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What is New in Oracle Rdb

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Oracle Rdb and Oracle Database on OpenVMS Engineering

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Current releases

- All customers are encouraged to upgrade their V7.3.* systems to V7.3.2(Update 2) as soon as possible.
- Customers are encouraged to install the latest Update Kit for their version, even if upgrade to the latest release isn't feasible
 - Update kits are cumulative, only need the last
- Current CDD release is V7.2.0.6.0
 - Recommended for all customers

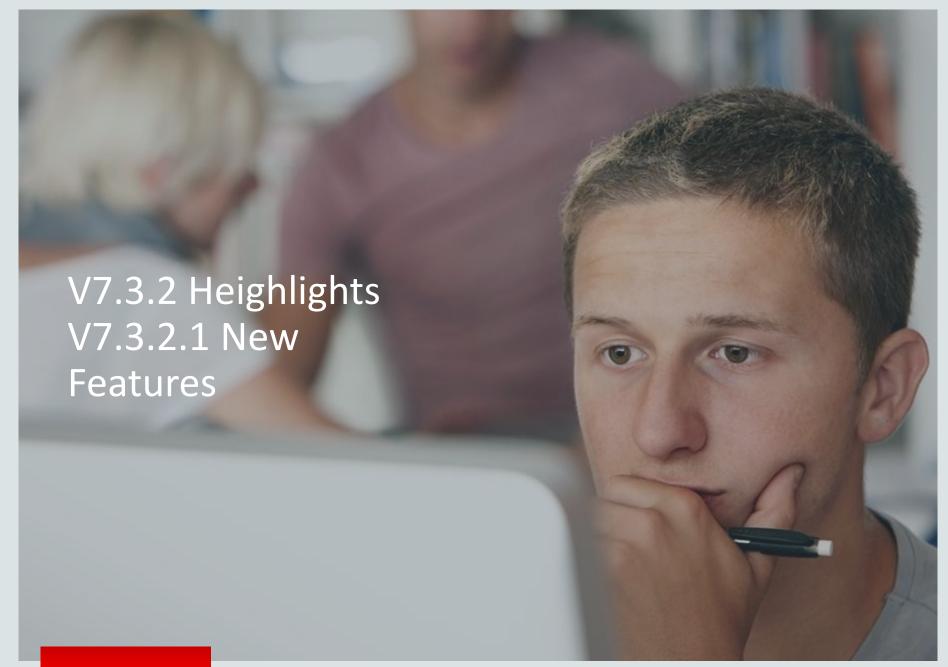


Imminent Releases

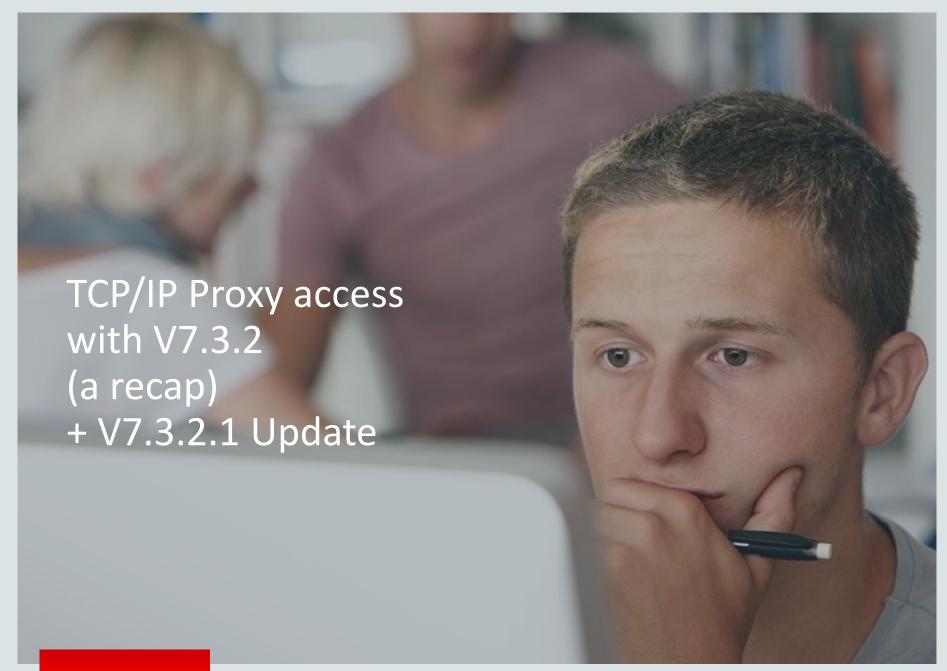
- Oracle Rdb V7.3.2.1
- Oracle SQL/Services and OCI Services 7.3.2.3
- Oracle SQL/Services and OCI Services 7.3.3.0
- ORCM 7.3.2
- Changes in these releases are the focus of this talk



Oracle Rdb: What's Under Development







TCP/IP and PROXY access

- Now support PROXY access when transport is TCP/IP
- Major architectural changes in Rdb/Dispatch layer
- Must have V7.3.2 (or later) on both client and server systems

TCP/IP and PROXY access

- Designed to allow easy move from DECnet proxy to TCPIP
- Uses OpenVMS services to access existing proxy database
- Considered using TCPIP proxy support
 - Undocumented
 - Not officially supported
 - Would required user migration of PROXY data
 - Not a 1-to-1 mapping



TCPIP Proxy

- Enabled by default
- No longer require USER or USING
- No longer require SQL_PASSWORD and SQL_USERNAME
- Can simply access remote database when SQL_NETWORK_TRANSPORT_TYPE TCPIP



TCPIP Proxy

- Preserves old behavior if remote system is older than
 7.3.2
- Also enhanced support for USER and SQL_USERNAME
 - Can place SQL_PASSWORD or SQL_USERNAME in configuration file
 - Mix and match with USER and/or USING clause
- For example:
 - Application includes USER clause in ATTACH
 - Daily password can be updated in rdb\$client_defaults.dat



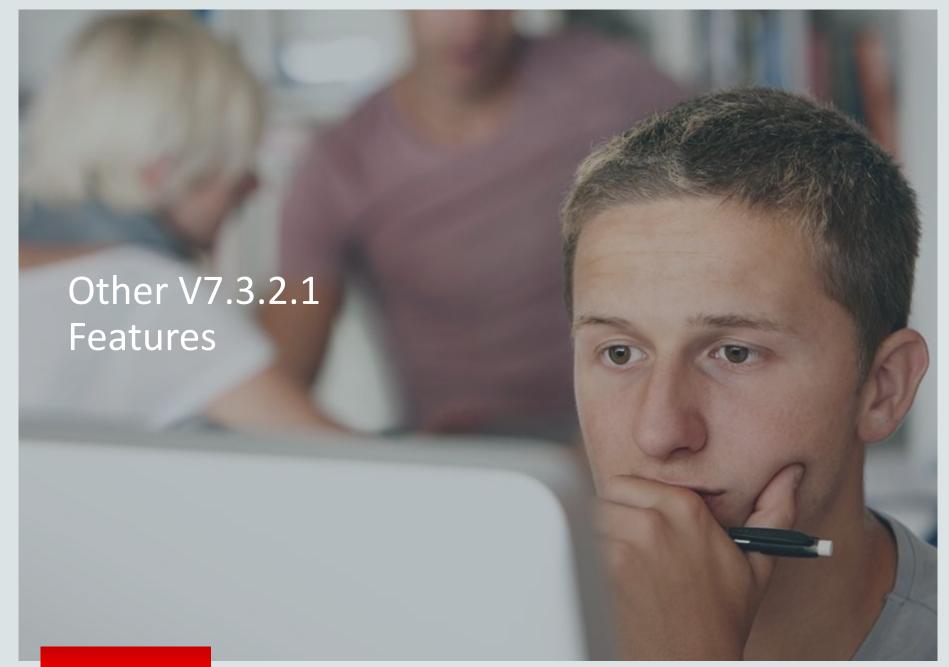
SQL_ENABLE_TCPIP_PROXY

- Can disable if not appropriate
- Add
 SQL_ENABLE_TCPIP_PROXY FALSE
 to configuration file
- Can be disabled on either client (rdb\$client_defaults.dat) or server (rdb\$server_defaults.dat)

Configuration File Enhancements

- Proxy support opened up different sorts of authentication models.
- More flexible usage of configuration files with SQL_USERNAME and SQL_PASSWORD
- For example, include the USERNAME in the configuration file
 - RDB\$CLIENT_DEFAULTS.DAT
 - SQL_USERNAME somename
- Application just provides the password
 - attach 'filename mydb USING "password" ';
- Only need half the credentials in the application and the rest can be external.







Optimizer Min Max and Count Optimizations

- Optimizer now uses Max lookup, Min lookup, and Count Scan optimizations when more than one MAX, MIN, COUNT occur in the query.
 - select (max(salary_amount) min(salary_amount)) as salary_range from salary_history
- Previously neither Min key lookup nor Max key lookup would have been used.
- We now eliminate much lookup and cpu usage



Truncate Table Enhancement

- Fast Logical Area Delete Algorithm
 - Applied with uniform storage areas (for mixed areas we have to walk the area and delete rows one by one)
 - Updates ABM (area bitmap) and SPAM (space management)
 - Leaves record (index or table) in place but marks pages are unused
 - For tables with LoBV columns must walk the table and collect pointers (dbkey) for list of segments
- Customer reported problem when trying to TRUNCATE a table with ½ millions rows and over 4 billion LoBV segments.
 - Performed excessive I/O to the table, RUJ and AIJ. It Never finished!
 - TRUNCATE TABLE must scan the table and erase the LIST column data. In V7.3.2 (or earlier) would exhaust VM (P0) space trying to cache dbkey table



Truncate Table Enhancement(cont.)

- Revised Algorithm for Tables with LIST OF BYTE VARYING Columns
 - Table, index and list columns mapped to uniform areas now perform minimal I/O
 - The LIST column data is erased without the base table being updated. Therefore, only the LIST column data is written to the recovery journal(.ruj) and after image journal (.aij) files.
- V7.3.2.1 operation is now measured in seconds. Very little VM used.
- Also applied to DROP TABLE and ALTER TABLE ... DROP COLUMN.
- Note: Important the individual columns be mapped to their own (not shared) logical areas



New Median Function

- This release of Oracle Rdb includes a new statistical function MEDIAN.
- MEDIAN returns the middle value of the set of ordered values for the group. If the number of values is an even number then the result is the linear interpolation between the two middle values. NULL values are excluded from the set of values used by MEDIAN and are not counted.

Example:

SQL> select employee_id, count (*), avg (salary_amount) as avg edit using '- (7)9.9(2)', median (salary_amount) as median from salary_history where employee_id in ('00165', '00188') group by employee_id;

| EMPLOYEE_ID | | AVG | MEDIAN |
|-------------|----|----------|----------|
| 00165 | 12 | 9313.17 | 9017.00 |
| 00188 | 2 | 21093.00 | 21093.00 |



Secondary Password Support

- Secondary password: A user password that may be required at login time immediately after the primary password has been submitted correctly.
- This release of Oracle Rdb supports connecting with two passwords so that application environments which wish to use OpenVMS secondary password support can now participate with Rdb.
- The USER/USING syntax allows the application to accept two passwords for.
 - SQL> connect to 'alias "ALIAS3" file date, file personnel' as 'connection_name_3' user 'prodsystem' using (:password1, :password2);
- This can also be used for remote access when the target system is also running Rdb V7.3.2 or later.



RMU /Reclaim

- Use to reclaim free space by trimming the LDX and TDX structures on the page that reserve dbkeys
 - NB: DBKEY SCOPE IS ATTACH
- An online command but may abort due to contention
- Can Now Skip to the Next Spam Interval and/or Storage Area to Avoid Lock Contention
- New qualifiers
 - –/PAGE_SKIP_LIMIT will abandon area if this % of pages skipped
 - –/SPAM_SKIP_LIMIT will abandon area if this % SPAM ranges skipped
 - -/RETRY_TIME will retry if we had to abandon a storage area
- Allows better usage online when run in the background



Engine Error Logging

- This feature allows error messages returned from a database engine on a remote server to be logged. Only non success messages are logged.
 - Several way to enable e.g. Define the logical RDB\$RDB\$HR_ENGINEERR_LOG "ON"
- Example of an error report:

```
*** 17-MAY-2016 01:37:24.73: %RDB-E-ENGINEERR, The database engine has returned an error for client 15a250 connection 21 %RDB-F-SYS_REQUEST, error from system services request %RDMS-F-FILACCERR, error opening storage area file DISK1:[DATABASE]JOBS.SNP;1
```

***** Error while processing RCI_CLASS_REQ



RMU/SHOW AFTER_JOURNAL [NO]CHECKPOINT Qualifier

- RMU/SHOW AFTER_JOURNAL [NO]CHECKPOINT qualifier can be used to request that all active database processes on all nodes perform a checkpoint
- Purpose is to ensure that all active AIJ operations use the current After Image Journal database symbols values defined in the database root.
 - The checkpoint will only be executed if the RMU/SHOW AFTER_JOURNAL command /BACKUP_CONTEXT qualifier is also specified and the database fast commit to journal feature is currently enabled
 - /Backup_Context qualifier specifies that the following symbols be initialized (RDM\$AIJ_BACKUP_SEQNO, RDM\$AIJ_COUNT,RDM\$AIJ_CURRENT_SEQNO, RDM\$AIJ_ENDOFFILE, RDM\$AIJ_FULLNESS, RDM\$AIJ_LAST_SEQNO, RDM\$AIJ_NEXT_SEQNO, RDM\$AIJ_SEQNO)
 - A global checkpoint will be executed before the global symbols that start with 'RDM\$AIJ_' are defined or modified.



RMU/BACKUP/AFTER_JOURNAL [NO]SPACE_CHECK

- Avoids aborting due lack of space at the backup file creation time or while the backup is in progress
 - A fatal %RMU-F-FILACCERR error is output followed by the RMS-F-FUL error returned by OpenVMS and the backup operation is terminated.
- Based on a snapshot of the current target disk free space
- Examples:

```
%RMU-F-FILACCERR, error creating AIJ backup file DEVICE:[DIRECTRY]BACKUP_AIJ.AIJBCK;1 -RMS-F-FUL, device full (insufficient space for allocation) %RMU-F-FILACCERR, error writing to backup file DEVICE:[DIRECTORY]BACKUP_AIJ.AIJBCK;1
```

-RMS-F-FUL, device full (insufficient space for allocation)



Oracle SQL/Services 7.3.2.3

Bugs Fixed:

- Rdb computed column headers did not match the headers generated by Oracle Database. Needed to execute set sqlda enable full query header to make computed column header names the same as in Oracle Database.
- Unpredictable Occurrences of 17-NOV-1858 in VMS Date Columns. There was a scaled integer problem with date data.
- Update across a DBlink got ORA-01861: Literal Does Not Match Format String. There was a problem with alter session set nls_date_format.
- Got ORA-03115 error on next statement after an update using insert returning. Flags had not been cleared, causing a subsequent statement to look for input parameters.
- ALTER SESSION SET NLS_TIMESTAMP_FORMAT was not working if called from SQL init file. NLS parameters set in the sql init file were being reset in ORA_LOGIN.

Oracle SQL/Services and OCI Services 7.3.3.0

- Support for Oracle 11g Libraries and Oracle 11g Oracle Net Protocol
- OCI Authentication Today
 - -Currently users are defined in the USER\$ table
 - We store an encoded password (different encoding to that used by OpenVMS and LDAP servers)
 - This password is used to authenticate with the Oracle server
 - -RDB\$NATCONN_CUPP Utility used to add, modify, remove, and show users enabled for OCI access and to sync with updated VMS passwords

Oracle SQL/Services and OCI Services 7.3.3.0 (cont.)

- OCI Authentication with LDAP
 - Specify the password "GLOBAL", indicates (as it does for Oracle users) that authentication will be done using LDAP
 - Users with the password "GLOBAL" in the USER\$ table will be authenticated using the LDAP directory defined in LDAPACME\$INIT, the same LDAP directory used by Rdb for external authentication
- Testing
 - Testing has been successfully completed with Microsoft Active Directory. Patch 1845555 is required to provide the encryption of the passwords.
 - Testing is ongoing with Oracle Internet Directory



ORCM 7.3.2 New Features

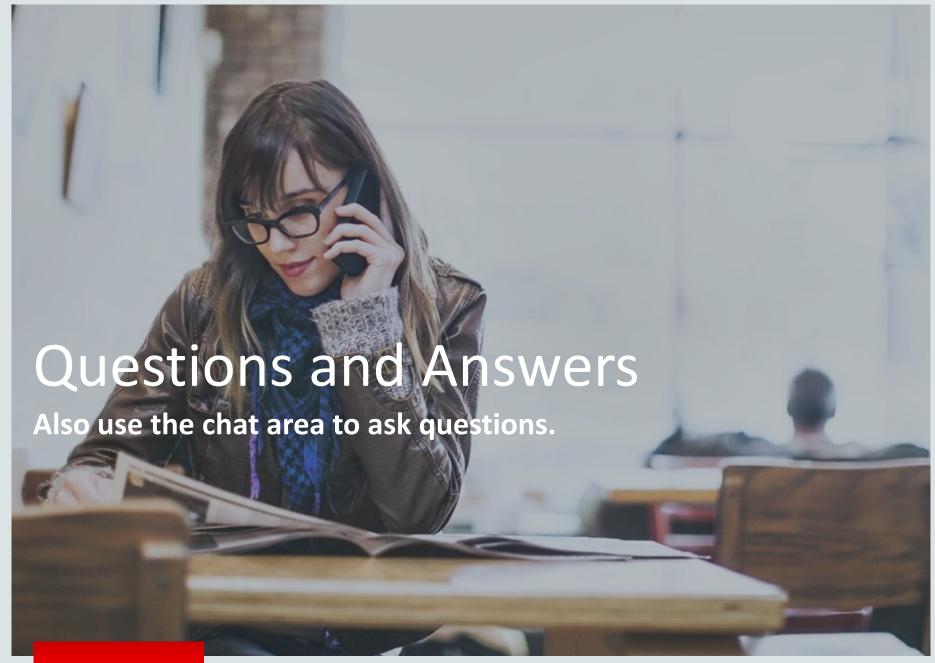
- New RMU Menu category
- RMU Statistics
- Find Schema
 Differences
- External Tool
 Enhancements



ORCM 7.3.2 Problems Fixed

- TCP/IP Timeout on SQS Control Connections
- Duplicate Connection entries in Connections table
- BADMESSAGE Exception when trying to Load Remote File





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