Oracle Rdb
Release 7.2 & 7.2.1

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Oracle Rdb Engineering

`www.oracle.com/rdb`
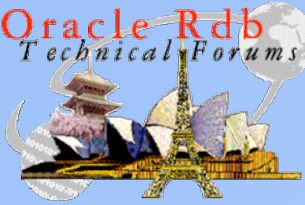
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*"For decades, our customers have relied on Oracle Rdb to support large-scale production applications and high-performance transaction processing on HP OpenVMS systems. The latest release extends the quality and stability for which Oracle Rdb is known, while providing customers with more choice and the flexibility to easily move to lower cost systems."*

- Steve Hagan, vice president, Oracle Server Technologies

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Overview of Rdb 7.2

- HP Integrity Servers (aka Itanium, IA64)

- Minor features, enhancements & optimizations
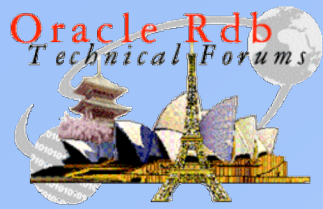
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Rdb Product Family on Integrity

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

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Rdb 7.2 & Integrity

- Supports full range of HP Integrity server configurations

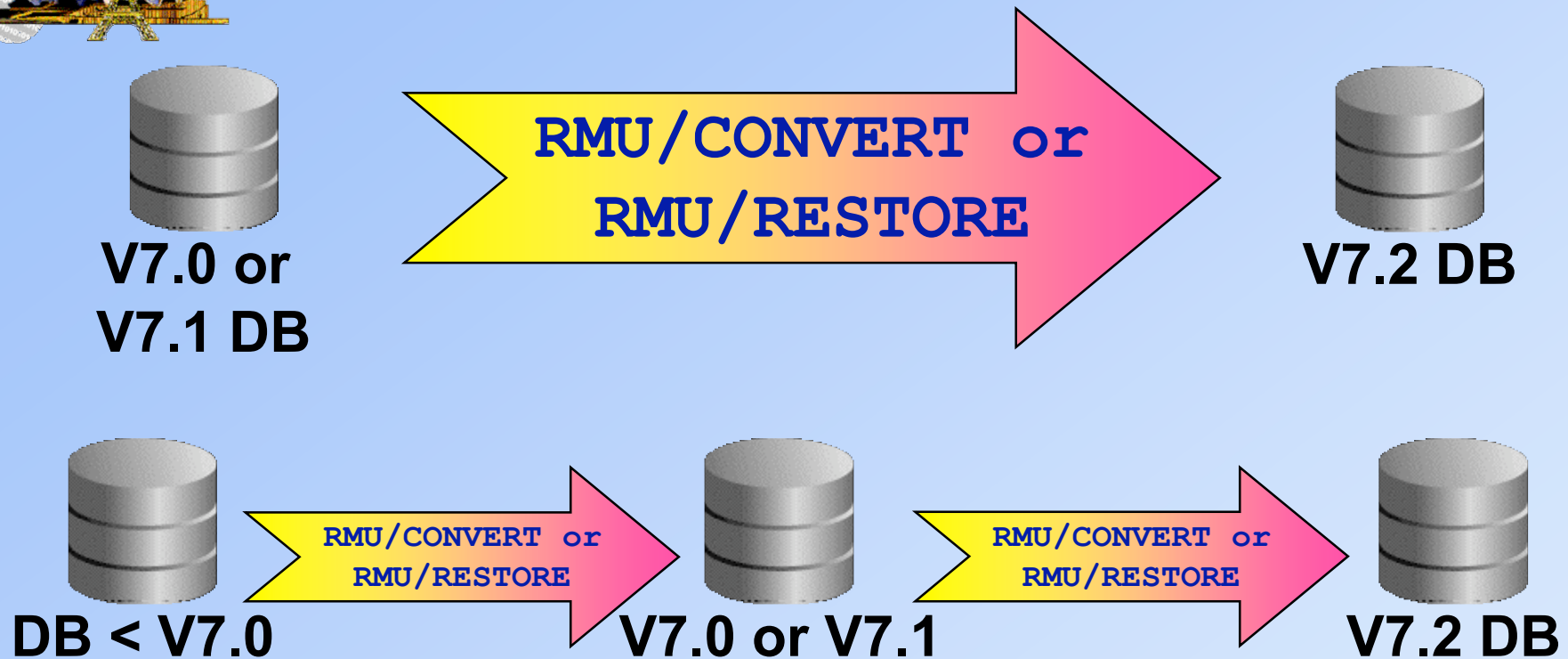- Databases & application clustered with existing Alpha systems running Rdb 7.2

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Rdb 7.2 & OpenVMS

- OpenVMS on HP Integrity version 8.2-1

- OpenVMS on Alpha version 8.2

Database Convert Paths

RMU/CONVERT or RMU/RESTORE

V7.0 or V7.1 DB → V7.2 DB

DB < V7.0 → **RMU/CONVERT or RMU/RESTORE** → V7.0 or V7.1 → **RMU/CONVERT or RMU/RESTORE** → V7.2 DB
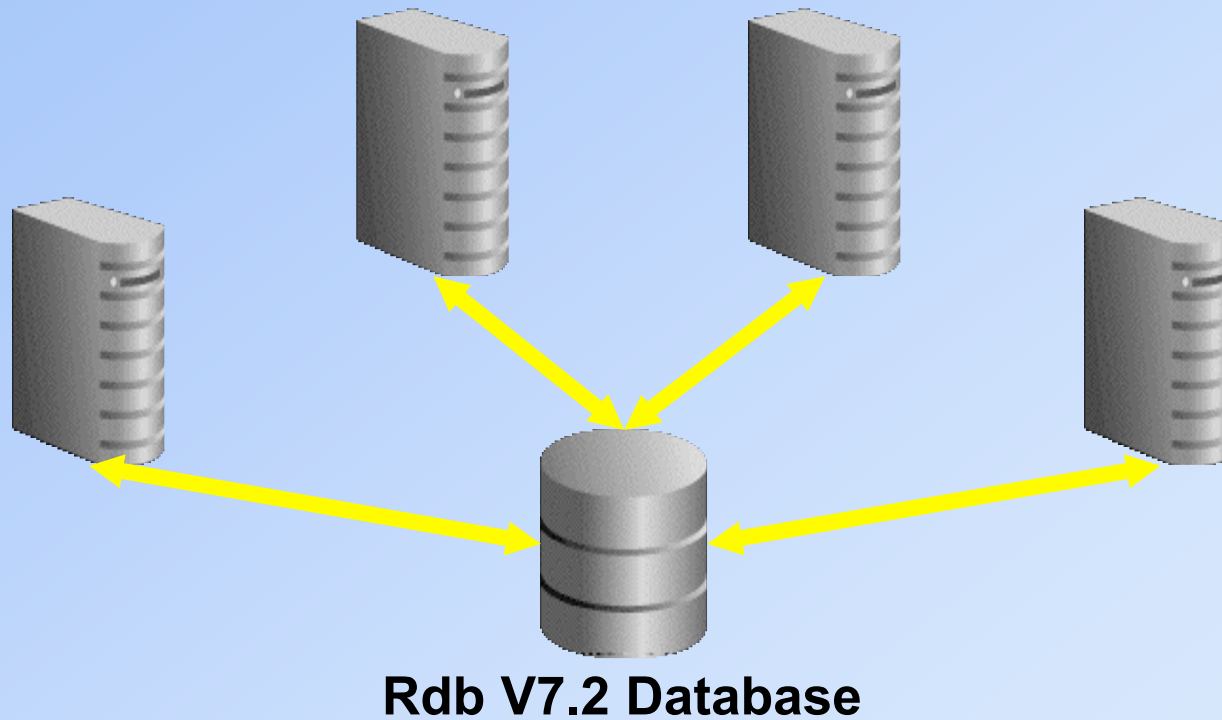
➢ **Database convert or restore**
- **V7.1 or V7.0 directly to V7.2**
- **Prior to V7.0 - first to V7.0 or V7.1 & then to V7.2**
- **RMU/CONVERT takes seconds to run**

➢ **No application recompile/relink when on same platform**

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Clustering
Rdb 7.2

Clustered Alpha and/or I64 Servers

Rdb V7.2 Database

➢**Clustering allows direct access from I64 or Alpha**

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Remote Network Access to Rdb 7.2 Database

DECnet or
TCP/IP

**VAX, I64 and/or Alpha
Rdb-based applications**

**Alpha and/or I64 Servers
V7.2 Database**
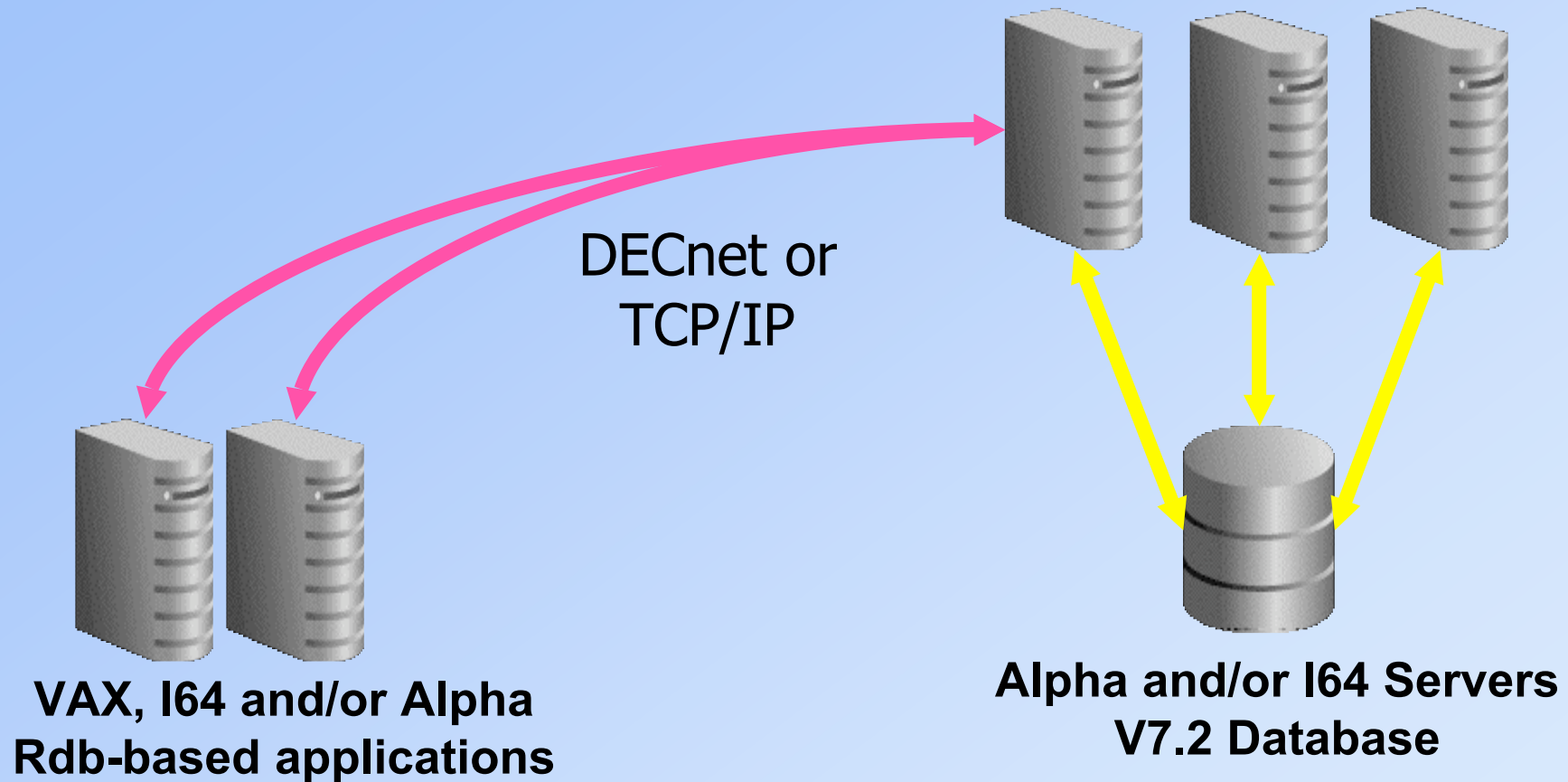
➢**Built-in network server between versions/platforms**
➢**Multiple versions of Rdb installed & running on a system**

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Remote Network Access to Older Rdb Database

DECnet or
TCP/IP

**Alpha and/or VAX
Any Rdb Version**

**V7.2 Rdb-based
Applications
I64 and/or Alpha**

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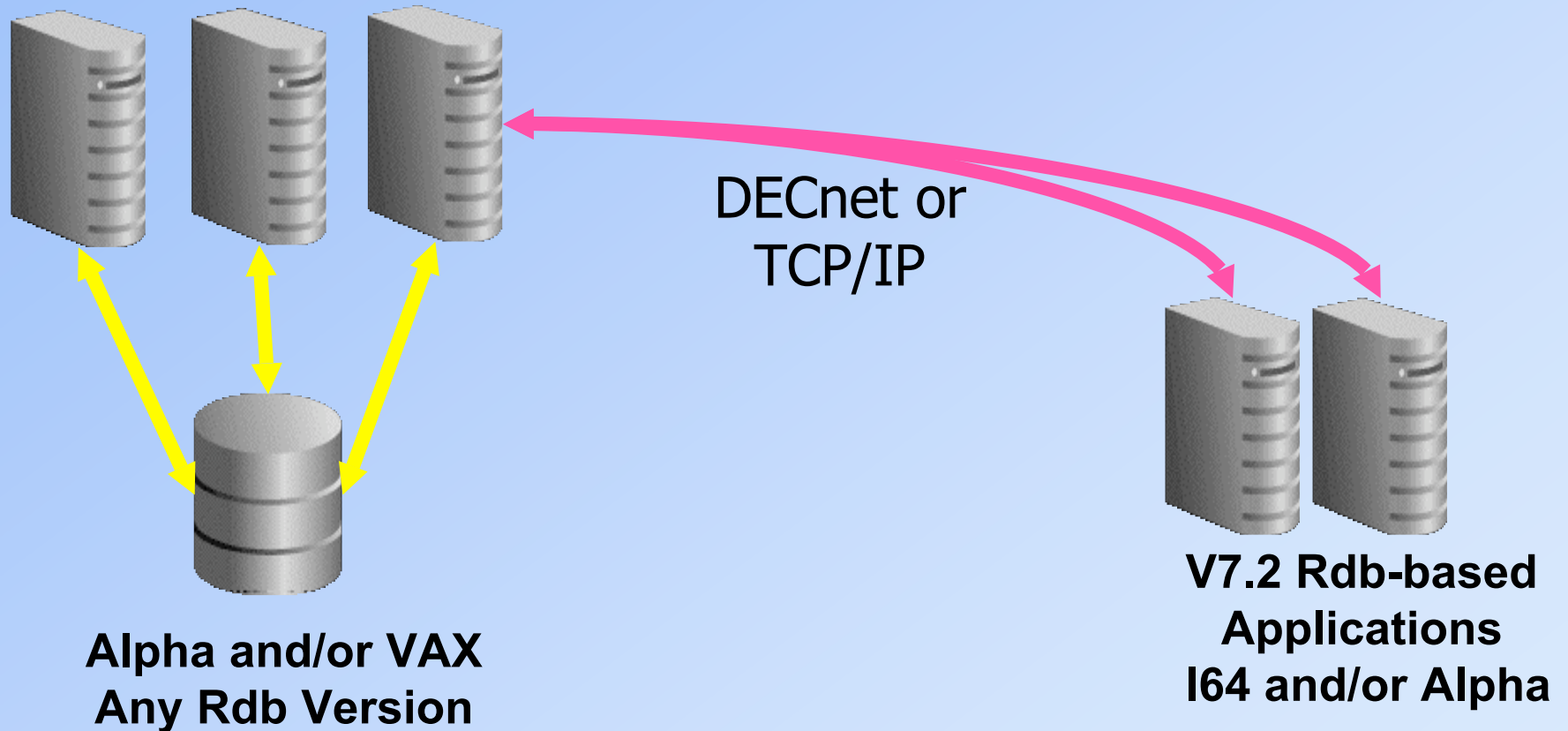
Porting Applications

- Expect "Compile & Go"

- Review build procedures
  - Command line switches
  - Alpha/VAX choices

- Upgrade Alpha compilers today
  - Use /WARNING & /CHECK

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Porting Applications, continued

- Review source code for Alpha or VAX specific assembly

- Macro (machine or assembler) language

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Floating point & Integrity

- 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
  - SQLPRE / SQLMOD & Language compilers

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Porting: More Difficult Issues

- Linking /SYSEXE

- Inner (ie, non-user) modes

- Knowledge of call stack formats, exception frames, PTE, PFN, PC, FP, AP

- Strict floating point behavior requirements

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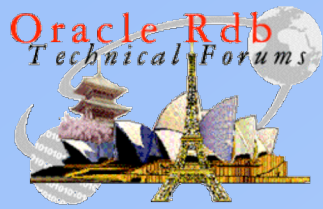
7.2 Features
Increased Limits

- …Global buffers to 1048576
- …Database page to 63 blocks
- …Buffer size limit to 128 blocks

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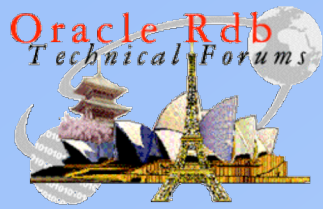
7.2 Features
Performance

- Index node pre-fetch optimizations

- Transaction rollback optimizations

- Caching of database AIP entry information

- VMS file caching disabled for backup operations

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7.2 Features
Performance

- Constant boolean selections recognized

```
SQL> SELECT * FROM EMPLOYEES WHERE 1 = 2;
```

- Queries against RDB$DATABASE optimized

```
SQL> SELECT {some datum} FROM RDB$DATABASE;
```

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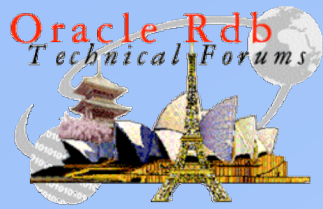
7.2 Features
Performance

- Index column group now enabled by default

- Refined index estimation enabled by default

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7.2 Features
Space Reclamation

- In prior releases, if user deleted rows, other users would not reuse space

- Free space location for uniform areas now tracked in shared memory

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7.2 Features
RMU/SHOW STATISTICS

- 64-bit counters

- Additional statistics screens

```
Node: RANDM4 (1/1/16)  Oracle Rdb V7.2-011 Perf. Monitor 28-APR-2006 13:13:15.81
Rate: 3.00 Seconds           Rdb Executive Statistics         Elapsed: 20:52:25.59
Page: 1 of DISK$RANDOM_SYS:[RDB_RANDOM.PMEAD.INSERTTEST]TESTDB.RDB;1Mode: Online
--------------------------------------------------------------------------------

statistic........        rate.per.second............ total...... average......
name.............        max..... cur..... avg....... count....... per.trans....
queries compiled           0        0        0.0          10              1.2
index scans                0        0        0.0           6              0.7
  index only               0        0        0.0           0              0.0
  index full               0        0        0.0           0              0.0
dynamic optimizer          0        0        0.0           2              0.2
  one abandoned            0        0        0.0           0              0.0
  all abandoned            0        0        0.0           0              0.0
```

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7.2 Features
RMU/SHOW STATISTICS

- Sequential Scan added to Record Statistics screen

```
Node: RANDM4 (1/1/16)   Oracle Rdb V7.2-011 Perf. Monitor 28-APR-2006 13:33:01.34
Rate: 3.00 Seconds                Record Statistics              Elapsed: 21:12:11.12
Page: 1 of DISK$RANDOM_SYS:[RDB_RANDOM.PMEAD.INSERTTEST]TESTDB.RDB;1Mode: Online
-----------------------------------------------------------------------------------

statistic........        rate.per.second............ total...... average......
name.............        max..... cur..... avg...... count....... per.trans....
.
.
.
sequential scan                   0        0       0.0              0          0.0
  record fetched                  0        0       0.0              0          0.0
```

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7.2 Features
RMU Time Qualifiers

- Absolute & Delta time accepted for qualifiers

```
$ RMU/SHOW STATISTICS/NOINTER/OUT=STATS/UNTIL="+1:0:0" DB


$ RMU/SHOW STATISTICS/NOINTER/OUT=STATS/UNTIL=TOMORROW DB
```

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7.2 Features
Encrypted Backups

- Encrypted database & after-image journal backups for protection of confidential data

```
$ RMU/BACKUP/ENCRYPT=(VALUE="My secret key") -
    MYDB.RDB MYBACKUP.RBF


$ RMU/RESTORE/ENCRYPT=(VALUE="My secret key") -
    MYBACKUP.RBF


$ ENCRYPT /CREATE_KEY /LOG HAMLET -
    "And you yourself shall keep the key of it"
%ENCRYPT-S-KEYDEF, key defined for key name = HAMLET
$ RMU/BACKUP/ENCRYPT=NAME=HAMLET MYDB.RDB MYBACKUP.RBF
```

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7.2 Features
New LIMIT TO Syntax

- The 100th employee from EMPLOYEES:

```
SQL> select last_name, first_name, employee_id
cont> from employees order by employee_id
cont> limit to 1 skip 99 rows;
 LAST_NAME          FIRST_NAME     EMPLOYEE_ID
 Herbener           James          00471
1 row selected
```

- The last row in a sorted list:

```
SQL> select last_name, first_name, employee_id
cont> from employees order by employee_id
cont> limit to 1
cont> skip (select count(*)-1 from employees) rows;
 LAST_NAME          FIRST_NAME     EMPLOYEE_ID
 Herbener           James          00471
1 row selected
```

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Increase Memory Related Quotas

- Executable images typically 2x to 4x larger

- 7.2 uses larger internal buffers

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%ILINK-E-INVOVRINI

```
%ILINK-E-INVOVRINI, incompatible multiple
initializations for overlaid section
  section: {psect; typically a "handle"}
  module: {module with overlay}
  file: {object module}
  module: {other module with overlay}
  file: {other object module}
```

- VAX & Alpha linkers allowed multiple psect overlays with different values

- Itanium linker flags this as an error

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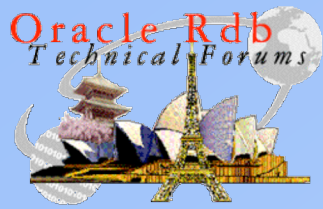
Shareable Images & PTHREAD$RTL

- If application utilizes shareable images that invoke posix threads then main image must be linked with thread RTL

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Use Same Case for External Functions

- IA64: SQL External Procedures must use same case for location or the image loader will think it is a different image.

```
create procedure sys$gettim(
   in   :timadr date vms by reference);
   external location 'SYS$SHARE:SYS$PUBLIC_VECTORS.EXE'
   language general general parameter style;
```

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7.2 Features
SQL SHOW STATISTICS

```
SQL> SHOW STATISTICS

              process statistics at 28-APR-2006 14:28:10.43
     elapsed time =   0 00:00:05.35        CPU time =   0 00:00:00.07
buffered I/O count = 104              direct I/O count = 133
   open file count = 10          file quota remaining = 19990
        locks held = 83               locks remaining = 19917
   CPU utilization = 1.3%         AST quota remaining = 196
```

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7.2.1

- Target Q1CY07

- OpenVMS V8.3 certification on Alpha & I64

- I64 Montecito-based systems
  - Multi-core
  - Multi-thread

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7.2.1 Features

- Compression support for RMU /UNLOAD & RMU /LOAD

- Vastly improved compression for RMU /BACKUP

- Improved IO behaviour for RMU /BACKUP, RMU /COPY & RMU /MOVE

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7.2.1 Features

- Most run-time durations captured more precisely
  - Improved precision with IO, lock & transaction durations

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Rdb 7.2 Retired Features

- ACE (AIJ Cache on Electronic disk)

- WORM (Write Once Read Many) Storage

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Summary

Rdb 7.2 well tested & stable

Migrating to Integrity is easy

Improved Performance

Excellent Reliability & Performance on Integrity

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*"**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.**"*

- Ann McQuaid, general manager, HP OpenVMS

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For More Information

www.oracle.com/rdb

metalink.oracle.com

www.hp.com/products/openvms

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&
A N S W E R S

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