

Reality V15.1

Product Updates

To install these updates the following should serve as a guideline;

UNIX/LINUX platforms:

The file is delivered as a 'compressed' file to save download time. Once the compressed file is loaded onto the target machine it must be uncompressed. Use the UNIX 'uncompress' utility on Solaris and AIX, use gzip -d on Linux. The resulting file will be a UNIX 'tar' file. This 'tar' file needs to be extracted to a directory, change directory using 'cd' to a suitable place to hold the contents of the tar file and then use 'tar -xvf <path to filename>' to extract the contents of the tar file. Once the contents of the 'tar' file have been extracted you are then ready to proceed with the installation. To install all of the fixes, whilst logged in as the user 'realman', run 'install_fix -ay <absolute path to directory holding the fixes>'

Windows Platforms:

The file delivered is a self installing archive and can be run directly from Internet Explorer (or other web browser). Alternatively it can be downloaded and run as normal (double click it in explorer or type the name from command prompt).

The following fixes were released on 3rd August 2011.

Fix No	Bug No	Description
V15.1.0.0001	91077	Make SYS-UPDATE from V14.0 more resilient.

The following fixes were released on 17th February 2014.

V15.1.0.0002	91084 91094	Correct restore of non-Dptr items into SYSTEM.
V15.1.0.0003	91059	Prevents error messages being displayed during verbs such as FIND when querying SQL-VIEW files for item-ids that do not obey SQL rules.
V15.1.0.0004	85687	Solaris: Mount shadow fails fsck on zfs file system
V15.1.0.0005	91075	Resize existing AFS files during ACCOUNT-RESTORE
V15.1.0.0006	91087	Windows: Cannot create a database using realfstab
V15.1.0.0007	90994	Prevents RIF abort when SQL compiles "SELECT *". Now reports "Column '*' not found".
V15.1.0.0008	-----	Add ability to import .reg file
V15.1.0.0009	85684	Windows: realdump can hang trying to freeze the database
V15.1.0.0010	91090	Enable mini web server to support % escape in URL and pdf documents.
V15.1.0.0011	85695	Skip logoff messages when aborted by RDB
V15.1.0.0012	85697	Correct problems with updates of partial indexes.
V15.1.0.0013	85699	Fix sporadic issue where SP-JOBS fails to open jobs file
V15.1.0.0014	85698	GET-LIST could display incorrect list length.
V15.1.0.0016	85688	Allow PERFORM or EXECUTE to optionally input from dynamic array data.
V15.1.0.0017	85700	Fix verification of multi clog save to remote tape
V15.1.0.0018	91086 85665 91072	Enable HTTPS to access non validated server realprof fails to return any data realevent fails to send notification emails
V15.1.0.0019	91097	Correct OPTIMUM-FRAME-SIZE and OPTIMUM-MODULO TCL verbs.
V15.1.0.0021	91106	Fix netadmin list all hosts with large number of hosts.

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V15.1.0.0023	91088 91105	Enhance SYS-UPDATE error recovery.
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The following fixes were released on 29th May 2014

V15.1.0.0020	85698 91096	Correct 64bit optimisation of scan and move virtual instructions.
V15.1.0.0024	85713	Inhibit DataBasic history logging on a single level source file.
V15.1.0.0025	85711	Do not try to release any locks on a DataBasic Index or select variable.
V15.1.0.0026	-----	Improve info reported if parallel trestore fails.
V15.1.0.0027	91109	Allow DataBasic Object to operate with binary strings.
V15.1.0.0029	85724	Stop realcd core dump when using session licences
V15.1.0.0030	85718	Allow 8GB raw log to be used.
V15.1.0.0031	85718	Fix various problems when malloc arena exceeds 4GB
V15.1.0.0032	85299 91131	Enable ISTAT of large files
V15.1.0.0033	91135	The DataBasic debugger is unable to stop or see the statement following an ECATCH statement.
V15.1.0.0034	-----	NFM CDE full clean log access
V15.1.0.0035	85727	Allow DR to continue after failover of failsafe master
V15.1.0.0036	91138	Fix problem with DataBasic substring with -ve starts of binary strings.
V15.1.0.0037	90609	DELETE, EDELETE, PROC F-W and F-D now report if a file is update protected.
V15.1.0.0038	85731	Fix core dump when nesting index selects. Fix size of index key when reading index
V15.1.0.0039	91148	Enable fix 31 to be installed correctly
V15.1.0.0040	85732 85734	Fix indexes with a translate conversion and fix CREATE-INDEX (N of huge files.
V15.1.0.0041	85729 85730	Stop TL-REJECTs when deleting clean logs. Enable tlmenu to deconfigure Failsafe
V15.1.0.0043	-----	Completely remove Reality from Windows system
V15.1.0.0044	85727	Add database instance with -i or -a
V15.1.0.0046	85735	Reinstate CHARGE-TO display to WHO and U50BB.
V15.1.0.0047	91151	A DataBasic ACCESS abort could corrupt the DataBasic runtime stack.
V15.1.0.0048	91150	Fix creating multiple partition database in Windows
V15.1.0.0049	-----	PCL TO PDF CDE
V15.1.0.0050	-----	PF99.27 - Add initial support for despooler filters.

The following fixes were released on 20th June 2014

V15.1.0.0051	85736	Fix SQL view for 64 bit reality to SQLserver 2008
V15.1.0.0052	-----	Correct issues seen ODBC/SQL in VB prog on 64 bit
V15.1.0.0053	85714	Correct item body length of partial read of unchanged item.
V15.1.0.0054	85738	Diagnostic to help resolve SQL view problem
V15.1.0.0055	91158	SQL DROP INDEX causes core dump
V15.1.0.0056	85740	Add DataBasic session and object variables to VARVAL and VARVALTYPE functions.
V15.1.0.0057	85743	Enable new despooler filter feature.

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The following fixes were released on 12th November 2014

V15.1.0.0042	85733	Improve error messages if spinlock fails
V15.1.0.0058	85745 85736	Correct issues seen ODBC/SQL in VB prog on 64 bit
V15.1.0.0059	85714 85747	Correct item body length of partial read of unchanged item.
V15.1.0.0060	91169	DBO - Fix mishandling of numbers ending in D. Fix memory leak.
V15.1.0.0061	85471 85472 85780	Move DR delayed delete file to database and fix various hangups
V15.1.0.0062	85749	Ensure A*L*L FCB starts on a SR aligned boundary.
V15.1.0.0063	91172	Enable XML.GENERATE to handle mutivalue data including subvalues
V15.1.0.0064	85753	Correct restore of V14.0 DataBasic object items.
V15.1.0.0065	91175	Correct print-catalog with no file but 2 or more items.
V15.1.0.0066	85754	Fix bug where OG items in an AFS file can be corrupted after upgrading to 15.1
V15.1.0.0067	91178	Enable ISTAT ... (U to work on an active file
V15.1.0.0068	85755	Suppress benign daemon log errors for remote files
V15.1.0.0069	-----	PCL2PDF - Add font map, properties and back sheet configuration
V15.1.0.0070	85757	Fixes PERFORM TERM after PRINTER ON
V15.1.0.0071	85754	Preserve update time when AFS moves an item
V15.1.0.0073	85765	The realroot script now works ok in Bourne shell
V15.1.0.0074	85719	Enable RealEdit to select account/item name
V15.1.0.0075	85766	Correct DataBasic debugger Trace on 64 bit Solaris.
V15.1.0.0076	85771	Correct AND-LISTS and AND-ITEMS when used with a null list/item.
V15.1.0.0077	85772	Stop closing remote index from disconnection session.
V15.1.0.0078	85778	This fixes loss of keyboard data from Accuterm.
V15.1.0.0079	85779	Aborting window @ logon no longer causes 100% cpu
V15.1.0.0080	91031 91207	Enhance BVERIFY to fully compare objects while handling date and times separately.
V15.1.0.0081	85777	Provide support for NpuRetries & NpuDelay configs
V15.1.0.0083	91208	Stop LICENCE SFAM responding to junk item ID's
V15.1.0.0086	91217	Correct ALL SORT xmode problem.
V15.1.0.0087	85787	Fix SELECT/COUNT of DIR-VIEW on latest RedHat/Centos

The following fixes were released on 12th November 2014

V15.1.0.0085	85777	Diagnostic tracing for npu delays
V15.1.0.0089	91214	Unix: Allow debug build to include/exclude fixes
V15.1.0.0093	91219	Fix perl script warnings on Centos 7
V15.1.0.0094	85789	Ensure that the ALL window CB is on 8-byte boundary.
V15.1.0.0097	91222	Enable DIR-VIEW to list large items
V15.1.0.0098	91187	Enable build of reality on Centos 7
V15.1.0.0099	84797	Enable read of pre V14.0 compressed tape
V15.1.0.0100	85792	Correct BVERIFY of V14.0 or earlier object code.
V15.1.0.0101	-----	Fix corrupt dbfile on 32 bit Windows

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V15.1.0.0102	85702	Add SQLPRIV to SQL.DEMO
V15.1.0.0103	85756 85776 91197 91227 91226 91225	Various updates to tlmenu

The following fixes were released on 27th February 2015

V15.1.0.0072	91177	Allow database to be created with non AFS system files.
V15.1.0.0082	91200 91201 91205 91183 99.29	DataBasic Dump CDE and various DataBasic debugger fixes.
V15.1.0.0088	91215	Windows: Enable DBUPDATE to run correctly when telneted into database.
V15.1.0.0104	85795	Fix TL-STATUS (B corruption of secondary status
V15.1.0.0105	85792	Correct BVERIFY of V14.0 or earlier object code.
V15.1.0.0106	91232	Fix RealWeb insert item after DataBasic objects changes
V15.1.0.0107	85748	Fix issue of SERVICE-LOG items not wrapping at 999
V15.1.0.0108	91234	Stop binary DIR-VIEW on Unix clearing binary flag.
V15.1.0.0109	85804	Correct DataBasic CONVERT function if oldCharList is NULL.
V15.1.0.0111	85794	Allow DataBasic DUMP to work with external DataBasic.
V15.1.0.0112	91249	Enhance RESTORE to skip truncated DataBasic object items.
V15.1.0.0113	91242	Enhance DataBasic compiler to test string quotes in EQUATES at define time.
V15.1.0.0115	85808	Fix realdbck "ReloadPage Invalid argument" error
V15.1.0.0116	85809	Correct passing of a common array as a subroutine parameter.
V15.1.0.0117	91256	Maintain registers over an "Non-numeric" warning error message.
V15.1.0.0118	85698 91096 85798	Correct 64bit optimisation of scan and move virtual instructions.

The following fixes were released on 29th May 2015

V15.1.0.0114	91200 91210 91235 99.30	DataBasic Debugger CDE
V15.1.0.0119	91218	Correct ALL interface when reading an item that is not there.
V15.1.0.0120	91267 91236 91283	Various fixes and enhancement to install_fix
V15.1.0.0121	85810	Windows: tlmenu diagnostic for hang after redual
V15.1.0.0122	85812 85813	Windows: fix buffer overrun in smanager when logging server reject. Stop 'Lock 6' error message in Windows event log when starting realserv.
V15.1.0.0123	85814	Raw printing fixed on Windows 8 / 2012
V15.1.0.0124	85811	Correct return of file variable via a passed common variable assigned to a file variable.

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V15.1.0.0125	91280	Correct DataBasic IPM timeout of 255, and add timeout validation.
V15.1.0.0126	91282	Fix T-STATUS after T-DEVICE clears local definition
V15.1.0.0127	85788 91284	Ensure IPM sessions are correctly disconnected.
V15.1.0.0128	85825	Resolve problem where databases built on ZFS file system may be corrupt after system reboot.
V15.1.0.0129	91288	Windows: Fix DIR-VIEW problem where zero length files may not be visible.
V15.1.0.0130	91285	Enable millisecond time for DataBasic CONNECT/ACCEPT
V15.1.0.0131	85823	Enable tlrestore to move an open file.
V15.1.0.0132	85820	Ensure sort context workspaces are correctly cleaned up.
V15.1.0.0133	85826	Fix PCL2PDF graphic fills when watermark used
V15.1.0.0134	85828	Fix SIGSEGV when performing create of two indexes.
V15.1.0.0135	91297	Allow DataBasic Functions to use temp space.
V15.1.0.0136	91299	Fix bug in TCL stacker if max depth set to one.

The following fixes were released on 6th of November 2015

V15.1.0.0137	91272	Correct fault in an internal support option of the BASIC verb.
V15.1.0.0138	91134	Enhance NC.LIST to display number of named descriptors.
V15.1.0.0139	85832	Enable generation of more than 100 clean logs in a day
V15.1.0.0140	85831	Add Reality SYSTEM(117) and SYSTEM(118) and mvBase SYSTEM(35) to return program line number.
V15.1.0.0141	91304	Correct capture of a PERFORM SYS if result has no trailing LF.
V15.1.0.0142	91308	Remove name restriction on External User Functions when not saving result.
V15.1.0.0143	85835	Correct test for single or double quotes for PROCS & TCL2 verbs.
V15.1.0.0144	91309	Fix COPY-LIST with valid source account and invalid destination filename.
V15.1.0.0145	85836	Windows: Fix GPF when trying to read non-existent binary DIR-VIEW item.
V15.1.0.0146	85837	Stop 'Overwrite filesystem ...' prompt from mkdbase
V15.1.0.0147	85839 91314	RealEdit custom buttons
V15.1.0.0148	85838	DR: Recover form corrupt image response from master
V15.1.0.0149	91317	Fix hang of account restore when restoring DIR-VIEW
V15.1.0.0150	91324	Fix number of items displayed when using SELECT with View Compiled Programs option set.
V15.1.0.0151	91334	Fix database daemon abort on Linux when events enabled.
V15.1.0.0152	85845	Close vulnerability in mini web server where it could access any file on server.
V15.1.0.0153	91341	Correct DataBasic READPREV when used on a dynamic array.
V15.1.0.0154	91342	Clear confirm FD message in DESPOOLER.CONTROL file maintenance.

The following fixes were released on 25th of February 2016

V15.1.0.0155	91340	Improve BASIC compile error handling in LOOPS and CASE structures.
V15.1.0.0160	91336	Fix several SQL server issues including loss of rows.
V15.1.0.0161	91349	Install DataBasic V15.1 compiler fix for DataBasic objects
V15.1.0.0167	91321	Ensure CREATE-TRIGGER checks in correct account for trigger code.
V15.1.0.0168	85849 91353	Correct output of TL-AUTOSWITCH to report new clean log

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V15.1.0.0170	91354 91363	Windows: Enable shadow database to be configured
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Reality V15.2

Product Updates

Reality V15.2 service pack released 29th of February 2016

V15.1.0.0156	91339	Allow DB verb to accept lower case commands.
V15.1.0.0157	PF12.8	Resilience Monitoring
V15.1.0.0158	PF6.19	Release HyperFiles
V15.1.0.0159	91348 91362 91350	Enable multi clean log delete from tmenu
V15.1.0.0162	85710 90244 91328 91329	V15.2 DataBasic enhancement including FORMAT, MATCH{ES} and MATCHFIELD.
V15.1.0.0163	91335 90666 91364 91365	Supply the password definition feature
V15.1.0.0164	85549 85842 85840 91248 85717	Productise the DataBasic debugger module trap CDE.
V15.1.0.0165	85859	Productise the DataBasic dump enhancement.
V15.1.0.0166	3.17.1	Simple DataBasic Email API
V15.1.0.0169	----	Enable Internal DataBasic Objects with JSON interface. Trial Only
V15.1.0.0171	91000	Link default DataBasic compiler to user environment.
V15.1.0.0172	91277	SYS-UPDATE leaves T-DEVICE assigned.
V15.1.0.0200	V15.2	Reality 15.2 Release

V15.2 Product Updates

The following fixes were released on 4 May 2016

V15.1.0.0173	85863	Only display the extended VARVALTYPEs when configured to do so.
V15.1.0.0174	85867	Allow SEL-RESTORE of spooler items.
V15.1.0.0175	85862	Stop Reality crash when reading index after file save.
V15.1.0.0201	91371	Remove spurious "Password rejected" message from CREATE-ACCOUNT.
V15.1.0.0202	91368 91369 91370 91366 91378 91380	HyperFiles: Fix copy file handle in DataBasic. Fix for case insensitivity. Suppress RENAME-FILE and MOVE-FILE.
V15.1.0.0203	91373	Fix JSON parser when string starts with [. Fix missing "," after array definition. Allow creation of null fields. Fix bug in number detection in parameters. Fix GPF when returning long string.
V15.1.0.0204	85865	PCL2PDF fails to convert raster graphic when no start GL code present.
V15.1.0.0205	-----	Updates RealHttp API to include RESTful service functions and utility functions
V15.1.0.0206	-----	Add RESTful services to RealWeb
V15.1.0.0207	-----	Incorporate customer feedback to DEFINE-ENVIRONMENT & PASSWORD DEFINITIONS
V15.1.0.0208	91296 91086	RHTTP interface - fix secure sockets connections on all platforms
V15.1.0.0209	91377	Correct DataBasic debugger view of include source with alt file.
V15.1.0.0210	91381	Correct MATCHFIELD with out of range field.
V15.1.0.0211	85866	Correct COPY-LIST (D.
V15.1.0.0212	85873	Correct Unassigned Variable in OPTIMUM-MODULO (L.
V15.1.0.0213	91379	Add CAfile.pem to list of files updated by realclone -u

The following fixes were released on 23rd May 2016

V15.1.0.0214	91388	Allow initial null password in SSM USER field 17 Remote Systems.
V15.1.0.0215	91389	Fix index update for zero length key when numeric descending encoding used.
V15.1.0.0217	91391	LOAD-LANG now effective multiple times
V15.1.0.0218	85858	mksbase: Fix handling of -F to set frame size. Fix resizing database with alternate SYSTEM modulo. Lock database earlier to prevent access.
V15.1.0.0219	91395 91384	Fix handling of special methods in DataBasic Objects
V15.1.0.0221	91393	Unix: Fix install_fix handling of new Unix files
V15.1.0.0222	91296 91086	Windows: Supply correct .dlls for secure sockets operation.
V15.1.0.0223	91396	Fix various cosmetic issues with SSM Define Password Definitions & Logon msg.

V15.2 Product Updates

The following fixes were released on 31st August 2016

V15.1.0.0216	91386	Correct licence expiry + reporting
V15.1.0.0220	91392 91397 91426 85883	Enhance DataBasic Object usage syntax.
V15.1.0.0224	85857	Enable database creation on file systems greater than 1TB
V15.1.0.0225	91400	Improve error handling in SSM (6. Define Password Definitions
V15.1.0.0226	91401 91404 85863	Only display the extended VARVALTYPEs when configured to do so.
V15.1.0.0227	91403	Stop RHTTP_SOAP_REQUEST reporting unassigned variable error
V15.1.0.0228	85876 91405 91406	Enhance OPTIMUM-MODULO to cope with *s in account and file names.
V15.1.0.0229	91399	Correct the SLEEP until DataBasic code.
V15.1.0.0230	91398	De-reference Qptr into DataBasic catalog item for BVERIFY.
V15.1.0.0231	91407	Correct WRAPUP of BASIC of include item.
V15.1.0.0232	09137 2 09140 8 09140 9	Simple DataBasic Email API with Authentication
V15.1.0.0233	91422	Stop RHTTP functions reporting SESSION_COOKIES as unassigned
V15.1.0.0234	91413	Stop tmenu generating perl warnings when starting TL
V15.1.0.0235	91416	Return the correct resilience settings from listdb
V15.1.0.0236	91419	Extend initial source item verification of LOAD-BNF.
V15.1.0.0237	91423 91303	Stop install_fix generating error message when updating Unix file
V15.1.0.0238	85882	PCL2PDF fails to convert raster graphic with short lines.
V15.1.0.0239	85884	Speed up initial connect to raw partition database.
V15.1.0.0240	-----	Add new script show_fix
V15.1.0.0241	91383	Windows: Stop install_fix -a getting confused about service pack. Always update history record when updating fix.
V15.1.0.0242	91427	Enhance migration of POINTER-FILE to only timeout each remote account once!
V15.1.0.0243	85848	Enable sizemon to calculate new modulo for files larger than 2GB.
V15.1.0.0244	91402 91412	Enable mkdbase to change frame size when Vendor Emulation set
V15.1.0.0245	91394	Allow Hyper Files to open QPTRs and remote files

V15.2 Product Updates

The following fixes were released on 20th March 2017

V15.1.0.0095	85790	Enable error recovery after failure to generate ROS index key
V15.1.0.0247	91436	Enable DR restart after master TL-STOP START
V15.1.0.0248	91437 91420 91418	Speedup and add active list support for CSV-COPY.
V15.1.0.0250	85888	Handle error if password definition file missing from database or Denat.
V15.1.0.0251	91444	Add additional tests for an empty stack in English conversions.
V15.1.0.0252	85861 91414 91410	Isolate Basic Debugger from External and Embedded DataBasic contexts.
V15.1.0.0253	85891 85895	Add new priority 2 SYSMAN only LOGOFF-ALL TCL commands. Enable logoff of port waiting on item lock.
V15.1.0.0254	91447	Enable realdbck on windows to use cache size greater than 0.5GB
V15.1.0.0255	91450	Improve error handling around 2GB max workspace size.
V15.1.0.0256	85893	AIX Linux fix handling of ANALYZE after DataBasic PAUSE statement
V15.1.0.0257	85894	Add filter to stop multiple DataBasic error dumps
V15.1.0.0258	91448	Correct RND with requested numbers > 32k.
V15.1.0.0259	85896	Correct possible memory leak in index code.
V15.1.0.0260	85897	Opening files with indexes to named common can cause a core dump after a LOGTO.
V15.1.0.0261	91155	Fix killreal -l and netadmin permissions problems
V15.1.0.0262	91451 91452 91474	Fix problems with DataBasic string numbers in CAT, CRT, NUM, ABS, INT, NEG and FOR.
V15.1.0.0263	91453	Enable core dumps on Windows
V15.1.0.0264	85860	Stop minor state being cleared when process still waiting
V15.1.0.0265	91456	Serial number installation enhancements
V15.1.0.0266	91456	Serial number installation enhancements
V15.1.0.0267	91457	Correct MCBX conversion when string is (8x)+1 characters long.
V15.1.0.0269	85901	Use frame size in calculation of STAT-FILE data definition of new modulo.
V15.1.0.0270	91465	Fix realfuser core dump on AIX
V15.1.0.0271	91466	Allow empty object in JSON document
V15.1.0.0272	-----	Fix problems in RHTTP ENCODE DECODE PARSE URL
V15.1.0.0273	91466	Enable HTTP-SERVER to be shut down cleanly
V15.1.0.0274	91468	DataBasic READT, WRITET not taking ELSE clause if unassigned tape.
V15.1.0.0275	91471	Add error handling to MCNP output conversion.
V15.1.0.0276	91472	Correct display of SSM 2) Define User Profile 7) Default Account Name.
V15.1.0.0277	91469 91476	Speed up installing fixes on database
V15.1.0.0278	85898	Add PLID to SamPortNew max ports warning
V15.1.0.0279	85908 85910	Fix PCL2PDF GL x axis scaling. Fix slope calculation.

V15.2 Product Updates

The following fixes were released on 17th August 2017

V15.1.0.0280	85906	Add Verbose display option to BUILD.PRINTERS.
V15.1.0.0281	91480	Various paths through the DataBasic FOR code treat a zero step differently.
V15.1.0.0282	91481	Report session licence expiry on logon + fixes to expiry reports.
V15.1.0.0283	91482	Allow LICENCEGRACEPERIOD to be superseded
V15.1.0.0284	85905 85913	Windows: Fix malloc arena corruption causing core dump
V15.1.0.0285	85915	Updating very badly sized AFS file can lock up holding group lock
V15.1.0.0286	91485	Fix problem causing occasional duplicate items
V15.1.0.0287	85911	Allow the PASSWORD command to go interactive if run from a program.
V15.1.0.0288	85914	Cannot break multithreaded tstore using ^C
V15.1.0.0289	91486	Fix SIGSEGV for 'SYS xxx' by user level 0 1
V15.1.0.0290	91367	Provide server to port mapping feature PF11.6.1
V15.1.0.0291	85918	Enable TL-RESTORE to clear restoring status when it exits.
V15.1.0.0292	91360	Prevent database owner impersonation.
V15.1.0.0293	-----	Changes to allow onsite Reality build with UXC 2.2
V15.1.0.0294	85921	Reduce memory usage of fsr
V15.1.0.0295	85920	Suppress 'Post connection failure' messages in daemon.log when no verification required.
V15.1.0.0297	85919	Add option to CATALOG to suppress full path expansion of a Q-pointer source.
V15.1.0.0298	85922	Add item name to error 402 if called from DataBasic.
V15.1.0.0299	91490	Reject sentence macros with same format as data definition.
V15.1.0.0300	85923	Fix LOGON port after it has died
V15.1.0.0301	91456	Serial number installation enhancements
V15.1.0.0302	85926	Enable use of REALLOGLEVEL in realityrc file on Windows, with fix 303
V15.1.0.0303	85926	Reduce swamping of daemon log with TERMED errors, with 302
V15.1.0.0305	85881	Diagnostic to resolve multi-threaded restore issues
V15.1.0.0306	85924	Allow DBSTART proc to run when password on SYSMAN account
V15.1.0.0307	85928	Enable tstore on Windows to restore large images
V15.1.0.0308	85929	Stop http probe test causing realserv to fail.
V15.1.0.0310	85932	Prevent unnecessary DataBasic garbage collection.
V15.1.0.0311	85933	Correct T-DUMP T option.

The following fixes were released on 15th May 2018

V15.1.0.0296	49260	Trigger CDE.
V15.1.0.0312	85935	tlmenu: Enable copy restore of all logs in recovery mode
V15.1.0.0313	91493	Activate DataBasic split screen debugging.
V15.1.0.0314	91494	Correct minor SQLM bugs.
V15.1.0.0315	91501	Stop MOVE-FILE black holing file if destination is access protected.
V15.1.0.0316	85851	Correct ROSFS case insensitive llock handling.
V15.1.0.0317	85936	Fix issue logging on to specified port
V15.1.0.0318	85937	Allow REMOVE and REMOVE.POS to work with a numeric variable.
V15.1.0.0319	91507	Correct File despooler with multiple jobs.
V15.1.0.0320	91508 91511	Correct DataBasic debugger hex display of package and other variables.

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V15.1.0.0322	85940	Fix Err 14 abort during LOGOFF, due to ACCESS(16) on named common file var.
V15.1.0.0323	85941	Fix issue of Reality core dumping in log off
V15.1.0.0324	85939	Fix realdump not deleting shared memory on exit
V15.1.0.0325	85942	Resolve issue with time in milliseconds wrong around midnight.
V15.1.0.0327	85943	Remove diagnostic fix 0305
V15.1.0.0328	85944	Fix unassigned variable error in PCL2PDF
V15.1.0.0329	91513	Fix build menu when unpacking libraries
V15.1.0.0330	85946	Fix issue with SQLSRVR logging off when rowset exceeds 100 rows
V15.1.0.0331	85949	Prevent cloned instance connecting to database in base instance
V15.1.0.0333	91521	Correct date picture conversion code.
V15.1.0.0334	91519	Cannot bind database on Windows
V15.1.0.0336	85948 85945	Fix DR delay between clean logs. Fix saving of recovery file.
V15.1.0.0338	85951	Avoid deleting clogs if not successfully saved

The following fixes were released on 13th May 2019

V15.1.0.0304	90770 91191 91496 91498 91502 91510	Extend global md use to Qfiles and programs and restrict access.
V15.1.0.0321	91509	Ensure SYSTEM(15) always returns the correct information.
V15.1.0.0326	91042 90757 91516 85712 91514 91523 91524	Add application keys & fix remote instant Q pointers etc.
V15.1.0.0332	85950 91522	Fix dedicated port ranges for ports > 400 and use of reserved ports
V15.1.0.0335	90971	Ensure overlay items in ISIS{.TE} and REALLINK remain after a SYS-UPDATE.
V15.1.0.0337	91518	Fix internal objects problems with %ARRAY and %TYPE accessing arrays.
V15.1.0.0339	85176	Increase INPUT, inactivity and login timeouts to 45.5 hours
V15.1.0.0340	85952	Stop substring extract of zero length being marked as binary.
V15.1.0.0341	85954	Fix DR client hang after clean log switch
V15.1.0.0342	91530	Extend range of SYSTEM(9) CPU usage figure.
V15.1.0.0343	91531 91532	Ensure tidy up occurs when interrupting create index
V15.1.0.0344	85953	Stop old restore clog being protected in multi clog list
V15.1.0.0345	91536	Validate devices file against correct db config file
V15.1.0.0346	91538	Possible problem with sequential access when splitting group.
V15.1.0.0347	85956	Serial number check fails after reboot of RedHat running on SSD
V15.1.0.0348	91539	RealEdit Debugger enhancement
V15.1.0.0349	91541	Make the DSPMON.CONTROL data section DL instead of DY for FILE-SAVE.
V15.1.0.0350	91470	Improve display of remote hosts in SSM USER configuration

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V15.1.0.0351	91543 85958 85720	Fix SE format command, item locks on rename and item locked message SE ED ME
V15.1.0.0352	91544	Optimise File name string space.
V15.1.0.0353	91545 91547 91553 91555	Various DataBasic Debugger enhancements.
V15.1.0.0354	91546	Ensure WHERE options are always passed to verb.
V15.1.0.0355	85960	Item lock taken in transaction persists after TRANSEND
V15.1.0.0356	91547	Add VB style Interpolated Strings to DataBasic.
V15.1.0.0357	91548	Fix web server re-accept
V15.1.0.0358	91550 91504	Do not update despooler device name when interface script does not exist
V15.1.0.0359	91552 91555	Correct DataBasic debug LP and stop ? output going to printer!
V15.1.0.0360	85961	Enable hyper files to be created with a descending table. Allow Hyper Files to use compound correlatives
V15.1.0.0361	91549	Enable multiple database update using tmenu.
V15.1.0.0362	91551	Allow DataBasic PERFORM CAPTURING to capture results of child PERFORM's.
V15.1.0.0363	91554	Allow READBLK to correctly use specified or open block size.
V15.1.0.0364	91557	Ensure consistency with 5 and 10 character user and account passwords.
V15.1.0.0365	85962 91559	Fix core dump on severed connection. Add DDA 'write buffering' command.
V15.1.0.0366	91560	Fix NET-LOGON on Windows
V15.1.0.0367	85963	Ensure temporary file names are unique to process
V15.1.0.0368	91177	If no modulo in CREATE-FILE then always force AutoFile Size on.
V15.1.0.0369	91561	Allow logon if no available item-locks and TCL logging active.
V15.1.0.0370	91563	Refinements to REST-ENABLE

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The following fixes were released on 30th April 2020

V15.1.0.0371	91565	Enable use of session licences on ssh connections																										
V15.1.0.0372	91567	Enable tlmulti selection of primary secondary database. Prevents the deletion of Clean Logs (tlmulti) if the database is defined as a secondary																										
V15.1.0.0373	91569 91566	Correct DataBasic debugger L and V commands when listing more than one include line.																										
V15.1.0.0374	85965	Enable RealEdit V1 to connect to database after enabled debugger on RealEdit V2																										
V15.1.0.0375	91573	Add BITAND, BITOR, BITXOR, BITNAND, BITNOR, BITXNOR and BITNOT DataBasic functions . Documentation for these items is available on the Reality website on the usual documentation page																										
V15.1.0.0376	85966	Resolve memory allocation issues on Solaris 11.4																										
V15.1.0.0377	91574 90792 85550 90787 90786 91579	<p>Enhance English sentence to allow dynamic modification and compatibility with other flavours such as D3</p> <p>A) two DICT items to GLOBAL.MD NBR and ID</p> <p>B) new NI-SUPP and (J These remove the counter shown at end of report</p> <p>C) new TCL-SUPP</p> <p>D) English Enhancements to allow dynamic listings.</p> <table border="1"> <thead> <tr> <th>KEY</th> <th>Modifies attribute:</th> <th>Changes</th> </tr> </thead> <tbody> <tr> <td>COL-HDR</td> <td>3</td> <td>The column header</td> </tr> <tr> <td>OUT-CONV</td> <td>7</td> <td>The output conversion</td> </tr> <tr> <td>SEL-CONV</td> <td>8</td> <td>The pre-selection conversion</td> </tr> <tr> <td>COL-JUST</td> <td>9</td> <td>Column alignment type One of the following "LIRTU"</td> </tr> <tr> <td>COL-WIDTH</td> <td>10</td> <td>The column width.</td> </tr> </tbody> </table> <p>For compatibility with D3 & Unidata the following additional English modifiers will also be allowed:</p> <p>FMT - modifier allows any/all of the column header, justification & width to be altered.</p> <p>Format => FMT "[<i>header</i> <i>justification</i> <i>width</i>]"</p> <p>Where:</p> <table border="1"> <tr> <td><i>header</i></td> <td>' column header ' must be in single quotes.</td> </tr> <tr> <td><i>justification</i></td> <td>A single "R", "L", "T", "I" or "U" character.</td> </tr> <tr> <td><i>width</i></td> <td>A decimal number representing the column width.</td> </tr> <tr> <td>Notes</td> <td>The order of the fields is optional. Unquoted spaces, "%", "*" and "#" are ignored. This allows the Unidata FMT "R%10" to work!</td> </tr> </table> <p>CONV - this is the same as the SEL-CONV modifier.</p>	KEY	Modifies attribute:	Changes	COL-HDR	3	The column header	OUT-CONV	7	The output conversion	SEL-CONV	8	The pre-selection conversion	COL-JUST	9	Column alignment type One of the following "LIRTU"	COL-WIDTH	10	The column width.	<i>header</i>	' column header ' must be in single quotes.	<i>justification</i>	A single "R", "L", "T", "I" or "U" character.	<i>width</i>	A decimal number representing the column width.	Notes	The order of the fields is optional. Unquoted spaces, "%", "*" and "#" are ignored. This allows the Unidata FMT "R%10" to work!
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Notes	The order of the fields is optional. Unquoted spaces, "%", "*" and "#" are ignored. This allows the Unidata FMT "R%10" to work!																											

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Examples:

```
LIST MD A16 COL-HDR "Wages" COL-JUST R COL-WIDTH '11
LIST MD A16 COL-HDR 'Wages' COL-JUST "R" COL-WIDTH 11
LIST MD A16 COL-HDR Wages COL-JUST 'R' COL-WIDTH '11'
```

All the above are the same showing various uses of the allowed delimiters, the only time single or double quotes MUST be used is within a column header if it contains a space character.

The following are also examples of the above written with the FMT modifier.

```
LIST MD A16 FMT 'Wages'R11"
LIST MD A16 FMT " R #11'Wages' "
LIST MD A16 FMT " %11 R 'Wages' "
LIST MD A16 FMT " *11 'Wages' R "
```

These would ALL list the MD using the following dynamic data definition item:

001	A
002	16
003	Wages
004	
005	
006	
007	
008	
009	R
010	11

V15.1.0.0378	91575	Allow SAVE options X or Y to be used without options Z or S.
V15.1.0.0379	91576	Fix restore of data section create image
V15.1.0.0380	85968	Stop SIGHUP in early stages of login cause reality to exit
V15.1.0.0381	85967	Fix tlmenu syntax error on line 180
V15.1.0.0382	91558	Fix listing LFB special file
V15.1.0.0383	85969	Reduce eliminate hit processes on abortive terminal closure
V15.1.0.0384	85970	Fix getcwd following symbolic links.
V15.1.0.0385	91580	Correct REST-ENABLE handling of @PARAM and provide updated RW_RESTFUL
V15.1.0.0386	91582	Correct the index handling of null nodes and end of list event
V15.1.0.0387	----	Add clean log export feature. This is a licenced enhancement to extract data from a Clean log into JSON format. This patch also corrects some syntax errors within tlmenu
V15.1.0.0388	85971 91583	READNEXT of the output of an ISELECT with KEYS-ONLY truncates the item count.
V15.1.0.0389	91585	Correct release of item locks for VERIFY-INDEX (T with MvStyleItemLocks set
V15.1.0.0390	91586	Correct Variable Unassigned error in Network File Maintenance
V15.1.0.0391	91587	Correct DBO %Admin handling of both formats of the function
V15.1.0.0392	91562	Add a number of monitoring utilities to listdb

		<p>Usage</p> <pre>:listdb -h -h displays this help -d dbname only for this database -s delimiter change default delimiter () -r gives resilience type -t gives type of database -o return database owner -l return database locked state -i return database instance path -a gives all information (-r,-t,-o,-l,-i) Extended options: -I return database instance number -S return database size type -m return database emulation code -u/-w return user licence usage or full details -c return the status of the instance -e return resilience configuration -f return resilience status -p return database space usage -V display all extended information -H display in Human readable format</pre>
V15.1.0.0393	91588	<p>New SP-SUMMARY verb to summarise form queue contents</p> <p>SP-SUMMARY</p> <p>Summarises the Spooler's formqueues contents and statuses.</p> <p>Syntax</p> <p>SP-SUMMARY</p> <p>Form Queue Summary Screen</p> <p>Entering SP-SUMMARY at TCL initially displays a list of formqueues similar to the following:</p> <div data-bbox="464 1392 1560 1843" style="border: 1px solid black; padding: 5px;"> <pre>15:12:30 26 Mar 2020 64 Print Jobs Page 1/ 1 Form queue Jobs Oldest Form queue Jobs Oldest DAVES1 1 26 Mar 20 10:54 STANDARD 63 08 Nov 19 11:43 1. Switch view 2. SP-STATUS 3. SP-JOBS 99. Exit</pre> </div>

Enter action code / Option (P#)

This initial screen displays a list of current formqueue names together with their total number of print jobs and the time and date of the oldest job. At the bottom of the screen, four action codes are displayed. Action codes 2 and 3 correspond to their equivalent TCL command that performs the same function.

Note: This screen only shows the status of queues in the Reality environment.

Form Queue Status Fields

Form Queue Name The name of the formqueue. This field is 17 characters wide. Names over 17 characters long are truncated.

Jobs The total number of jobs currently in the formqueue.

Oldest The date and time of the oldest job in the formqueue.

Selecting an Action Code

To select a particular action code you enter the appropriate number at the screen prompt.

Selecting a Screen Page

The Form Queue Summary display may contain more than one screen of Spooler status information. The number of pages available and the current page number are displayed at the top right corner of the screen. To page through the screens, press RETURN. To skip to a particular page, enter `p`, followed by the page number (`#`).

Use of the Equivalent TCL Command

Instead of selecting an action code from the Form Queue Status screen, you can enter the equivalent TCL command. For example, instead of using Action Code 2, you can enter the SP-STATUS command at TCL.

Action codes with equivalent TCL commands are listed at the beginning of this topic. The syntax for each TCL command is also described in this section.

Action Code 1 Switch View

Switches the display to the alternative view showing a summary of the statuses for each formqueue similar to the following:

Form Queue Status Summary Screen

13:52:42 30 Apr 2020

2 Print Jobs

Page 1/ 1

```
Queue Name      Status          Number  .... Size  ....  .... Copies ....
                Jobs      Total Printed  Total Printed
STANDARD        Hold           2       3       0       2       0

1. Switch view  2. SP-STATUS   3. SP-JOBS   4. Reset     99. Exit

Enter action code / Option (P# / Q quename)
```

This alternate screen displays a list of current formqueue names with a breakdown of their jobs summarised by status, together with their total number of print jobs and totals for their sizes and copies. At the bottom of the screen, five action codes are displayed. Action codes 2 and 3 correspond to their equivalent TCL command that performs the same function.

Note: This screen only shows the status of queues in the Reality environment.

Form Queue Status Fields

Form Queue Name	The name of the formqueue. This field is 17 characters wide. Names over 17 characters long are truncated.
Status	The status of jobs currently in the formqueue.
Number Jobs	The total number of jobs of that status in the formqueue.
Size Total	The total size of the jobs of that status in the formqueue.
Size Printed	The total printed size of the jobs of that status in the formqueue.
Copies Total	The total number of copies of the jobs of that status in the formqueue.
Copies Printed	The total number of copies printed of the jobs of that status in the formqueue.

Action Code 1 Switch View

Switches the display back to the initial view showing a summary of jobs for each formqueue.

		<h2>Action Code 4 Reset Selection</h2> <p>Resets the screen so that it displays summarised details for all formqueues. This may be used after a Q option has been entered at the prompt:</p> <p>Enter action code / Option (P# / Q quename)</p> <p>that restricts the display to a single formqueue.</p> <h2>Exiting to TCL</h2> <p>To exit to the TCL prompt, select Action Code 99.</p>
V15.1.0.0394	91589	<p>realevent enhancements for items and extended html templates</p> <p>This adds new options to the existing realevent command</p> <h3>Parameters</h3> <p>htmltemplate Path to html message template.</p> <h3>Notifiers</h3> <p>item Create a file for each notification in the directory with a prefix specified by the recipient, or if blank, defaults to 'files/event'. The file name is suffixed with a unique ascending identifier based on the date/time. This same identifier is included in the item as an additional field 'Number: '.</p> <p>html As 'html' but adds the new field 'Number: ' containing a unique ascending identifier based on the date/time.</p>
V15.1.0.0395	91434	<p>New NEW.LISTVERBS verb to provide improved layout of details over original LISTVERBS verb</p> <h3>Syntax</h3> <p>NEW.LISTVERBS {(options)}</p> <h3>Options</h3> <p>Default is to show all verb definitions from the GLOBAL.MD, any alternative MD and the local MD.</p> <p>N No page. Suppresses automatic paging.</p> <p>P Printer. Sends output to printer assigned to your port.</p> <p>G Global MD. Only show entries in the GLOBAL MD.</p> <p>A Alternative MD. Only show entries in the users alternative MD.</p> <p>M Local MD. Only show entries in the users MD.</p>

		<p>X Extended. Show all items in the MD rather than just verbs. This a debugging option</p> <p>Example</p> <pre>:NEW.LISTVERBS</pre> <p>The command clears the screen and displays a listing similar to the following:</p> <pre> Page 1 10:42:53 24 Oct 2019 Name and location .. Code ... Type Details ADD PA TCL-I End points 40A0 /DAVES/ ADD V Synonym for ADDX /DAVES/ALT.MD,ALT.MD ADDX PA TCL-I End points A0 /GLOBAL.MD/ AFS-CLEAR P DataBasic catalogued in POINTER-FILE /DAVES/ on SYSFILES as AFS-CLEAR AND-ITEMS PL TCL-II End points 2,A471 /DAVES/ parameters Z BSELECT PA TCL def End points 35,4D,352B /DAVES/ </pre>
<p>V15.1.0.0396</p>	<p>85972</p>	<p>New PH-MONITOR verb to monitor output of TIPH process, enhancement to PH-START</p> <p>Displays the latest output lines of a specified TIPH port. Note: The M option of PH-START must be used for this verb to work on Windows systems.</p> <p>Syntax</p> <pre>PH-MONITOR portno {lines}</pre> <p>Syntax Elements</p> <p>Default is to show all verb definitions from the GLOBAL.MD, any alternative MD and the local MD</p> <p>portno The port number of the TIPH to display the output from.</p> <p>lines The number of lines to display from the end of the TIPH output. If not specified then the default is the last 10 lines.</p> <p>Example</p> <pre>:PH-MONITOR 402</pre> <p>The command displays last 10 lines (the default) of the output from the TIPH running on port 402</p>

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		<pre>:PH-START Enter task id for TIPH task?TEST Enter port number for TIPH task? Enter options?M Enter account for TIPH job?SYSMAN Enter account password? Enter command stream <CR to end> Use '<' for a null line >WHERE >POVF >TIME >SLEEP 120 >OFF > [1000] Tiph job started on account 'SYSMAN' using port 402 :PH-MONITOR 402 Last 10 lines of TIPH output for port 402 :POVF Total size 1.8 GB Total free 125.1 MB Percent free 6.95 :TIME 17:01:18 22 Apr 2020 :SLEEP 120</pre>
		<h2>PH-START</h2> <h3>Options</h3> <p>M Enables monitoring tag in TIPH output (required to work on Windows)</p>
V15.1.0.0397	91591	<p>Enhance LISTFILES to allow sorting of files by descending total file size</p> <h2>LISTFILES</h2> <h3>Options</h3> <p>V {limit} Sort the output by the descending total size of each file. An optional limit may be specified to restrict the output to files with a total size of over that value.</p>

V15.1.0.0398	91593	<p>New GSSM verb to allow a global update of items in the files NETWORK, USERS and SECURITY (as controlled with menu within SSM)</p> <h2>GSSM</h2> <p>Allow the bulk updating/creating of user, network or security items from a SELECT list that are based on an existing or new item. This uses the existing SSM screens for USERS, SECURITY and NETWORK to allow modifying an existing item or creating a new one.</p> <h3>Syntax</h3> <p>GSSM {?} item ({U}{N}{S}{A}{C}{M}</p> <p>Default is to show the usage details</p> <p>? Show the usage details</p> <p>item The item id of the USERS, SECURITY or NETWORK source item to be used as the basis for the updating/creating. This can be an existing item or can be created (See C option). There are restrictions to the items than can be used</p> <p>U This is to affect the USERS file items. When using an existing item, the description and password fields cannot be modified. The following USER items are reserved cannot be used as a source item: DEFAULT, DSPMON, FILEDSP, NETDSP, REMFS, RLTYXDSP, SQLDEMO, SYSMAN and TAPEDSP</p> <p>N This is to affect the NETWORK file items. When using an existing item, the description and CCI fields cannot be modified. The following NETWORK items are reserved cannot be used as a source item: DEFAULT</p> <p>S This is to affect the SECURITY file items. The following SECURITY items are reserved cannot be used as a source item: DEFAULT, DEFAULT.EXPLORER, DEFAULT.HARNESS, DEFAULT.REALWEB, DEFAULT.WEBSERVICE, REMFS, SYSMAN, SYSMAN.EXPLORER and TL.SECURITY</p> <p>A Add any items from the select list that do not already exist.</p> <p>C Allow the creation of the source item if it does not already exist.</p> <p>M Allow modification of the active select list of items or creation of a new select list if one is not active (See list maintenance details below). The list maintenance will validate that each entry exists in the file before adding to the list unless combined with the A option.</p> <h3>Restrictions</h3> <p>Can only be run from the SYSMAN account.</p> <h3>Comments</h3> <p>One of options U, N or S must be specified. Newly created items based on the source item will use their id as the description rather than the source items description.</p>
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If no changes are made to an existing source item using either EX or FI, the items in the active select list will not be changed and will report "No changes made."
If the existing source item is deleted using FD or a new item is abandoned using EX, the items in the active select list will not be changed and will report "'<itemid>' has been deleted."

Examples

- To modify/create users based on a new user USER0, with an active select list containing the items USER1, USER2 and USER3 where only USER1 exists in USERS

```
3 Items selected.
```

```
>GSSM USER0 (UCA
```

```
<set up USER0 as required and then FI>
```

```
Apply changes to supplied list of items (Y/N) Y
```

```
'USER1' has been updated.
```

```
'USER2' has been added.
```

```
'USER3' has been added.
```

The options used are U for USER items, C for creating the source item if necessary and A to add any items that do not exist.

- To modify existing entries based on an existing entry NETWORK0, where the list of entries to maintain will be entered manually. This is useful to create a list where it is difficult to generate an active select list

```
:GSSM NETWORK0 (NM
```

```
<enter the list of entries and confirm>
```

```
<modify NETWORK0 as required and then FI>
```

```
Apply changes to supplied list of items (Y/N) Y
```

```
'NETWORK1' has been updated.
```

```
'NETWORK2' has been updated.
```

```
'NETWORK3' has been updated.
```

The options used are N for NETWORK items and M to maintain a list of entries

List Maintenance

This will allow the entries in an active selection list to be modified or if no list is active, create a list of entries.

The initial display (for example with items from an active selection list) may appear as

V15.2 Product Updates

		<p style="text-align: center;">GSSM Maintain list of USERS item ids</p> <hr/> <p style="text-align: right;">Page 1 of 1</p> <ol style="list-style-type: none">1. USER12. USER23. USER3 <p>Option:</p> <p>'P'rev Page, 'N'ext Page, 'F'irst Page, 'L'ast Page, 'S'ort Items, 'H'elp '*' add all items in file, 'A'dd items, 'D'elete items, 'C'ompleted, 'Q'uit</p> <p>Each command is accessed as a single keystroke with the available commands being described when the H key is pressed.</p>																										
		<p style="text-align: center;">GSSM Maintain list of USERS item ids</p> <hr/> <table><tr><td>'S'ort items</td><td>Sort the list into alphabetical order (after confirmation) and redisplay the list starting at the first page</td></tr><tr><td>'F'irst page</td><td>Display the first page of the list if not already displayed</td></tr><tr><td>'N'ext page</td><td>Display the next page of the list if not at the last page</td></tr><tr><td>'P'revious page</td><td>Display the previous page if not at the first page</td></tr><tr><td>'L'ast page</td><td>Display the last page if not already at the last page</td></tr><tr><td>'*'</td><td>Add items from the file that are not already in the list</td></tr><tr><td>'Q'uit</td><td>Abandon this list (after confirmation)</td></tr><tr><td>'C'omplete</td><td>The maintenance of this list is complete (after confirmation)</td></tr><tr><td>When</td><td></td></tr><tr><td>'A'dd items</td><td>Add items to the end of list until a null item is entered</td></tr><tr><td>'D'elete items</td><td>Delete items from the list until a null item is entered</td></tr><tr><td>'V'alidation</td><td>Toggle checking that the entries exist in the file before adding to the list.</td></tr><tr><td>'CR'</td><td>to return</td></tr></table>	'S'ort items	Sort the list into alphabetical order (after confirmation) and redisplay the list starting at the first page	'F'irst page	Display the first page of the list if not already displayed	'N'ext page	Display the next page of the list if not at the last page	'P'revious page	Display the previous page if not at the first page	'L'ast page	Display the last page if not already at the last page	'*'	Add items from the file that are not already in the list	'Q'uit	Abandon this list (after confirmation)	'C'omplete	The maintenance of this list is complete (after confirmation)	When		'A'dd items	Add items to the end of list until a null item is entered	'D'elete items	Delete items from the list until a null item is entered	'V'alidation	Toggle checking that the entries exist in the file before adding to the list.	'CR'	to return
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V15.1.0.0399	91598	<p>Additional Trigger types now available</p> <h2>Trigger-type</h2> <p>The type of trigger - the following are now available:</p> <p>READ or PRE-READ</p> <p>Runs the trigger routine before reading an item from the file.</p> <p>POST-READ</p>																										

	<p>Runs the trigger routine after reading an item from the file.</p> <p>CLEAR-FILE or PRE-CLEAR-FILE</p> <p>Runs the trigger routine before a CLEAR-FILE operation on a file data section.</p> <p>POST-CLEAR-FILE</p> <p>Runs the trigger routine after a CLEAR-FILE operation on a file data section.</p> <p>DELETE-FILE or PRE-DELETE-FILE</p> <p>Runs the trigger routine before a DELETE-FILE operation on a file dictionary or data section.</p> <p>POST-DELETE-FILE</p> <p>Runs the trigger routine after a DELETE-FILE operation on a file dictionary or data section.</p> <p>Syntax</p> <pre>DELETE-TRIGGER <i>file-specifier</i> [<i>trigger-type</i> *]</pre> <p>The type of trigger may be:</p> <p>WRITE, PRE-WRITE, POST-WRITE, DELETE, PRE-DELETE, POST-DELETE, READ, PRE-READ, POST-READ, CLEAR-FILE, PRE-CLEAR-FILE, POST-CLEAR-FILE, DELETE-FILE, PRE-DELETE-FILE or POST-DELETE-FILE (see CREATE-TRIGGER)</p> <p>DELETE-TRIGGER <i>file-specifier</i> * will remove all triggers from a file</p>
	<p>New Verb LIST-ALL-TRIGGERS</p> <p>LIST-ALL-TRIGGERS</p> <p>Lists all the triggers associated with a Reality account.</p> <p>Syntax</p> <pre>LIST-ALL-TRIGGERS {<i>file-specifier</i>}</pre> <p>Comments</p> <p>The file specifier may be a local file (dictionary or data section), the master dictionary of an account or a combination of both. Triggers cannot be associated with Q-pointers. If no file specifier is provided, the current account is assumed.</p> <p>Example</p> <pre>:LIST-ALL-TRIGGERS /LIVE-ACCOUNT</pre> <p>Listing all triggers in Account 'LIVE-ACCOUNT'</p> <pre>LIVE-ACCOUNT STOCK WAREHOUSE</pre>

		<p>PRE-READ: WHSE.TRIG</p> <p>HISTORY</p> <p>PRE-READ: HIST.TRIG</p> <p>POST-WRITE: HIST.TRIG</p> <p>ORDERS</p> <p>ORDERS</p> <p>POST-WRITE: ORDER.TRIG</p>																																																								
		<p>Enhancement to ACCESS Function</p> <p>ACCESS(30)</p> <p>For each of the different calling environments, ACCESS(30) returns a number associated with the command or reason for entry.</p> <table border="1"> <thead> <tr> <th>Environment</th> <th>ACCESS(23)</th> <th>ACCESS(30)</th> <th>Calling Sub-environment</th> </tr> </thead> <tbody> <tr> <td>Trigger</td> <td>1</td> <td>0</td> <td>PRE WRITE trigger.</td> </tr> <tr> <td></td> <td></td> <td>1</td> <td>POST WRITE trigger.</td> </tr> <tr> <td></td> <td></td> <td>2</td> <td>PRE DELETE trigger.</td> </tr> <tr> <td></td> <td></td> <td>3</td> <td>POST DELETE trigger.</td> </tr> <tr> <td></td> <td></td> <td>4</td> <td>PRE READ trigger.</td> </tr> <tr> <td></td> <td></td> <td>5</td> <td>POST READ trigger.</td> </tr> <tr> <td></td> <td></td> <td>6</td> <td>PRE CLEAR FILE trigger.</td> </tr> <tr> <td></td> <td></td> <td>7</td> <td>POST CLEAR FILE trigger.</td> </tr> <tr> <td></td> <td></td> <td>8</td> <td>PRE DELETE FILE trigger.</td> </tr> <tr> <td></td> <td></td> <td>9</td> <td>POST DELETE FILE trigger.</td> </tr> <tr> <td>Conversion</td> <td>3</td> <td>0</td> <td>CALL conversion code.</td> </tr> <tr> <td></td> <td></td> <td>1</td> <td>B conversion code.</td> </tr> <tr> <td></td> <td></td> <td>2</td> <td>User-defined User Exit.</td> </tr> </tbody> </table>	Environment	ACCESS(23)	ACCESS(30)	Calling Sub-environment	Trigger	1	0	PRE WRITE trigger.			1	POST WRITE trigger.			2	PRE DELETE trigger.			3	POST DELETE trigger.			4	PRE READ trigger.			5	POST READ trigger.			6	PRE CLEAR FILE trigger.			7	POST CLEAR FILE trigger.			8	PRE DELETE FILE trigger.			9	POST DELETE FILE trigger.	Conversion	3	0	CALL conversion code.			1	B conversion code.			2	User-defined User Exit.
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V15.1.0.0400	91590	<p>Add new TIDYPF verb</p> <p>TIDYPF</p> <p>Display saved lists and cataloged items associated with accounts that no longer exist and optionally remove them.</p> <p>Syntax</p> <p>TIDYPF {account} {(options)}</p> <p>Syntax Examples</p> <p>The default is to show all lists and catalogued items for accounts that do not exist</p>																																																								

{account} The name of an account (either existing or no longer existing - see below). A list of accounts can be supplied from an active select list. If no account name is supplied, the default is to locate items for non-existent accounts.

Options

- N** No page. Suppresses automatic paging (No Page).
- R** Remove items when prompted to confirm. This only works for a single account that must not exist else this option is ignored.
- D** Does not show any details and does not show any prompt for confirmation. Each item that is deleted is represented by a dot character. This must be used in conjunction with the R option.
- L** Only consider saved lists.
- C** Only consider catalogued items.
- E** Include existing accounts to produce an output similar to LISTPF. This will ignore the R option
- A** Produce an alternative view of the items

Example

:TIDYPF

The default command displays all saved lists and catalogued items for accounts that do not exist

```
:TIDYPF
Listing possibly abandoned catalogued programs and lists           Page    1

Account ..... Type  Item..... Last Modification .....
DATA-BACKUP          L      LIST-FEB19      05 Mar 2019  04:11:59PM
DATA-BACKUP          L      SAVED-LIST      23 Apr 2018  08:44:12AM
***
TESTACC2018          C      TEST_PROG      25 Feb 2019  02:37:09PM
```

:TIDYPF (A)

The default command displays an alternate view

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		<pre> :TIDYPF (A Listing possibly abandoned catalogued programs and lists Page 1 Account/Item Last Modification DATA-BACKUP Saved Lists LIST-FEB19 05 Mar 2019 04:11:59PM SAVED-LIST 23 Apr 2018 08:44:12AM TESTACC2018 Cataloged Programs TEST_PROG 25 Feb 2019 02:37:09PM </pre>
		<pre> :TIDYPF TESTACC2018 (R Displays the saved lists and catalogued items for the TESTACC2018 that no longer exists and allow the items to be removed. :TIDYPF TESTACC2018 (RA Listing possibly abandoned catalogued programs and lists Page 1 Account/Item Last Modification TESTACC2018 Cataloged Programs TEST_PROG 25 Feb 2019 02:37:09PM Do you still want to delete these items (Y/N) ? Y Deleted TESTPACC2019_O*C*TEST_PROG from POINTER-FILE : </pre>
		<p>Listing SAVED-LISTS in existing accounts</p> <p>On the majority of systems, multiple users construct LISTS with the use of SAVE-LIST, COPY-LIST etc. These can adversely affect the behaviour of the system by 'filling' POINTER-FILE.</p> <p>TIDYPF accountname (EL</p> <p>This command will display all SAVED LISTS within the named account, any unwanted items may then be removed with DELETE-LIST</p>
		<p>Enhance DELETE-ACCOUNT</p> <p>DELETE_ACCOUNT</p>

		<p>Syntax</p> <pre>DELETE-ACCOUNT {account-name} {(options)}</pre> <p>Options</p> <p>D Suppress detailed listing.</p> <p>N Suppress paging of output.</p> <p>C Clean up possibly abandoned lists and catalogued items</p>
V15.1.0.0401	91595	<p>New Verb XDT</p> <p>XDT</p> <p>Displays dates and times converted between internal and external formats.</p> <p>Syntax</p> <pre>XDT [value] {(options)}</pre> <p>Options</p> <p>A Use alternative display format. Times will be displayed in 12-hour format and dates with 2-digit years. The defaults are 24-hour and 4-digit years</p> <p>I Inhibit prompt for value if no date/time value has been specified as part of the command.</p> <p>Operation</p> <p>The command will attempt to determine the type of value supplied from its format. If no value is supplied, the default is to use the current date and time and prompt for a value. If the value supplied is ambiguous then both time and date results are displayed.</p> <p>Comments</p> <p>The date format is recognised and displayed using the current DATE-FORMAT setting. The use of full stops in times is determined by the current setting of the ALT.MT environment option.</p> <p>Examples</p> <p>The following command displays the current date and time in both internal and external formats and prompts for a value to be converted.</p> <pre>:XDT</pre> <pre>Externally 15/06/2020 11:11:26 Internally 19160 40286</pre>

		<p>Enter date or time value:</p> <p>Show the possible date and time for a numeric value</p> <p>:XDT 12345</p> <p>Externally 18/10/2001 03:25:45 Internally 12345 12345</p> <p>Show the time and value for 10 minutes before midnight</p> <p>:XDT -00:10:00</p> <p>Externally 23:50:00 Internally 85800</p> <p>Accept a full date and display its value using a 2-digit year</p> <p>:XDT 23 March 1964 (A)</p> <p>Externally 23/03/64 Internally -1378</p> <p>Interpret the value with dots as a time rather than a date when the environment option ALT.MT has been set and display the results using 12-hour format</p> <p>:XDT 13.23.45 (A)</p> <p>Externally 01:23:45PM Internally 48225</p>
V15.1.0.0402	91596	<p>New Verbs – LIST-TABLE and SORT-TABLE</p> <h2>LIST-TABLE and SORT-TABLE</h2> <p>Generates an English listing in the same way as LIST or SORT but formatted similar to an SQL SELECT statement and is not paged.</p> <h3>Syntax</h3> <p>As for LIST/SORT.</p> <pre>LIST-TABLE filename BY dictitem list.of dict items (S</pre> <h3>Additional option (optional)</h3> <p>S Display the summary at the end of the listing</p> <h3>Comment</h3> <p>As the width of the columns cannot be determined until all the data has been processed, large data sets will take longer to display.</p> <h3>Example</h3>

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		<p>LIST-TABLE ROOMS WITH ROOM-CODE "ST" BED-TYPE RATE GUEST-NAME LEAVE-DATE (S</p> <table border="1"><thead><tr><th>ROOMS</th><th>Bed Type</th><th>Rate</th><th>Current Guest</th><th>Leave Date</th></tr></thead><tbody><tr><td>365</td><td>WaterBed</td><td>104.00</td><td>Ferguson</td><td>29/07/91</td></tr><tr><td>444</td><td>King</td><td>82.00</td><td>Curtis</td><td>26/07/91</td></tr><tr><td>222</td><td>WaterBed</td><td>104.00</td><td>O'Brien</td><td>23/07/91</td></tr><tr><td>478</td><td>King</td><td>82.00</td><td>Kolman</td><td>29/07/91</td></tr><tr><td>354</td><td>King</td><td>82.00</td><td>Taylor</td><td>27/07/91</td></tr><tr><td>355</td><td>King</td><td>82.00</td><td>Taylor</td><td>22/07/91</td></tr><tr><td>318</td><td>WaterBed</td><td>104.00</td><td>Petrillo</td><td>22/07/91</td></tr><tr><td>600</td><td>WaterBed</td><td>104.00</td><td>Kerry</td><td></td></tr><tr><td>234</td><td>King</td><td>82.00</td><td>McSweeney</td><td>26/07/91</td></tr></tbody></table> <p>9 rows in set (0.003 sec)</p>	ROOMS	Bed Type	Rate	Current Guest	Leave Date	365	WaterBed	104.00	Ferguson	29/07/91	444	King	82.00	Curtis	26/07/91	222	WaterBed	104.00	O'Brien	23/07/91	478	King	82.00	Kolman	29/07/91	354	King	82.00	Taylor	27/07/91	355	King	82.00	Taylor	22/07/91	318	WaterBed	104.00	Petrillo	22/07/91	600	WaterBed	104.00	Kerry		234	King	82.00	McSweeney	26/07/91
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V15.1.0.0403	91599	PCL2PDF – Correct handling of delta row compression raster images																																																		
V15.1.0.0404	91594	<p>New verb EESEARCH to allow searching of all, selected or single files for character strings</p> <h2>EESEARCH</h2> <p>Searches a single file, a list of files or all files in current account for specified character strings. The differences between similar verbs are shown below</p> <p>FIND Locates files with an item ID of the required field</p> <p>ESEARCH Locates an item within the named file that contains the given string</p> <p>EESEARCH Will locate items with the required ID or any items which contain the given string</p> <h2>Syntax</h2> <p>EESEARCH {filename} {(options)}</p> <h2>Syntax elements</h2> <p>Filename This is the file name to be searched. An asterisk can be used to signify all accounts. If a select list is active, the filename is not necessary and is ignored. If the file name is omitted and no select list is active then a No items present error is generated.</p> <h2>Prompts</h2> <p>STRING:</p> <p>Enter a character string and press RETURN. The prompt is repeated until only RETURN is pressed. The total character strings entered can consist of up to 500 characters.</p> <p>Double quotes should not be entered.</p>																																																		

Options

- A** ANDs string together. Items must contain all specified strings.
- F** Include the item-id in the search.
- N** Selects only those items that do not contain the specified string(s).
- O** Sort the resulting matched items in a file alphabetically. Searching large files will slow the process if this option is used.
- R** Suppresses the Item not on file message that is generated if no items are selected.
- U** Specifies that case is significant when comparing strings.
- W** Specifies that case should be ignored when comparing strings.

Comments

As the search can involve a large amount of data and/or items, the user has a number of opportunities to abort sections of the search using certain keystrokes.

Control-X aborts the search and immediately returns to TCL.

Control-Y aborts the search of the current file data section and begins searching the next data section.

The process will check for the use of selected keystrokes before processing a file and after each batch of 500 items in the file.

The name of the file and data section currently being processed is displayed to provide an indication of the progress.

DataBasic object code is not searched.

Case Sensitivity

If neither **U** nor **W** is specified, the current data case setting (set with the DATA.CC environment option or the CASE TCL command) is used. See Case Sensitivity for more details.

If both **U** and **W** are specified an error message is displayed and results are generated.

Example 1

```
:EESEARCH * (WF
```

```
STRING: Henn  
STRING: Mc
```

```
BP  
BP RESET-DEMO
```

```
GUESTS  
GUESTS 143
```

		<pre>GUESTS 234 PAYMENT-CODES PAYMENT-CODES MC SAVE.GUESTS SAVE.GUESTS 143 SAVE.GUESTS 234 6 Items listed.</pre> <p>In this example, all files on the current account (HOTEL in this example) are searched for any items containing any of the terms Henn or Mc regardless of case including the item id. The returned results show the file name, data section and item id of those matching items.</p> <h3>Example 2</h3> <pre>:LOGTO ACCOUNT1 :CASE [1315] Case sensitive. :EESEARCH SQL (A STRING ABC123 STRING DEF456 STRING : STOCK ORDERS ORD001 ORDERS ORD099 INVOICES INV004 3 Items listed.</pre> <p>In this example, all files on the current account (ACCOUNT1) are searched for any items containing both the terms ABC123 and DEF456 using the case sensitively of the database (sensitive).</p>
15.1.0.0405	91597	<p>Enhancements to GENML/SGENML to output formats json, html, csv or XML</p> <h2>GENML, SGENML</h2> <p>GENML generates an English listing in the same way as LIST. However, the result is embedded in an optional template specified by the user and saved to a file item.</p> <p>SGENML is similar, but its output is in item-id order unless sort criteria specify otherwise.</p>

Syntax

```
GENML file-specifier {item-list} {selection-criteria} {USING
file-specifier} {sort-criteria} {output-specification}
{format-specification} {macro-call} {(options)}
```

```
SGENML file-specifier {item-list} {selection-criteria} {USING
file-specifier} {sort-criteria} {output-specification}
{format-specification} {macro-call} {(options)}
```

Refer to [Sentence_Structure](#) for descriptions of these parameters.

Options

- F** Defines items
- P** Sends the listing to the printer. You will not be prompted for an output file or item.
- T** Sends the output to the terminal. You will not be prompted for an output file or item.
- X** Requests the output type for the results. This can be HTML (the default if none is given), JSON or XML.

If the **X** option is specified, the following prompt is displayed

```
Conversion type:
```

The valid responses are HTML, JSON, XML or <RETURN> . If <RETURN> is pressed, the default of HTML is used. If an invalid type is given, an "Item not on file error" is displayed and the type requested again.

Operation

When executed, the **GENML** and **SGENML** commands prompt an optional format type (see option **X**), the file and item into which to save the generated results, and for the file and item containing the template into which the Reality data will be embedded.

For example:

```
:GENML EMP ID-SUPP TITLE EMPNO WITH EMPNO = "02]"
Template file name or <RETURN> for default:HTML
Template item name:EMPTEMPLATE
Output file name:MYDIRVIEW

Output item name:emp.htm
```

This selects data from the file EMP and outputs the attributes identified by TITLE and EMPNO, suppressing the item-id (the TITLE and EMPNO [data definition items](#) use the **XT** conversion code). The output is embedded in the template item EMPTEMPLATE in the file HTML and saved in item emp.htm in the file MYDIRVIEW.

Note that if you press RETURN at the Template file name prompt, you are not prompted for a template item. Instead a simple default template is used.

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		<p>The P and T options respectively send the generated output to the printer and terminal. If you specify either of these options.</p> <p>F Uses a template item containing placeholders that will be replaced by the relevant values in the columns from the data. Each row of data will create an item in the specified file or if the output is to the screen or printer, a continuous listing. This overrides the X option and the supply of a template file and item is mandatory. This allows the user more detailed formatting of the generated data.</p> <p>The template item uses placeholders to indicate where values from a row of data will appear. The placeholders are formatted as <code><%n%></code> where <i>n</i> is the number of the column to show the value from. For example, if a row of data consists of <code>123 VM ABC VM 456</code> and the template contains <code><%3%>~<%2%>~<%1%></code>, the resulting data will be <code>456~ABC~123</code>. Any placeholders that are greater than the maximum number of columns in the data will not be changed.</p> <p>If the output is to a file, the requested output item id will be used to create unique item ids in the file. The entered value will generate an id consisting of the value from the first column of a row of data suffixed with a dot then the entered id. For example, if the value in the first column contains <code>123</code> and the entered id is <code>ABC</code> then the resulting id of <code>123.ABC</code> will be generated. A supplied id containing an asterisk signifies the position of the first columns value in the generated id. For example, an entered id of <code>ABC-*-DEF</code> would result in an id of <code>ABC-123-DEF</code> being used. The asterisk can be used any number of times and each occurrence will be replaced with the first columns value</p>						
V15.1.0.0406	91600	<p>New verb SLS to perform log file reporting and maintenance</p> <h2>SLS</h2> <p>Within Reality there are many SYSTEM LOGS - these may grow, using disk space, slowing save/restore routines etc.</p> <p>This new verb allows such data to be removed with optional reporting during the removal process.</p> <h2>Syntax</h2> <pre>SLS LOG <lower date>,<upper date></pre> <p>Dates must not contain spaces</p> <h2>Options</h2> <table><tr><td>R</td><td>Delete matches items</td></tr><tr><td>D</td><td>Detailed listing</td></tr><tr><td>S</td><td>Summary listing (default)</td></tr></table> <p>If an upper date is supplied then the comma is required.</p> <p>Where LOG can be</p>	R	Delete matches items	D	Detailed listing	S	Summary listing (default)
R	Delete matches items							
D	Detailed listing							
S	Summary listing (default)							

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		ALL	All logs
		SER	Services logs
		ACC	Accounting log
		PHH	TIPH log
		DBD	DataBasic Debugger Dumps
		TCL	TCL Audit log

Reality V15.3

Product Updates

Reality V15.3 service pack released 15th February 2021

V15.1.0.0407	91601	Enable build of reality on Centos 8/Move to Reality V15.3 <ul style="list-style-type: none">Fix 407 will move Reality to V15.3. When a DBUPDATE is used, the majority of the fixes will already be incorporated into the database and items such as ERRMSG 335, features etc. will be updated to read V15.3.Fix 407 must be installed before building Reality with Centos 8
V15.1.0.0408	91606	Correct error handling in tlmenu
V15.1.0.0409	91608	Amendment to realclone -pu to ensure all files are copied rather than just changes
V15.1.0.0410	91610	Correct handling of Instances under Centos

The following fixes were released on 9th Sept 2022

V15.1.0.0411	91612	Ensure PCL2PDF uses the Java Language Server as the default connection
V15.1.0.0412	91611	New version of DELETE-ACCOUNT verb to behave as original if run from PROC by PH. Fixes issue in SYS-UPDATE
V15.1.0.0413	91572	Enhancement to DECRYPT/ENCRYPT to add algorithms for SHA, AES and other openSSL ENCRYPT Function Two new encryption methods are now supported Method 7 This provides access to the openSSL message digest algorithms for MD4, MD5, MDC2, RIPEMD160, whirlpool, SHA0, SHA1, SHA224, SHA256, SHA384 & SHA512. The algorithm to use is passed as the key parameter of the function. The returned data is binary so care must be taken to process values such as character 255 that may occur in the result. Method 8 This provides access to the openSSL ciphers for AES-128-CBC, AES-192-CBC, AES-256-CBC, DES-CBC and DES-EDE3-CBC. The cipher, key (in hex) and initialisation vector (in hex) are passed as an attribute separated list in the key parameter. The returned data is binary so care must be taken to process values such as character 255 that may occur in the result. Examples <pre>DIGEST = ENCRYPT("HELLO WORLD", "SHA512", 7) HEX = "" FOR A = 1 TO LEN(DIGEST) HEX:=DTX(SEQ(DIGEST[A,1]))"R%2" NEXT A PRINT DOWNCASE(HEX)</pre> Displays: 13d6c73ac8ccee9ff9ff6b0ba2ce19c5fc47ac21f9fd403c151fe88e0fd39f4223c29bc9bded59e1e3f272fd969fd6e2e6e35be35072e742c4b36fec48feb87df

Sets DIGEST to the SHA512 digest of the string "HELLO WORLD" and then displays the result in hexadecimal (variable HEX). This example takes into account that the resulting digest contains the character 255 (FF).

```
IV = OCONV("16 characters!?#", "MCAX")
KEY = OCONV("Thirty Two character secret key!", "MCAX")
CIPHER = "AES-256-CBC"
DIGEST = ENCRYPT("HELLO WORLD", CIPHER:@AM:KEY:@AM:IV, 8)
HEX = ""
FOR A = 1 TO LEN(DIGEST)
    HEX:=DTX(SEQ(DIGEST[A,1]))"R%2"
NEXT A
PRINT DOWNCASE(HEX)
```

Displays: de1ab4f1df9fa6831c3cf59abea09200

Sets DIGEST to the result of applying the AES-256-AES cipher to encrypt the string "HELLO WORLD" using a secret key (KEY) and an initialisation vector (IV) and then displays the result in hexadecimal (variable HEX). This example takes into account that the resulting digest may contain the character 255 (FF).

DECRYPT Function

Two new decryption methods are now supported

Method 7

Decrypting a digest is not possible so this function will return a null value

Method 8

This provides access to the openssl ciphers such as AES-128-CBC, AES-192-CBC, AES-256-CBC, DES-CBC and DES-EDE3-CBC. The cipher, key (in hex) and initialisation vector (in hex) are passed as an attribute separated list in the key parameter. The passed string is binary (as returned from a corresponding ENCRYPT). The returned data is binary so care must be taken to process values such as character 255 that may occur in the result.

Examples

```
DIGEST = OCONV("DE1AB4F1DF9FA6831C3CF59ABEA09200", "MCXA")
IV = OCONV("16 characters!?#", "MCAX")
KEY = OCONV("Thirty Two character secret key!", "MCAX")
CIPHER = "AES-256-CBC"
MSG = DECRYPT(DIGEST, CIPHER:@AM:KEY:@AM:IV, 8)
PRINT MSG
```

Displays: HELLO WORLD

Sets MSG to the result of applying the AES-256-AES cipher to decrypt the digest (DIGEST) using a secret key (KEY) and an initialisation vector (IV) and then displays the result. The digest is originally in hexadecimal so is converted to a binary string before being passed to the DECRYPT function.

V15.3 Product Updates

V15.1.0.0414	91614	Intercall functions added (U2-VIEW and U2-SET) to allow pointers to a U2 database.
V15.1.0.0415	91617	Fix for issue with incorrect scale being applied for SQL-VIEW numeric and decimal columns
V15.1.0.0416	91618	U2-CHANGE verb added, to allow U2-VIEWS to enable password amendment with U2-VIEW'S
V15.1.0.0417	91619	SET-FILE reinstated - only relevant to new databases. The verb had been removed from mkdbase but would still be there in mkdbase -r
V15.1.0.0418	91620	DELETE-FILE syntax corrected and improved error checking
V15.1.0.0419	91615	Rebranded to NEC Software Solutions UK Limited
V15.1.0.0420	85973	Fix for tlmenu perl warnings when selecting to save a database with transaction handling