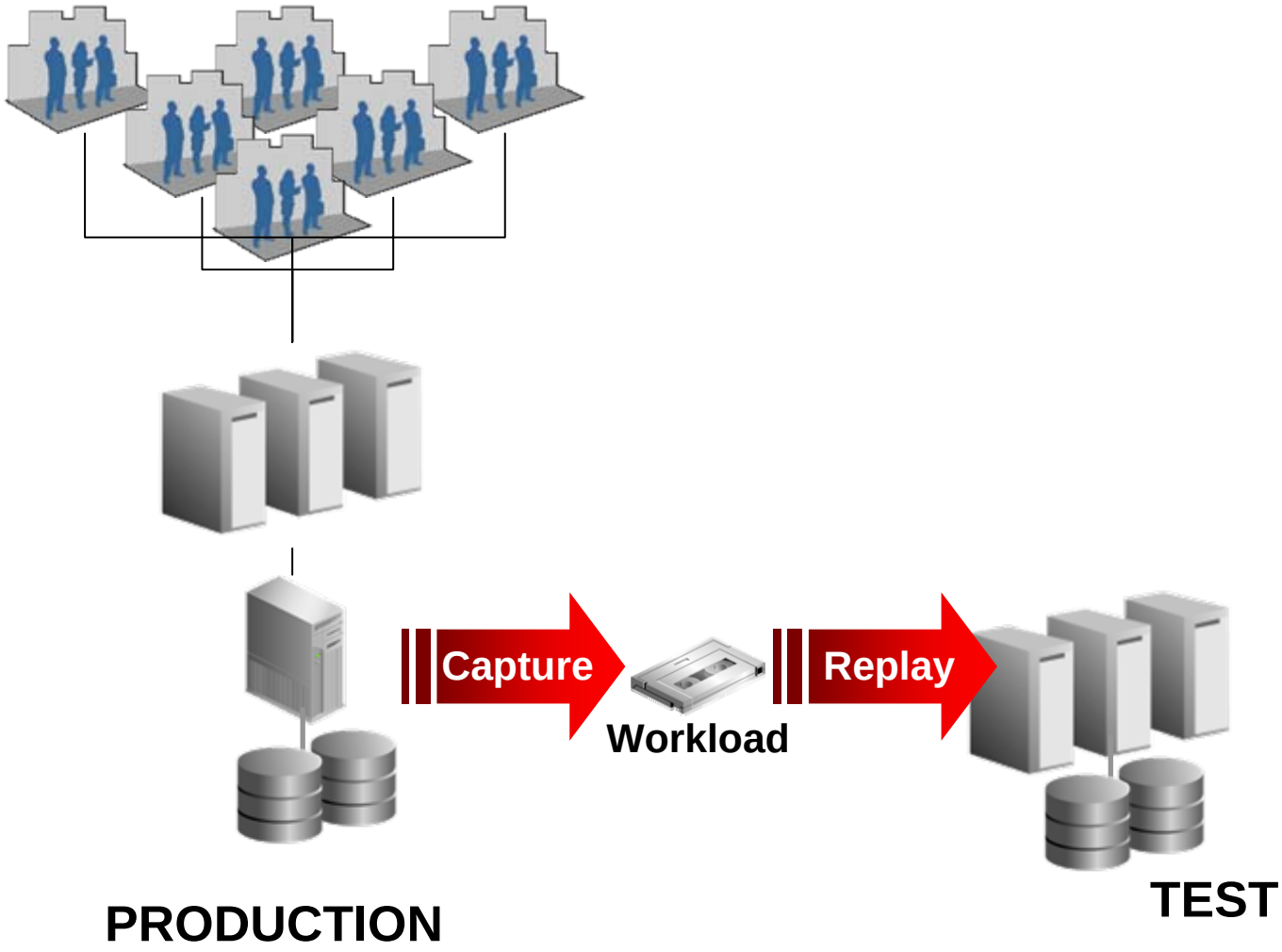
Real Application Testing

Workload for 1,000s of Online Users Captured



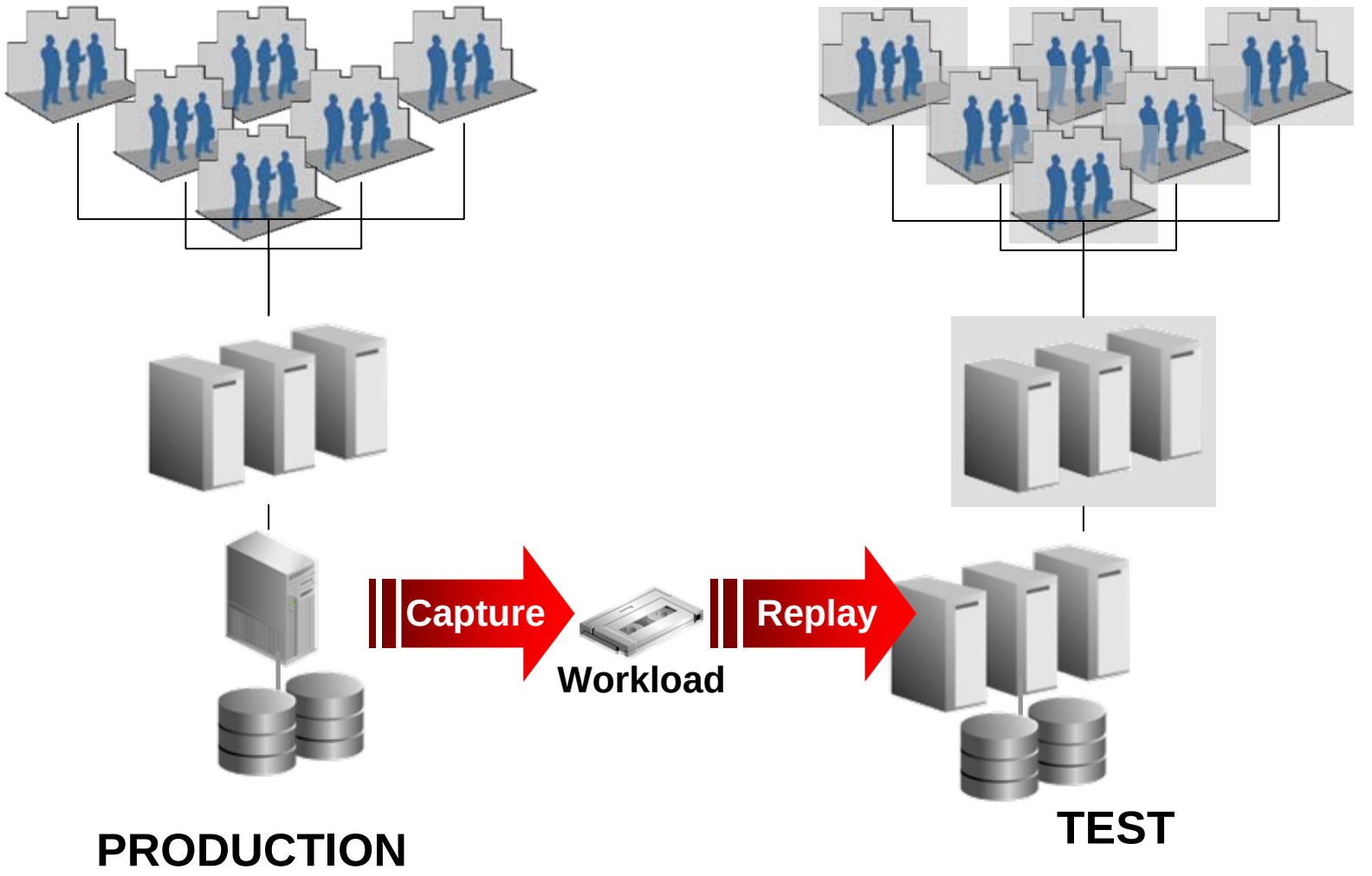
Real Application Testing

Workload for 1,000s of Online Users Replayed

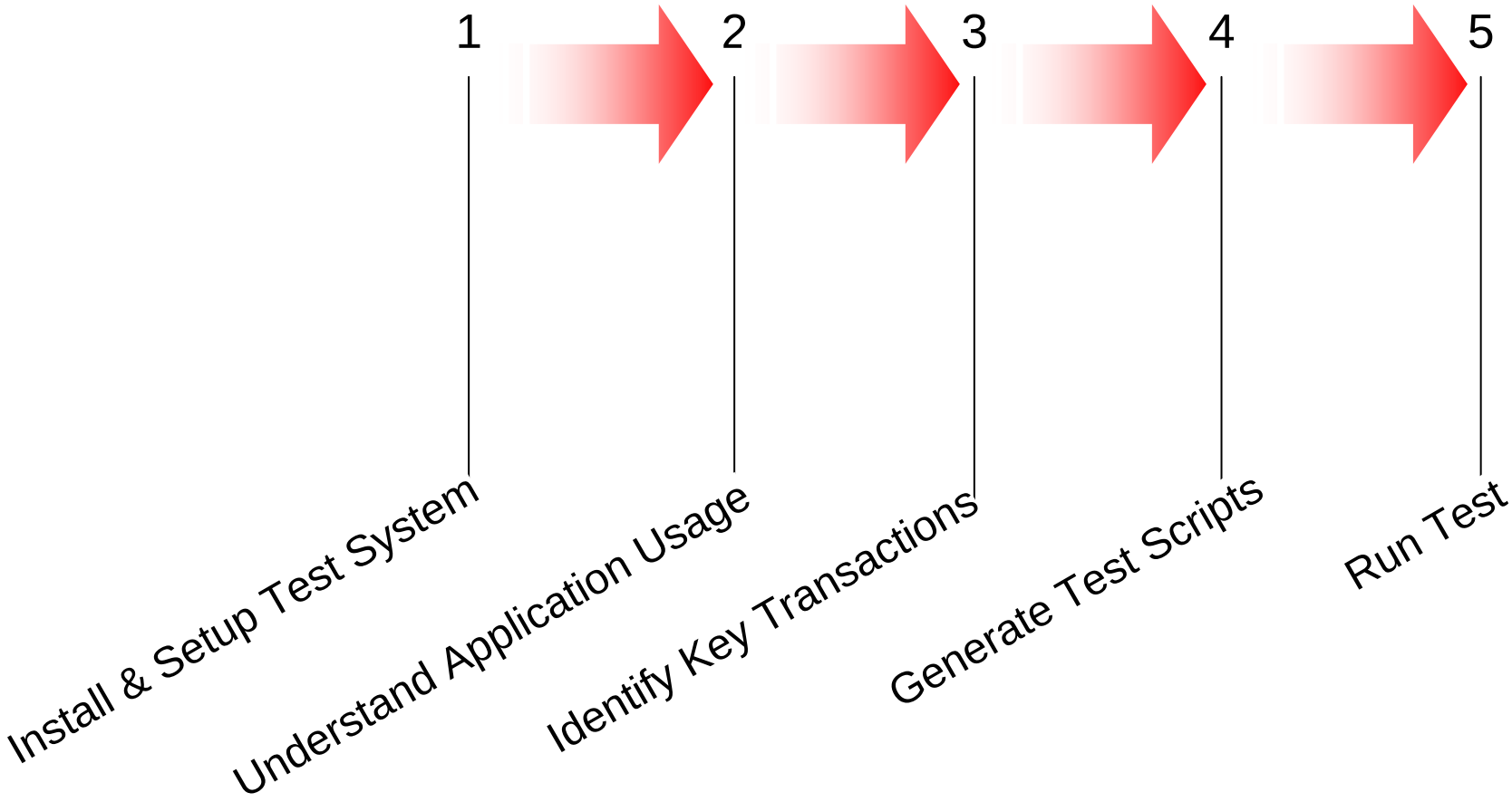


Real Application Testing

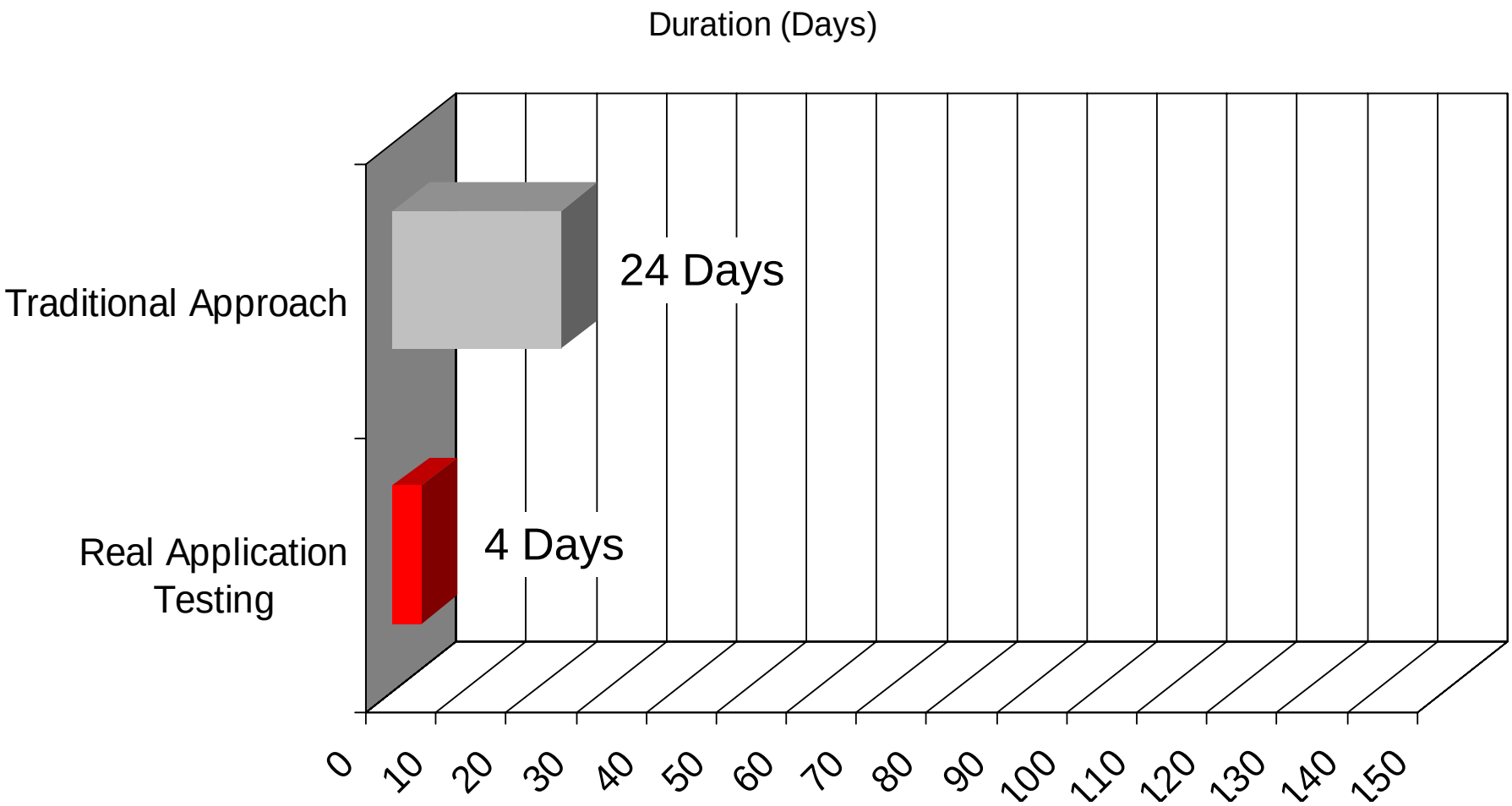
Test your system changes at product levels



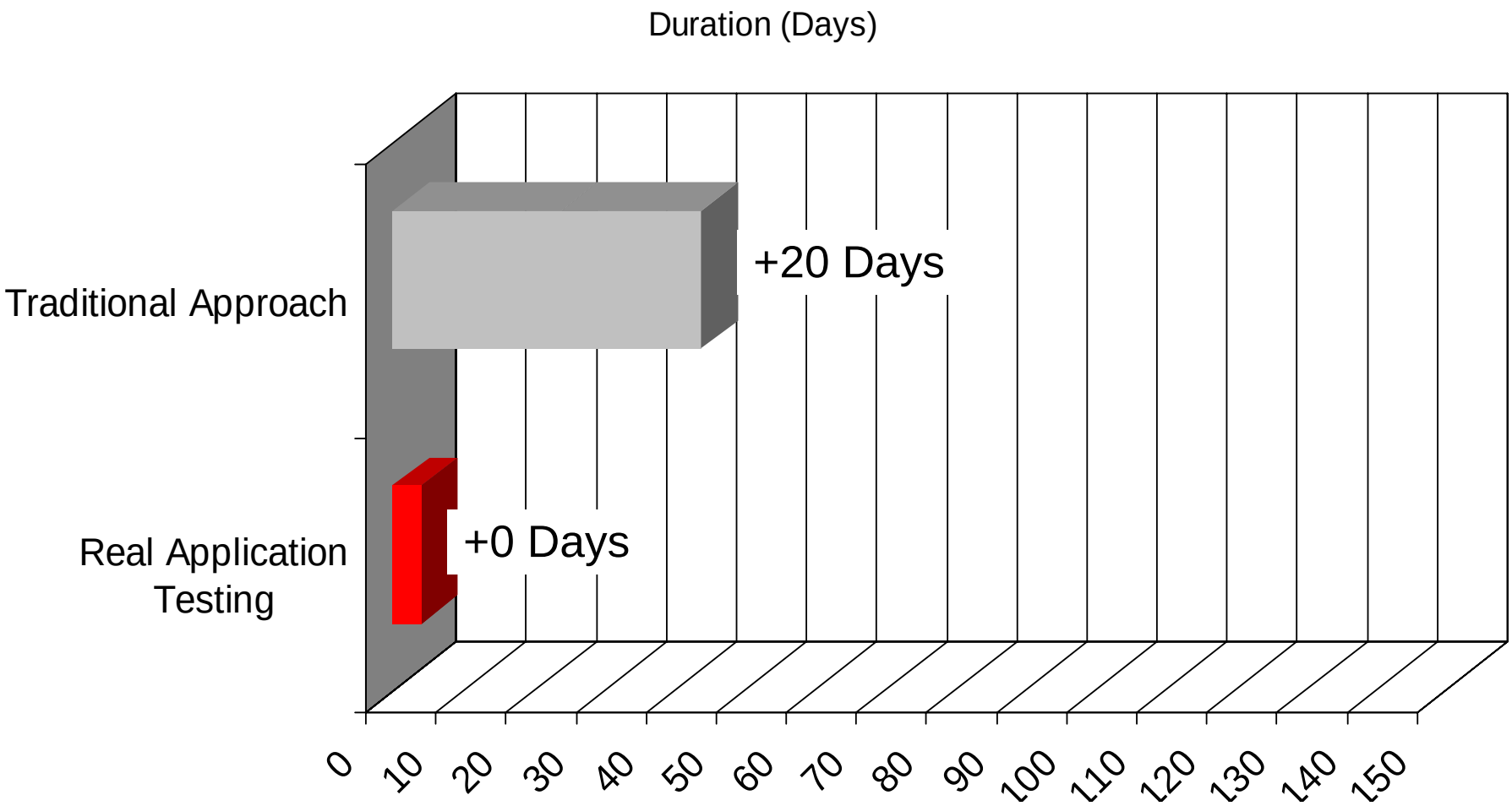
Typical Steps in Test Phase



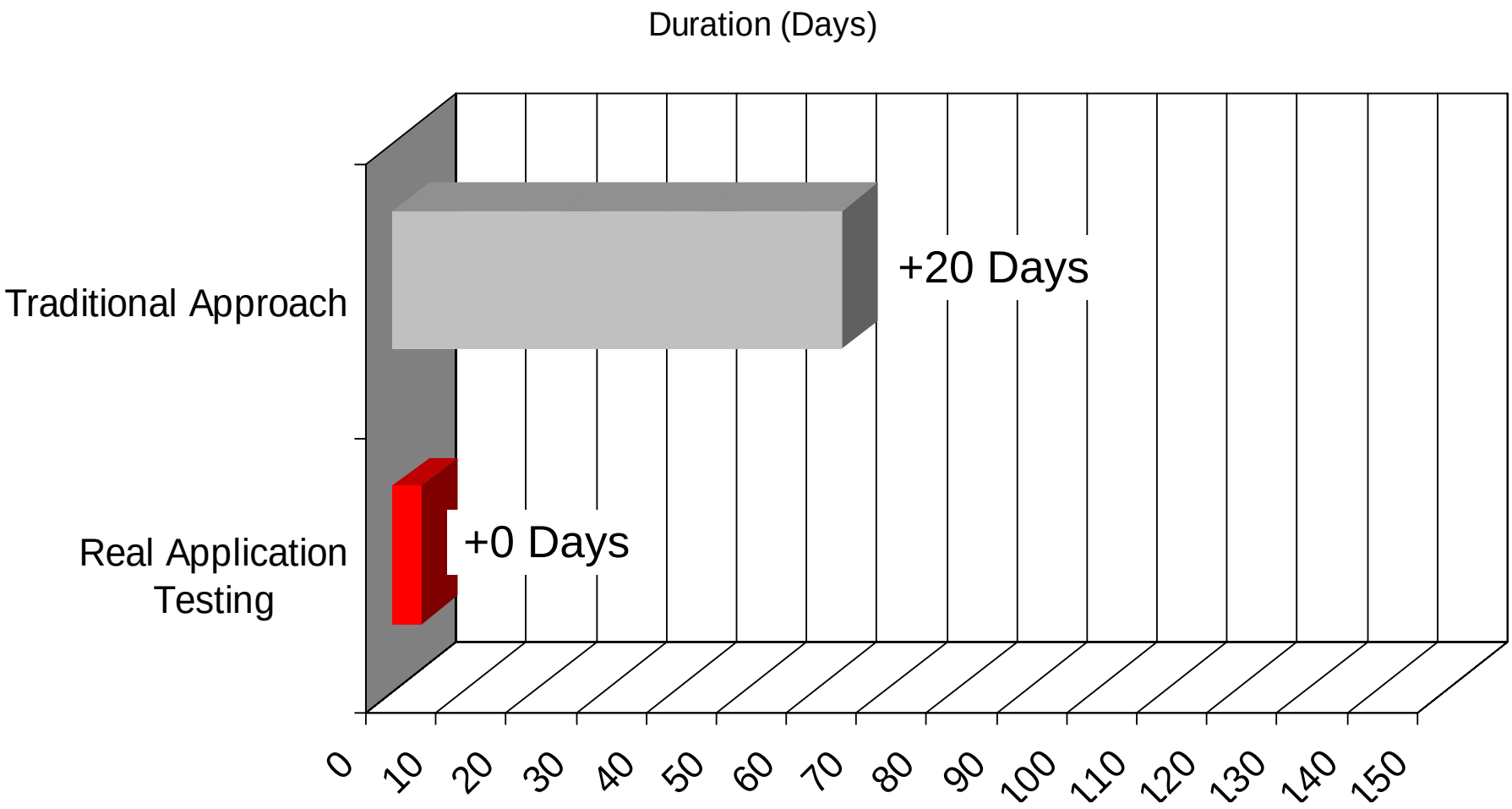
1: Install & Setup Test System



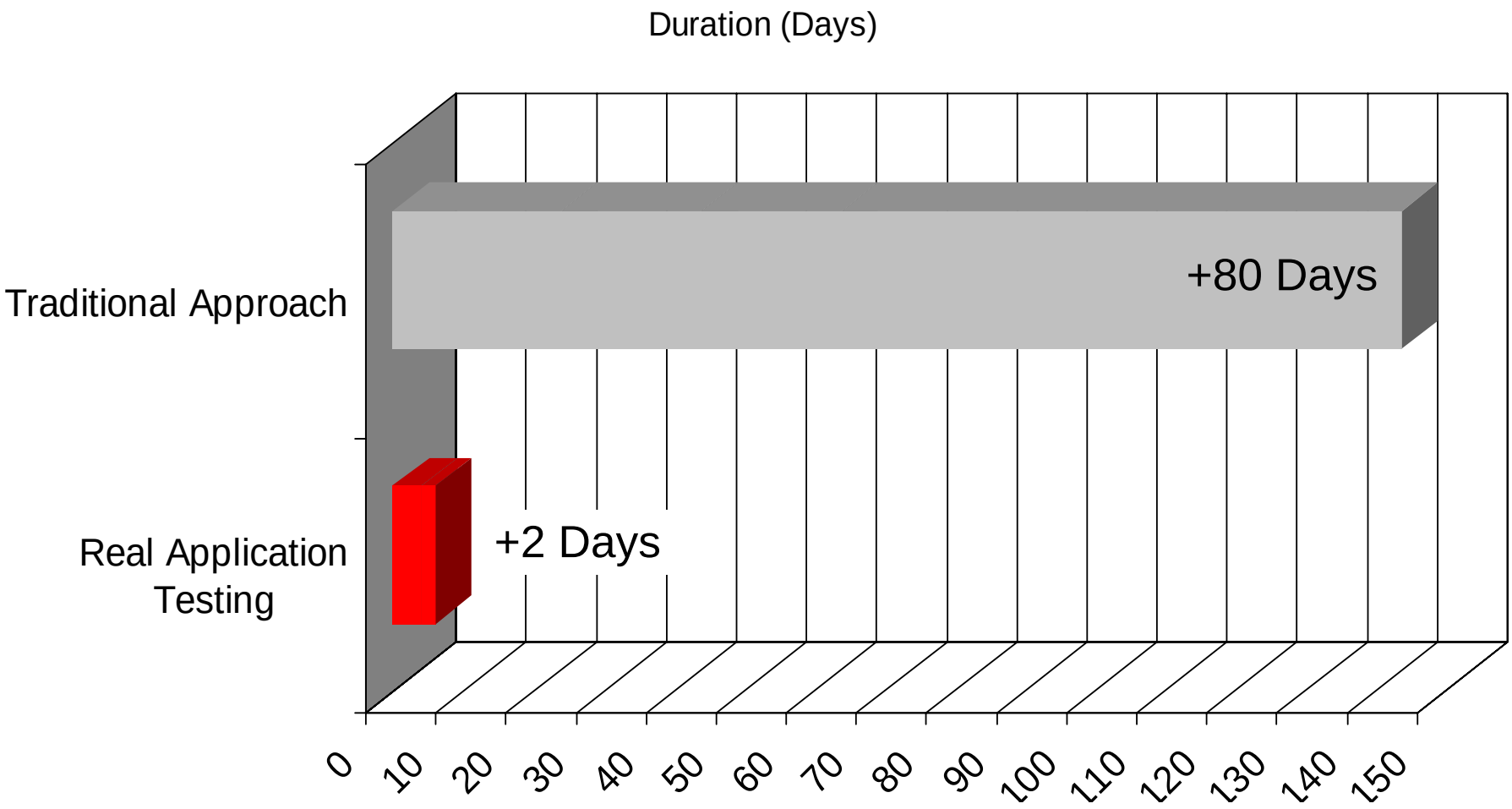
2: Understand Application Usage



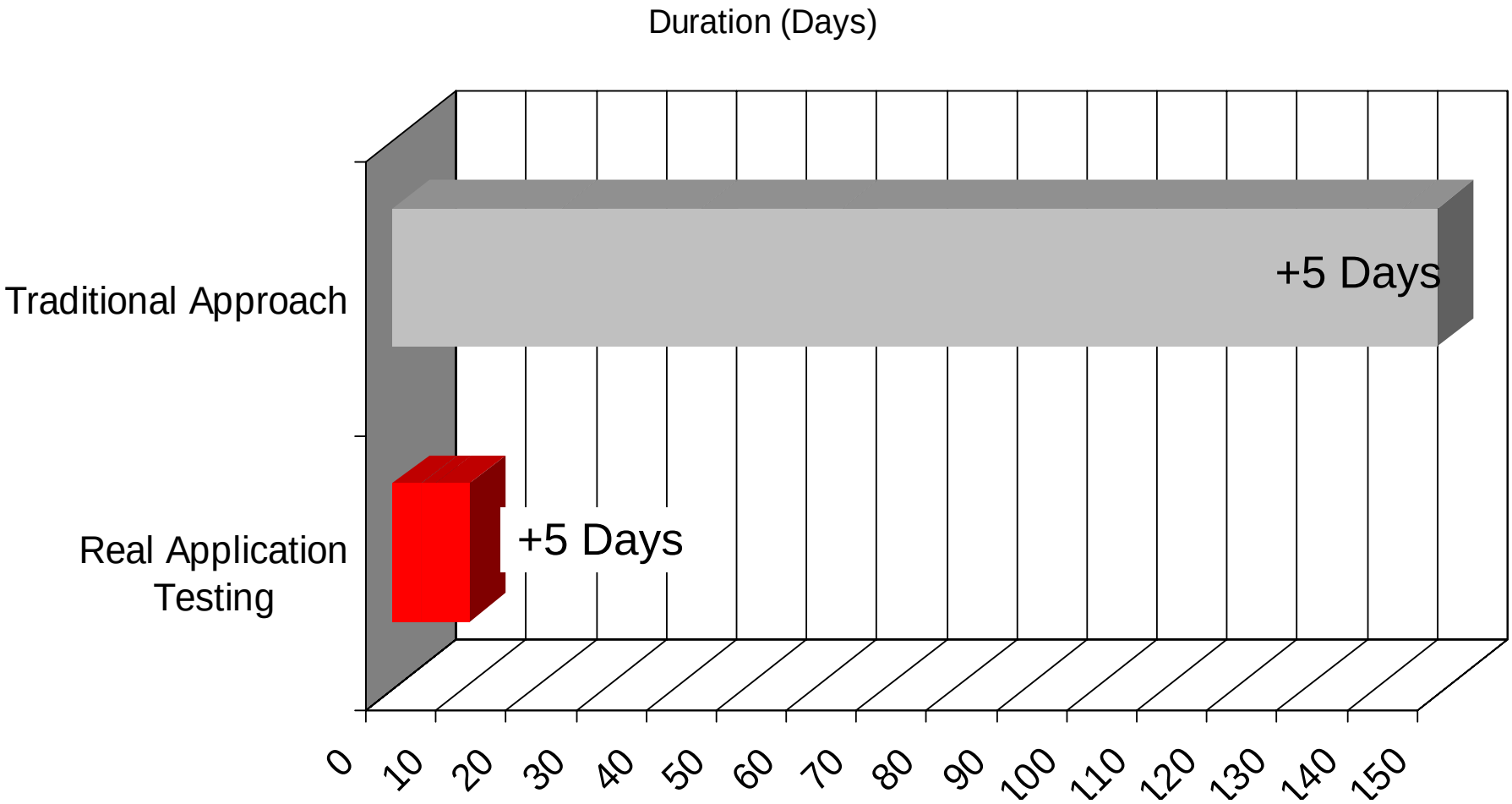
3: Identify Key Transactions



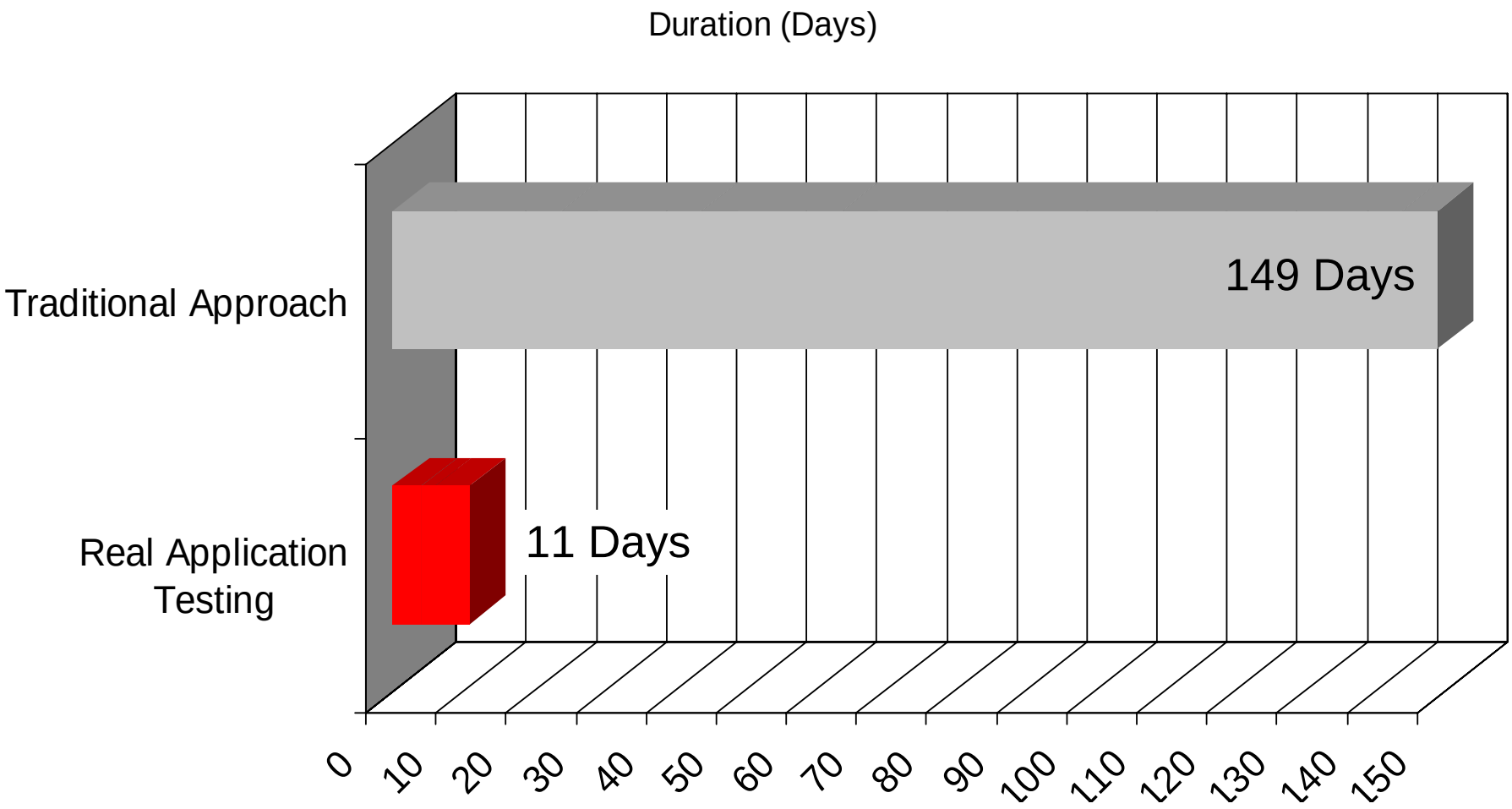
4: Generate Workload



5: Run Test Workload



Innovate Faster



Innovate Faster

- Integrate enterprise information
- Manage the information lifecycle
- Meet service level objectives
- Lower IT costs
- Manage change with confidence

ORACLE® DATABASE 11g