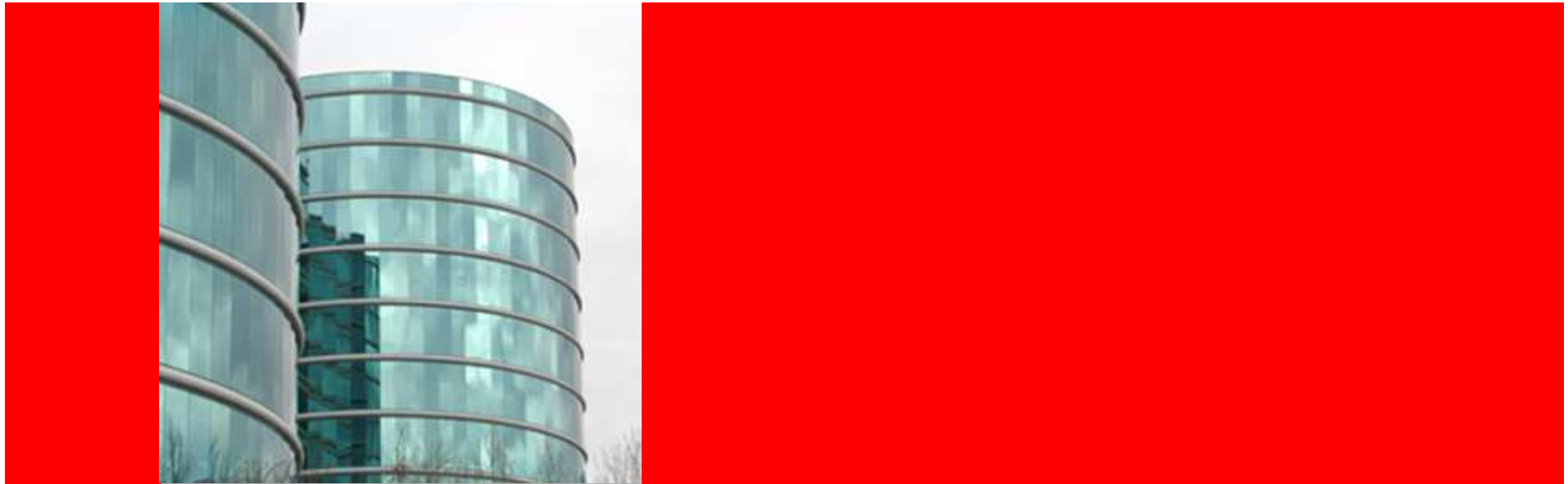




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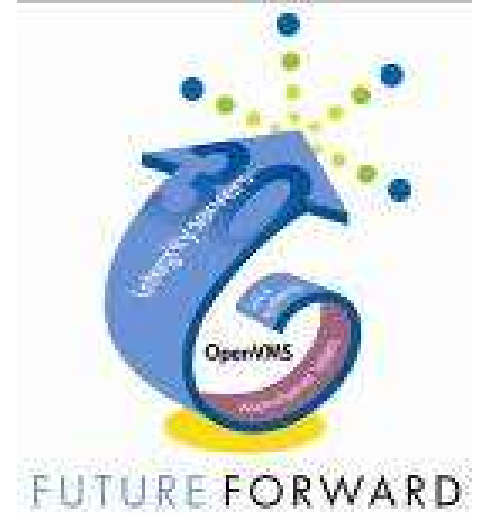
Oracle Rdb Release 7.2, 7.2.1, 7.2.2, 7.2.3, 7.2.4

Norman Lastovica and Ian Smith
Oracle OpenVMS Development Team

13 October 2009

Agenda

- Rdb V7.2
- Itanium migration
- V7.2 releases features





Rdb 7.2 Product Family on Alpha & Integrity

Oracle Rdb
Oracle CODASYL DBMS
Oracle CDD/Repository
Oracle SQL/Services
OCI Services for Oracle Rdb
Oracle Trace for Rdb
Replication Option for Rdb
Oracle Rdb ODBC Driver
Oracle Rdb JDBC Drivers
Oracle Rdb OEM Agent



Rdb V7.2 Product Family on Alpha & Integrity

- Full range of certified HP AlphaServer and HP Integrity server configurations
 - Desk-top to enterprise
 - Standalone or clustered environments



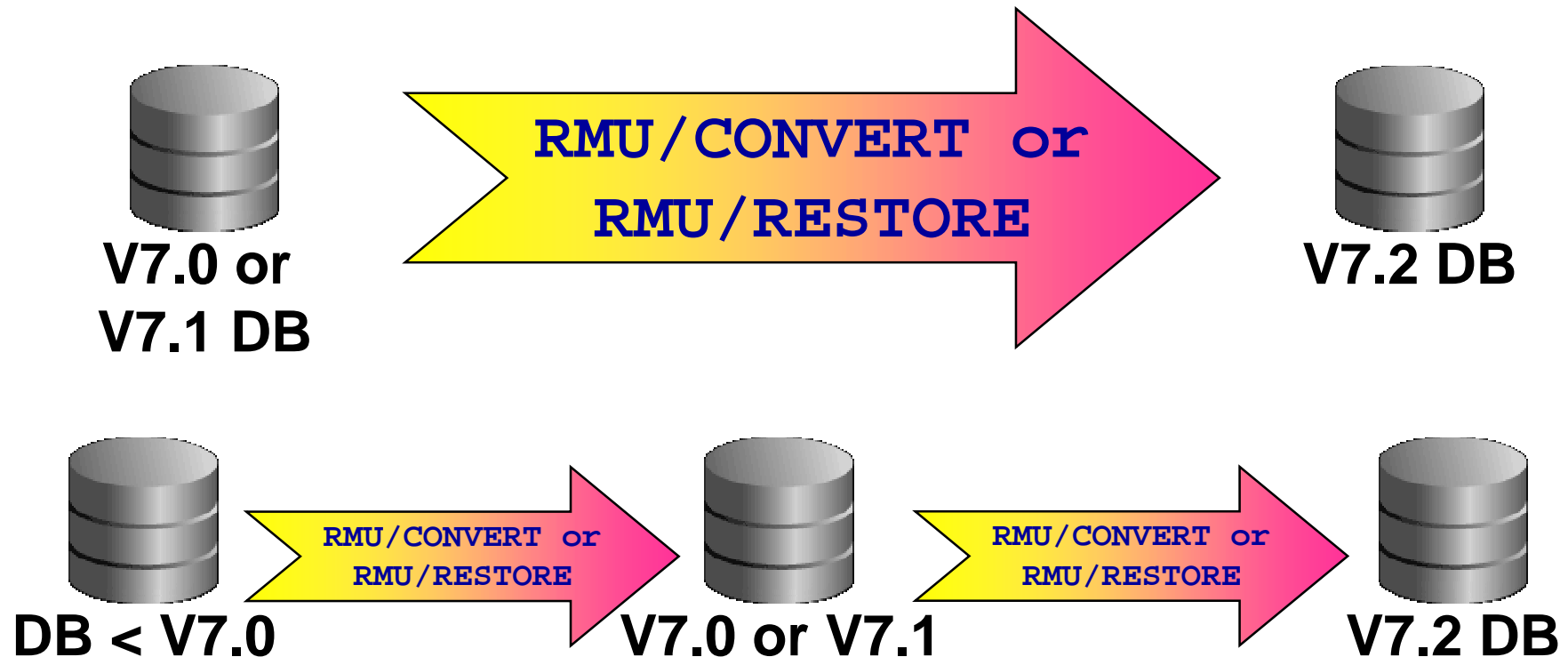
Rdb 7.2 & OpenVMS

- Databases & application clustered with existing Alpha systems running Rdb 7.2
- OpenVMS on HP Integrity version 8.2-1 or later
 - V8.3-1H1 very strongly recommended
- OpenVMS on Alpha version 8.2 or later
 - V8.3 very strongly recommended

Database Convert and Migrate to Rdb V7.2



Database Convert Paths



➤ Database convert or restore

- V7.1 or V7.0 directly to V7.2
- Prior to V7.0 - first to V7.0 or V7.1 & then to V7.2
- RMU/CONVERT takes seconds to run

➤ No application recompile/relink when on same platform

Database Convert Paths

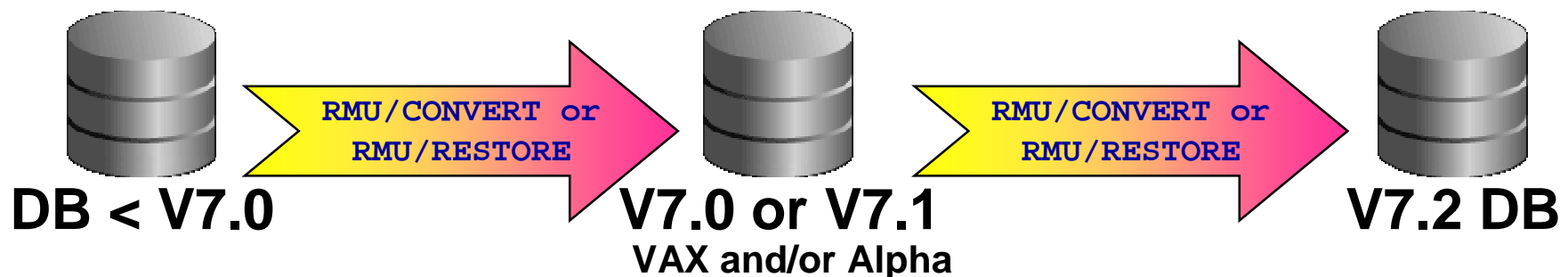
V7.0 or V7.1 Directly to V7.2



- Database convert or restore
 - V7.1 or V7.0 directly to V7.2
 - RMU/CONVERT takes seconds to run
- No application recompile/relink when on same platform

Database Convert Paths

Prior to V7.0 – First to V7.x then to V7.2



➤ Database convert or restore

- Prior to V7.0 - first to V7.0 or V7.1 & then to V7.2
- RMU/CONVERT takes seconds to run

➤ No application recompile/relink when on same platform

Alternate Database Convert Paths



- Database export and then import
 - Takes longer than unload/load in parallel
 - Requires disk space to hold export file
 - Pretty much “any version / any platform ” to V7.2

Alternate Database Convert Paths



➤ V7.0 or 7.1 Any platform to V7.2

Alternate Database Convert Paths



1. RMU /EXTRACT then SQL CREATE DATABASE ... or SQL EXPORT NODATA then SQL IMPORT to create database
2. Drop constraints, indexes, triggers, etc
3. Unload all tables in parallel from old database
4. Load all tables in parallel to new database
5. Create indexes / constraints / triggers / etc

➤ Database unload / load

- Likely faster than export/import (but more complexity)
- May require disk space to hold unload files
- Pretty much “any version / any platform” to V7.2

Alternate Database Convert Paths



➤ LogMinerLoader

- Alternative method to drastically reduce downtime
- Combination of several techniques
- Real-time data moving from old to new database
- Extremely short outage at production switch-over

Alternate Database Migration Paths

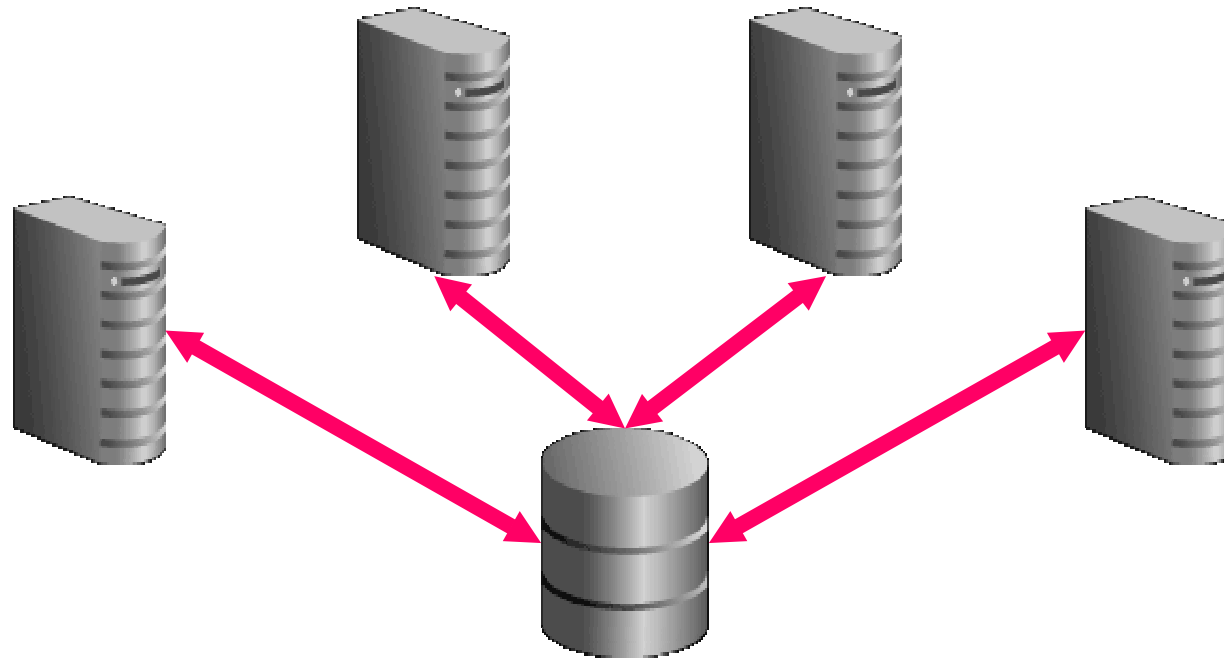


- **Hot Standby**
 - Requires identical versions of Rdb
 - Up-to-the-second consistent
 - Databases anywhere on the planet

Clustering

Rdb 7.2

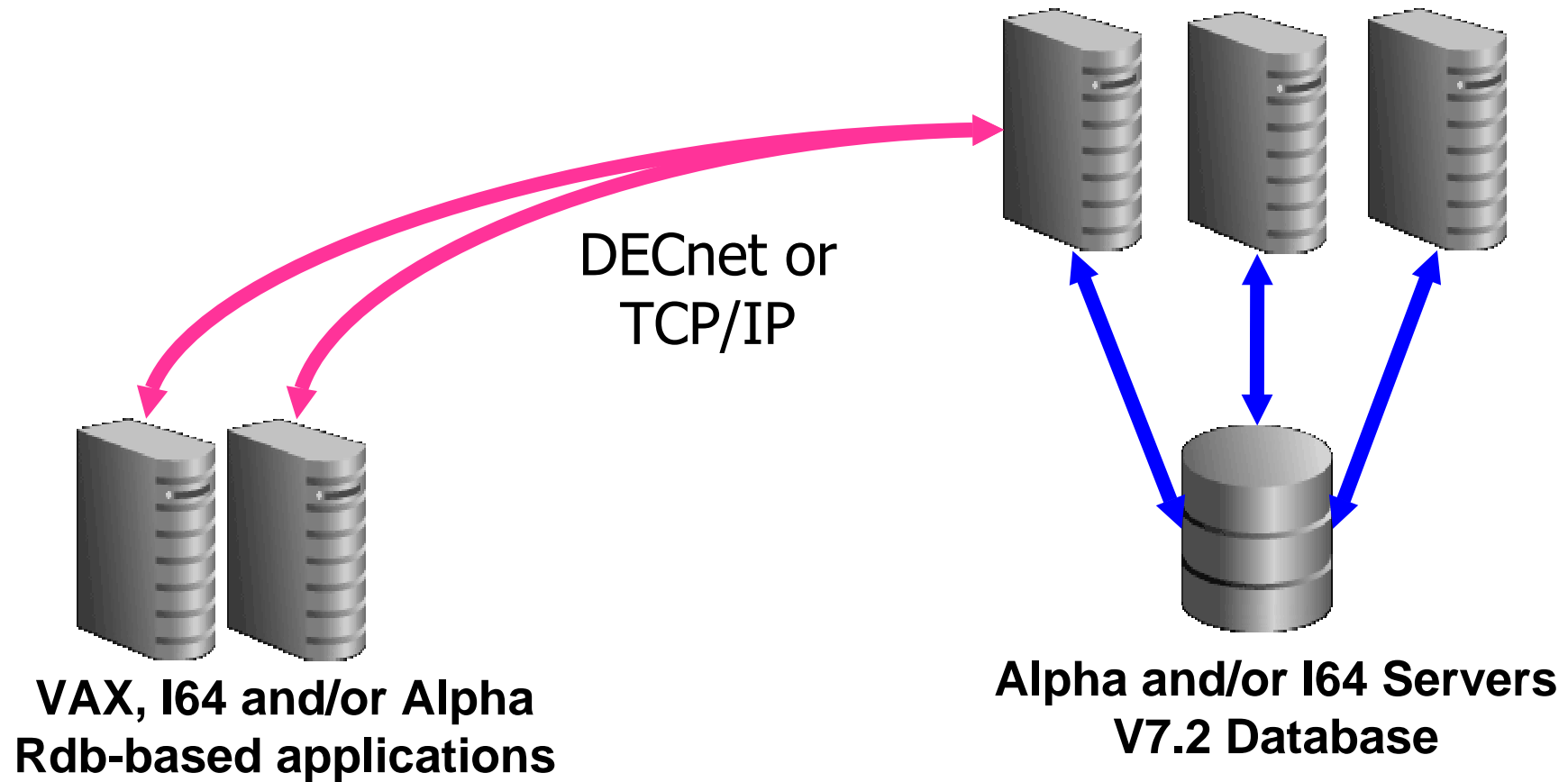
Clustered Alpha and/or I64 Servers up to 96 nodes



Rdb V7.2 Database

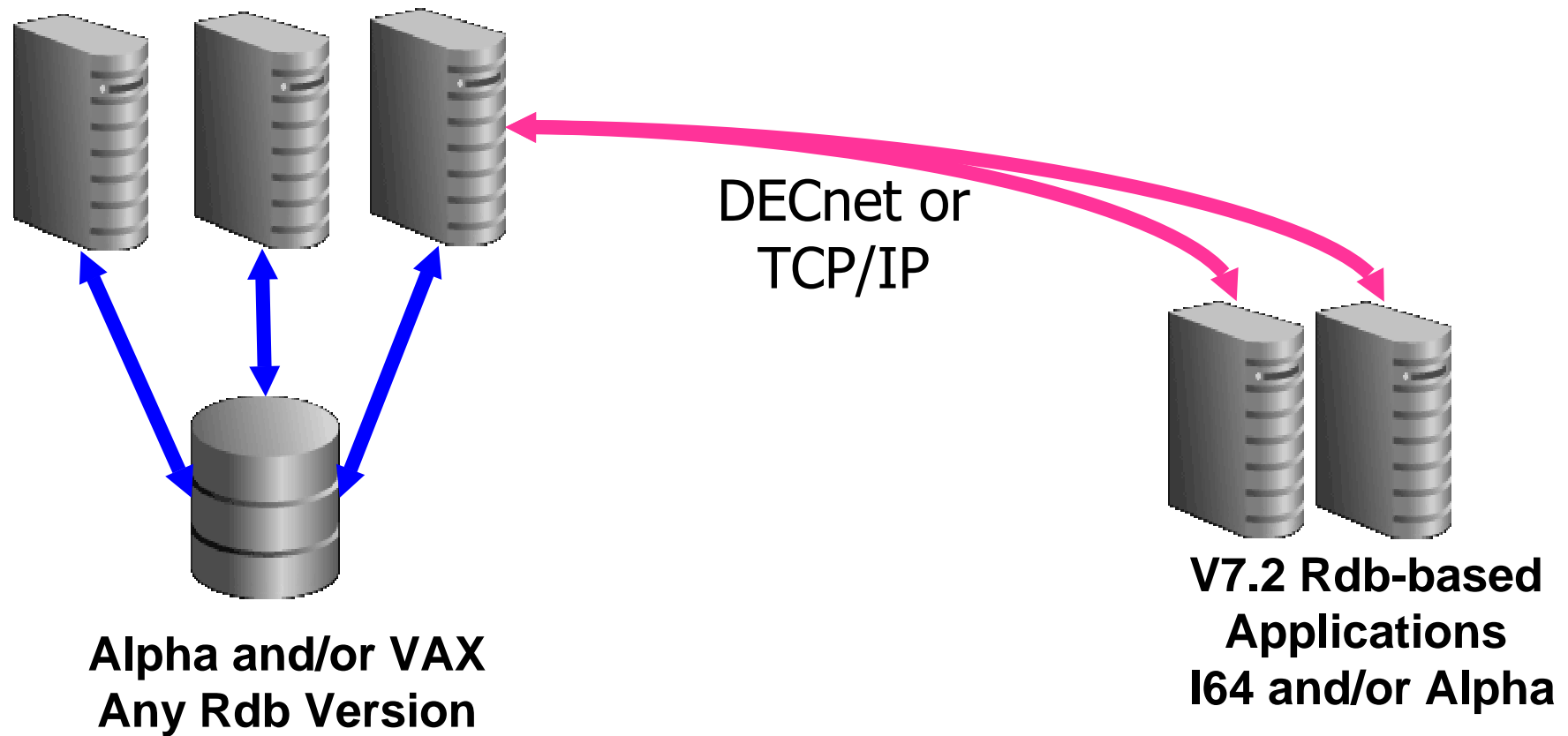
➤ **Active-active direct access from I64 and Alpha**

Remote Network Access to Rdb 7.2 Database



- Built-in network server between versions/platforms
- Multiple versions of Rdb installed & running on a system

Remote Network Access to Older Rdb Database



- Built-in network server between versions/platforms
- Multiple versions of Rdb installed & running on a system

Porting Applications





Porting Applications

- Expect “Compile & Go”
- Review build procedures
 - Command line switches
 - Alpha/VAX choices
 - Only one module has database connect default
- Review code for Alpha or VAX specific assembly



Porting Applications

- Upgrade Alpha compilers today
 - Use /WARNINGS
 - Use /CHECK during development/debug
- Start out using latest...
 - VMS (ie V8.3-1H1 & all available patches)
 - Rdb (ie V7.2.4)
 - Compilers



Floating Point & Integrity

- Rarely performance concern in database applications
- I64 hardware supports IEEE floating point
 - VAX floating point support emulated in software
- Precompilers support IEEE on Alpha & I64
 - “If in doubt, test it out” – anonymous
- Make sure all modules use same /FLOAT
 - SQL\$PRE / SQL\$MOD & language compilers



Mario Andretti

“If everything seems under control, you're
just not going fast enough”

Performance is Excellent



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Performance

- Rdb 7.2 dramatic performance gains on Alpha & I64
- I64 performance vs. Alpha
 - In some cases significantly better
- Multi-core & multi-thread advantages
- Higher clock rates & larger caches
- Performance per \$ is significantly improved



What Our Customers Are Saying



Bill Wright
Oracle Corporation

“It takes more than foul language
to improve performance”



J.H.
Ohio

“...I just blasted 15,000+ accounts
through billing in 3 minutes.
That’s 5,000 accounts per minute!!
At peak we were doing 1200 on the
Alpha!!”



S.A.
Tokyo

“...customer recently measured the performance to compare current their system with Rdb7 and the next system with 7.2.1 / IA64, the next system is three times faster than current one.”

V7.2 Features Overview





7.2 Features

Increased Limits - IO Related Sizes

	<u>< 7.2</u>	<u>7.2</u>
IO Maximum	127 Blocks	256 Blocks
Buffer Size Maximum	63 Blocks	128 Blocks
Page Size Maximum	32 Blocks	63 Blocks
Global Buffers Maximum	524,288	1,048,576
Sort Work IO	127 Blocks	1024 Blocks



7.2 Features

- Index node pre-fetch optimizations
- Transaction rollback optimizations
- Caching of database AIP entry information
- VMS file caching disabled for backup operations
- Constant boolean selections recognized
 - Executed prior to fetching matching rows



7.2 Features

- Queries against RDB\$DATABASE optimized
 - Now implicitly adds WHERE DBKEY = _DBKEY'...'
- DATA DEFINITION mode extended to more DDL statements
- In prior releases, if user deleted rows, other users would not reuse space
 - Free space location for uniform areas now tracked in shared memory



7.2 Features

RMU

- RMU/SHOW STATISTICS
 - 64-bit counters
 - Additional statistics screens
 - Sequential scan added to record statistics screen
- Absolute & Delta time accepted for RMU qualifiers
- RMU/UNLOAD supports TRIM for delimited files
- Encrypted database & after-image journal backups for protection of confidential data



7.2 Features SQL

- LIMIT TO ...SKIP syntax
 - Precursor to new SQL syntax (see FETCH FIRST later)
- SHOW STATISTICS command



7.2 Features

Increase Memory Related Quotas

- Executable images typically 2x to 4x larger
- Larger internal buffers
- Larger I/O

V7.2.1 Features Overview





7.2.1 Features

- Vastly improved compression for RMU /BACKUP
- Compression support for RMU /UNLOAD & /LOAD
- Improved I/O behavior for RMU /BACKUP, /COPY & /MOVE
- RMU /SHOW AIP
- RMU /SET AIP



7.2.1 Features

- Most run-time durations captured more precisely
 - Improved precision with IO, lock & transaction durations
- Record length on AIP updated at ALTER TABLE action that changes on-disk length
 - May require subsequent RMU action to update SPAM fullness values
- New CONCAT implementation
 - Now function based (was binary now support n parameters)
 - Better performance – especially for Oracle dialects

V7.2.2 Features Overview





7.2.2 Features

- Intel Itanium Processor 9100 “Montvale” support
- Reduced executable image sizes, reduced CPU usage, improved performance
- SET FLAGS keyword to control optimization level
 - SET FLAGS ‘OPTIMIZATION_LEVEL(TOTAL_TIME)’



7.2.2 Features

- /ABMS_ONLY qualifier to dump ABM pages
- RMU /BACKUP performance enhancements
- RMU /SET SERVER /NOOUTPUT
- RMU /RESTORE allow change of page size for uniform format storage areas

V7.2.3 Features Overview





7.2.3 New Features

- Run-time native compiler on I64 enabled by default
- SQL precompiler & module language compiler
/ARCHITECTURE command line qualifier
- PERFT4_RDB example program
- Temporary table improvements
 - Better use of 64 bit memory
 - No longer use logical RDMS\$TTB_HASH_SIZE to tune



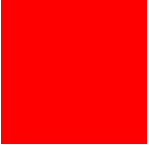
7.2.3 New Features

- FETCH FIRST clause from SQL Standard (alternate to LIMIT TO clause)
- OFFSET clauses for select expression from SQL standard (alternate to SKIP clause)
- SIGN built-in function
- Enhanced simple CASE expression
- ALTER INDEX now activates the MAINTENANCE IS ENABLED DEFERRED clause



7.2.3 New Features

- RMU load no longer quietly truncates string data during insert
 - New /DIALECT qualifier
 - Dialect defaults to SQL99, but can choose any
- RMU Unload SQL*Loader control files
 - New CONTROL keyword for FORMAT
 - Generate SQL*Loader description file



7.2.3 SQL

- New SQL functions
 - ACOS, ASIN, ATAN, ATAN2, BITAND, ATANH, ACOSH, ASINH and COT
- Correlation name support for INSERT
- Correlation name optional for derived tables
- New Interactive SQL statements
 - SET TIMING, SET FEEDBACK, SET PAGESIZE, SET LINESIZE

V7.2.4 Features Overview





7.2.4 New Features

- Date/time arithmetic enhancements
 - Assignment rules simplified for DATE VMS
- DEFAULT PROFILE feature
- RMU /DUMP /BACKUP /OPTIONS=ROOT /HEADER_ONLY
 - Displays only header information
- GET ENVIRONMENT supports SQLCODE and SQLSTATE capture



7.2.4 New Features

- Timestamp added to some messages for RMU LOAD & UNLOAD
- New SET SQLDA statement
- RMU /SHOW VERSION displays system architecture and version
- IDENT option for SQL module language PRAGMA and precompiler DECLARE MODULE



SET SQLDA

- New SET SQLDA statement
 - NAMED MARKERS – markers look more like local variables (implicitly declared and used multiple times)
 - INSERT RETURNING – now places RETURN values in OUTPUT SQLDA
 - PADDING ... CHARACTERS
 - ROWID TYPE – allow applications to detect renamed (AS) DBKEY or ROWID references



Ann McQuaid
general manager, HP OpenVMS

“We are delighted that Oracle has strengthened its commitment to OpenVMS on HP Integrity servers. We are extremely pleased about our continued long-term relationship, delivering some of the industry's most robust, available and secure solutions to support the dynamic and critical needs of customers.”

Summary


- Itanium migration is easy
- Performance is excellent
- Rdb V7.2 features benefit users, applications & DBAs






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