



Runtime Software Release Notes

Version: 2017.12

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1 2017 Highlights

1.1 2017 Release Highlights

1.2 All Runtime Products

1.2.1 IMPORTANT NOTE REGARDING UPGRADING TO 2017

Once a project is migrated to 2017, reverting to a 2016.09 release for that project is not supported. That is, the swd directory is not backwards compatible. If reverting to 2016.09 is desired, customers are advised to create a backup of the swd directory prior to upgrading to the 2017 release.

2 2017.12 Update 2 Release Notes

2.1 2017.12 Update 2 Release Notes

2.1.1 The Following Release Items are for All Altair Runtime Products

Support Case #	Internal Tracking #	Description
New Features		
		No new features were generated that apply to all Runtime products
Enhanced Features		
	8960	Error messages generated from Tcl code are now suffixed with a tag of the form: [filename:line_number] This helps track down the source of the error. (This is similar to the same tag info generated from error messages from compiled code). In verbose mode, the Tcl filename is replaced with the full pathname of the file.
22020	8766	When copying the <swd>/vovnginxd/conf/nginx.conf.template file to an nginx.conf file, a message is output to the server log indicating that a copy is being made, and also specifying the source and destination files.
Fixed Bugs		
		No bugfixes were generated that apply to all Runtime products.

2.1.2 The Following 2017.12 Update 2 Release Items are for FlowTracer

No changes were generated that apply to FlowTracer.

2.1.3 The Following 2017.12 Release Update 2 Items are for LicenseAllocator

No changes were generated that apply to LicenseAllocator.

2.1.4 The Following 2017.12 Release Update 2 Items are for LicenseMonitor

No changes were generated that apply to LicenseMonitor.

2.1.5 The Following 2017.12 Release Update 2 Items are for NetworkComputer

No changes were generated that apply to NetworkComputer.

2.1.6 The Following 2017.12 Release Update 2 Items are for WorkloadXelerator

Support Case #	Internal Tracking #	Description
New Features		
23221	9087	Added an optional liveness script that can be used to monitor the vovwxd daemon to look for blocking conditions based on the bucket service time. If configured, the script can capture an strace of the vovwxd daemon process and also restart vovwxd. These behaviors are controlled by the VOV_WX_STUCK_VOVWXD_AGE, VOV_WX_STUCK_VOVWXD_STRACE, and VOV_WX_STUCK_VOVWXD_RESTART environment variables, all of which would be set in the wx.swd/setup.tcl file. The age can be specified in timespec or seconds format. The other variables act as on switches if they are set to any value.
	8955	vovwxd will log time metrics for every slave in following format: <pre>Metrics for slave nc_nc171_000097881. Was created for bucket 137519. Last job ID 000137517 Bucket last addition: Fri Jul 20 04:58:56 2018 (29 sec ago).</pre>

		<p>The bucket no longer exists Launcher job was created Fri Jul 20 04:58:59 2018 (26 sec ago). Slave queued Fri Jul 20 04:59:05 2018 (20 sec ago). Slave connected Fri Jul 20 04:59:05 2018 (20 sec ago).</p>
Enhanced Features		
		No enhanced features were generated for WorkloadXelerator.
23117	9038	Added the CREATIONTS and FIRSTDISPATCH fields to the bucket object. The time delta between these two fields can be used to calculate the WX slave start delay for each bucket.
	9134	<p>The following parameters have been added to vovwxd config:</p> <p>CONFIG(log,path) specifies the log file path for vovwxd daemon</p> <p>CONFIG(slaveLog,older) vovwxd will remove slave logs that are older than the specified value</p> <p>CONFIG(slaveLog,path) custom directory for WX slave logs</p> <p>CONFIG(launchers,checkfreq) specifies how often should vovwxd scan the logs directory to remove old files</p>
Fixed Bugs		
23151	9071	If for any reason vov commands (including launcher jobs in WX) cannot write into stdout channel, the output will be written in a new temp file located in /tmp or /var/tmp directory. The file name will be stdout_[pid].log. The location can be changed via VOV_STDOUT_FAILOVER_DIR environment variable.
23171	9078	<ul style="list-style-type: none"> • Fixed a bug that was causing vovwxd daemon to become unresponsive and not handling WX jobs • Improved vovwxd logs for some truncated messages
23143	9053	The REQ* fields will now return accurate values for jobs that are not running.
23221	9101	vovwxd will dequeue a user job if WX was failed to request a slave from base NC because of a user error like bad FS group name, or long command line. The error text will be added to "LAUNCHER_ERROR" property of the user job.
22801	8895	Fixed the creation of Launcher job's output directory with invalid permissions. The current directory (swd/vovwxd/launchers/<date>) will not be deleted when vovwxd deletes old log files. It is recommended to set CONFIG(launchers,older) parameter not less than 1d.
22939	8968	WXLaunchers set is now protected from being deleted by "vovforget -allemptysets" command. vovwxd will re-create a deleted WXLaunchers set when needed.
23139	9046	A problem where the command 'vovforget -oldlimits' incurred a vovselect error on the 'STARTDATE' field has been fixed.

3 2017.12 Update 1 Patch 1 Release Notes

3.1 2017.12 Update 1 Patch 1 Release Notes

3.1.1 The Following Release Items are for All Runtime Products

No changes were generated that apply to All Runtime products.

3.1.2 The Following 2017.12 Update 1 Patch 1 Release Items are for FlowTracer

No changes were generated that apply to FlowTracer.

3.1.3 The Following 2017.12 Update 1 Patch 1 Release Items are for LicenseAllocator

No changes were generated that apply to LicenseAllocator.

3.1.4 The Following 2017.12 Update 1 Patch 1 Release Items are for LicenseMonitor

No changes were generated that apply to LicenseMonitor.

3.1.5 The Following 2017.12 Update 1 Patch 1 Release Items are for NetworkComputer

No changes were generated for NetworkComputer.

3.1.6 The Following 2017.12 Update 1 Patch 1 Release Items are for WorkloadXcelerator

Support Case #	Internal Tracking #	Description
New Features		
		No new features were generated for WorkloadXcelerator.
Enhanced Features		
		No enhanced features were generated for WorkloadXcelerator.
Fixed Bugs		
22801	8895	Fixed the creation of Launcher job's output directory with invalid permissions. The current directory (swd/vovwx/launchers/<date>) will not be deleted when vovwx deletes old log files. It is recommended to set CONFIG(launchers,older) parameter not less than 1d.
22939	8968	WXLlaunchers set is now protected from being deleted by "vovforget -allemptysets" command. vovwx will re-create a deleted WXLlaunchers set when needed.

3.1.7 The Following 2017.12 Update 1 Patch 1 Release Items are for HERO

No changes were generated for HERO.

4 2017.12 Update 1 Release Notes

4.1 2017.12 Update 1 Release Notes

4.1.1 The Following Release Items are for All Runtime Products

No changes were generated that apply to All Runtime products.

4.1.2 The Following 2017.12 Update 1 Release Items are for FlowTracer

Support Case #	Internal Tracking #	Description
New Features		
		No new features were generated for FlowTracer.
Enhanced Features		
	7357	Changed rounding of timeleft field on slaves to be more fine-grained. Previously, it would round 31 minutes to 60 minutes. The new algorithm rounds 31 minutes to 32 minutes. The rounding algorithm is explained in the slavetimeleft.html page. The impact of more fine-grained rounding is slightly increased network traffic between the slave and server.
Fixed Bugs		
		No bugfixes were generated for FlowTracer.

4.1.3 The Following 2017.12 Update 1 Release Items are for LicenseAllocator

Support Case #	Internal Tracking #	Description
New Features		
		No new features were generated for LicenseAllocator.
Enhanced Features		
20899	7572	LicenseAllocator now supports failover for high availability.
Fixed Bugs		
22737	8864	Fixed by ensuring that the features do not get detached from the resource map upon querying details of the resource.

4.1.4 The Following 2017.12 Update 1 Release Items are for LicenseMonitor

No changes were generated that apply to LicenseMonitor.

4.1.5 The Following 2017.12 Update 1 Release Items are for NetworkComputer

No changes were generated for NetworkComputer.

4.1.6 The Following 2017.12 Update 1 Release Items are for WorkloadXcelerator

Support Case #	Internal Tracking #	Description
New Features		
		No new features were generated for WorkloadXcelerator.
Enhanced Features		
22691	8835	The warning about reaching maximum of allowed slaves will have the following format: Number of allowed slaves has reached limit. Slaves currently in use: 3

		<pre> Current slave limit based on: WX Server config(maxNormalClients): 8000 CONFIG(slaves,max): 100 CONFIG(client,derate): 50 CONFIG(slave,maxSlavesPerBucketNumberPerNCQueue): 3 Number of WX server clients: 9 Available file descriptors: 2457 Consider increasing maxNormalClients in WX server, or max. slaves in vovwxd config. </pre> <p>WX will print all config parameters that can have an impact on the slaves number limit. In this example CONFIG(slave,maxSlavesPerBucketPerNCQueue) parameter is limiting the total number of slaves for the current bucket.</p>
Fixed Bugs		
22300	8754	Fixed false positives of slave churn detections, and the warning message is reduced at INFO level.
22610	8807	WX will maintain the processing order of job class and "-g" fsgroup parameters. As a result the slave job in a base queue will have the same fsgroup as the WX job.
22773	8878	Fixed problem with SNAPSHOT environments that caused environment variables to get added in subsequent jobs but never removed. Now it uses the correct environment from the shell that launched the job, plus the environment specific to each job. The bug impacted vovslave but not vovslaveroot.
	8821	In WX, it is safe to specify a VOV_JOB_DESC(autokill) parameter in a jobclass. The parameter will only be applied to the WX job and not to the job in base NC queue.
	8868	WX will now create agent jobs running in the same OS group as the original user job's.

4.1.7 The Following 2017.12 Update 1 Release Items are for HERO

No changes were generated for HERO.

5 2017.12 Release Notes

5.1 2017.12 Release Notes

5.1.1 The Following Release Items are for All Runtime Products

Support Case #	Internal Tracking #	Description
New Features		
		No new features were generated that apply to all Runtime products
Enhanced Features		
20367	5392	Resource expressions now support lists of typed resources in place of OR, e.g.: <code>nc run -r User:abc,User:def -- sleep 10</code> Additionally the AND, OR and NOT keywords are now case-insensitive.
Fixed Bugs		
13650	5896	Prevent duplicate daemons from running if more than one instance is started during the same second.

5.1.2 The Following 2017.12 Release Items are for FlowTracer

Support Case #	Internal Tracking #	Description
New Features		
		No new features were generated for FlowTracer.
Enhanced Features		
		No enhanced features were generated for FlowTracer.
	8374	Limit the number of node editor IO tabs to prevent hangs or crashes if the number is very high. Moved retrace priority and flags into preferences so they can be saved to home or project.
Fixed Bugs		
22036	8261	Fixed a problem with editing jobs from the browser UI when the command line uses single quote characters.
	4827	Fixed drawing speed on Mac for vovconsole, node editor, vov monitors, vovconsole preferences, and a few other GUI elements. The slowness was mainly seen when using XQuartz on OSX.
22713	8569	We have added a new environment variable, VOV_SLAVE_SID_DISABLE. If this variable is set to 1, vovslave and vovslaveroot will not create new sessions (and consequently will not create new process groups) on startup.

5.1.3 The Following 2017.12 Release Items are for LicenseAllocator

No changes were generated that apply to LicenseAllocator.

5.1.4 The Following 2017.12 Release Items are for LicenseMonitor

Support Case #	Internal Tracking #	Description
New Features		
		No new features were generated for LicenseMonitor.
Enhanced Features		
		No enhanced features were generated for LicenseMonitor.
Fixed Bugs		
	8647	Fixed issue in "ftlm_accounts dumpmemberships" utility that caused group memberships to be displayed for users not in those groups.

5.1.5 The Following 2017.12 Release Items are for NetworkComputer

Support Case #	Internal Tracking #	Description
New Features		
		No new features were generated for NetworkComputer.
Enhanced Features		
	8414	The messaging in vsy and related commands has been improved to clarify the potential source of resource cycles.
22239	8644	To prevent excessive server load due to too many OR clauses in resource map sums, calls to vtk_resourcemap_sum from <swd>vovresourced/config.tcl are now limited to expressions of up to 5 ORs (by default). The default limit can be adjusted by setting RESD(maxORsInResourceSum) in <swd>/vovresourced/config.tcl. If a resource sum with excessive ORs is seen, an alert is generated and an error message is output once per day in the vovresourced logfile.
Fixed Bugs		
21983	8233	Messaging in vsy, nc info and related commands has been changed to clarify which resources are actually missing when the user specifies OR clauses in the resource request.
21098	7643	Fixed issue that caused jobs submitted through the LSF emulation layer to result in a SLEEPING state due to an output conflict caused by the use of the -o option to bsub.

5.1.6 The Following 2017.12 Release Items are for WorkloadXcelerator

Support Case #	Internal Tracking #	Description
New Features		
		No new features were generated for WorkloadXcelerator.
Enhanced Features		
22312	8723	Fix job queue page to show the total records available.
Fixed Bugs		
22301	8712	Improved parsing of launcher jobs output. vovvxd will extract only job IDs from the output of nc run command.
22297	8708	Fixed bug on WX bucket web page showing the accurate number of web links, that are matching to CONFIG(queues) list.
22296	8707	The NC: prefix is removed from NC web links on the WX bucket page.
22295	8706	WX will use the config(ssl.enable) setting from the backend NC policy.tcl file.
22311	8721	In WX, the slave jobs running in NC, will always run in CONFIG(slave,env) environment, which is "BASE" by default. Submitting jobs in WX with a job class (-C) will not have any effect to the slave job environment.

6 2017 Base Release

6.1 2017 Release Notes

6.1.1 The Following Release Items are for All Runtime Products

Support Case #	Internal Tracking #	Description
New Features		
		No new features were generated that apply to all Runtime products.
Enhanced Features		
20540	7340	Added ability to specify the maximum number of jobs a slave may execute. This is accomplished via: -m option to the vovslave/vovslaveroot executable. -maxjobs option to vtk_slave_set_defaults/vtk_slave_define. Both options take an integer as the value.
	6549	to_be_supplied
20367	5392	Resource expressions now support lists of typed resources in place of OR, e.g.: <code>nc run -r User:abc,User:def -- sleep 10</code> Additionally the AND, OR and NOT keywords are now case-insensitive.
12709	5566	Replaced all DNS lookup calls that used gethostbyname with the more modern getaddrinfo function. This should increase the reliability of lookups to find the IP of a host by name.
	6233	Improved the way numbers are encoded in network packets. This reduced the network traffic by 30 % for many server services. Also when big packets are sent such as vtk_cache_set, the service time on server time is reduced up to 30%. This capability is turned both sides of server and client by default. Implemented compression capability for protocol. Compression takes extra time on server side. But for remote clients, the communication time can be cut down significantly. For big data results to serve commands like vovselect, nc list, the compression reduces the size of packets up to 90%. To enable compression, set environment variable <code>VOV_CLIENT_PROTOCOL_COMPRESS 1</code> before run the client such as vovsh and vovslave.
20730	6929	Added a new autostop facility for automating script calls upon vovserver shutdown, analogous to the autostart facility that is called upon vovserver startup. To enable, create a directory named autostop in the server working directory and place a Tcl script inside. For Unix, csh scripts are supported as well. The facility can be called manually at the CLI via the vovautostop utility as well. During autostop script processing, job dispatching is disabled.
	6948	Added server debug flag to journal all changes made by sanity. This flag is enabled by running "vtk_server_config trace_debug_flag 32". Once enabled, the server journal will contain messages about each action taken by sanity, along with timestamps. These messages can be used to help understand when and why sanity made changes.
21390	6969	<p>Significant changes have been made to licensing in an effort to improve reliability and reduce the impact of license server downtime on our products:</p> <ol style="list-style-type: none"> 1. Switched to a new communication model that prevents the need for a constant connection with the RLM license server. When vovserver comes up, it will request a license. If successful, vovserver will disconnect from the license server and attempt to reconnect on an hourly basis to refresh the checkout. If at any point the refresh fails, there will be a 5-day time window to allow the license administrator to correct the license server issue. If the issue is not resolved after 5 days, the vovserver will enter a license violation state. 2. Slaves can no longer directly request licenses and instead use the vovserver as a proxy for becoming licensed. 3. The rtdad daemon has been deprecated, replaced by a simpler rtdad.set file that co-exists with the license file. 4. Node-locked licenses are now RLM-based, but still do not require a license server to run, similar to the previous license key file behavior. 5. A new vovlicensemgr utility has been added that can be used to show/check the internal status of licensing, as well as acquire and release licenses. 6. Upcoming license expirations are made more visible by generating alerts, beginning at 30 days prior to the earliest detect expiration. <p>Note that a new license file is required in order to be fully compatible with these changes.</p>
15423	6979	STARTTIME, IDLETIME, MAXIDLE, MAXIDLELEFT fields have been added in vovquery for slave object. STARTTIME represents the actual start time of a slave instance. IDLETIME is the duration in seconds passed since the last job has been executed on that slave. MAXIDLE shows the value of -z option AGE, LASTADDITION, LASTDISPATCH fields are added for BUCKETS object. The RANK value can be obtained with "FS_RANK" field.
20080	7197	IMPORTANT: The license grace period functionality has been removed due to a technical limitation. The software issues alerts 30/14/7/1d prior to the earliest expiration detected (in case there are multiple lines of the same license feature in the same license file). Licensing robustness and network fault-tolerance have been significantly

		improved. The software can operate in "disconnect mode", which means that it connects, gets a checkout, then disconnects from the license server. Checkout is refreshed every hour. The software will not fail for until 5 full days have passed since the last successful checkout. Alerts are issued for this as well. As before, license servers may be specified as a colon-separated list via the RLM_LICENSE environment variable.
	7271	Upgraded licensing manager software to RLM 12.2BL2.
	7338	The vovlicensemgr utility can now be used to manage vovserver licensing. The available actions are: acquire, check, release, and show.
	7359	Timestamp directory in the vovslave log path is removed. All log files of daemons are moved to logs directory. (created symlink logs to the new directory and symlink daemon_name.log to the latest log file) -vovsearchlog utility is provided to search for patterns in the log files.
20684	7453	The vovbrowser command now shows the value of VOV_HOST_HTTP_NAME, if this is set, in the project URL.
	7895	Added @NAME@ field to jobs (transition object). This field returns @JOBNAME@ if it has content and @COMMAND@ otherwise. Also added @NAMEORCOMMAND@ field which is equivalent to the legacy usage of @NAME@@COMMAND@ to get either the name (for files) or command (for jobs). Both @NAME@ and @NAMEORCOMMAND@ support field width specifiers to limit the length of the command returned. For example: @NAMEORCOMMAND:45@ will return the first 45 characters of the command.
21504	7936	to_be_supplied
	8131	Added option -rule to command vovset show. Example: % vovset show -rule status==FAILED System:jobs
	8476	Persistent slaves not yet started now have a status of REQUESTED as opposed to DOWN. Persistent slaves that have disconnected now have a status of DEAD.
	5298	The LA, LM, NC, or WX projects must be created or started by using the appropriate *mgr script. Prompt for confirmation if user attempts to create/start such a project directly using vovproject.
Fixed Bugs		
	8510	Fixes a crash caused by a query comparing a field to a string using the <, <=, > or >= operators, e.g. "vovselect id from jobs where id>abc". Fixes another crash caused by comparing integer fields to floating-point values, or floating-point fields to integer values, e.g. "vovselect id from jobs where id>1000.1".
	6737	Fixed issue that resulted in a randomly encountered Tcl error when piping VOV command output into the Unix head utility.
	7478	Prevent license violation messages from interfering with shutting down a Runtime product server.
	7754	Improved NC and LM boot script templates to provide configurability over the web and guest ports, as well as other general cleanup. Also added a new boot script template for WorkloadXcelerator (S99wx).
	7874	improved output format of vovshow -clients.
6494	3994	Added documentation for limits on path lengths, command fields, set names, file names, environment lengths, and more. Included details about characters that can be used for sets and commands.
	5103	The Tcl procedure vtk_select_loop now properly handles Tcl keywords break, return, and error.
	5884	When the autoflow/skip flag is turned off, always invalid the job and downcone. Previously, some methods of turning off the autoflow flag would invalidate the downcone (such as the shortcut key in vovconsole) but others would not (for example, vtk_transition_set and clicking the skip flag in node editor).
	6954	Python interface to REST API example: <pre>import sys sys.path.append('/path/to/vovdir/scripts/python') import rtda_rest rtda_client = rtda_rest.RTDARest() obj = rtda_client.getUrl("http://ncserver:6271/api/v1/jobs/424737/status") print ("Return type is", type(obj)) print ("Return val: ", obj)</pre> Install requests module for Python3: sudo easy_install requests Run with Python3: python3.5 ./resttest.py The output will be something similar to: Return type is <class 'str'> Return val: {"startrow":1,"endrow":1,"query":" SELECT status FROM jobs WHERE idint=="424737","errmsg":"","columns":[{"col":0,"field":"status"}], "rows":[{"RETRACING}]}
	7156	Fixed issue that caused the graph to stay empty when doing a vovbuild after forgetting all nodes in the graph. Now it immediately updates. In addition, the timing for events between the server and client has been reduced when the number of clients is 10 or less or if the previous event handler loop took a short amount of time for all clients. Previously, it could take up to 2 seconds for some events to be shown by the client (VovConsole). Now, it should not take longer than 0.2 seconds unless many events are coming in at once, in which case it waits for them all to come in before updating to keep the GUI responsive.
21474	7224	Prevent the deletion of previous metric data files upon auto-save of the current in-memory data.
	7316	Fixed Tcl error when attempting to stop a product that is in a license violation state.
	7687	fixed vovset clear option to work.
	7752	There is a new server configuration parameter, "slaveheartbeat". This parameter will act as a default setting for a slave's update interval (it can be overridden by "vovslavemgr configure -update"). Values are expressed in seconds and the valid range is 1-300, with a default of 60 seconds.
	7761	

		fixed protocol error caused by security violation which happens when users with low authority (not admin) try to do 'vovslavemgr stop'
21377	7887	Clarified documentation of VOV_LIMIT_vmemoryuse
	8148	Running "sanity" from a client (console, vovsh, vovproject sanity, html page, vtk_sanity_check), now requires ADMIN privileges to run. For FlowTracer, LEADER privileges are also allowed. When a client runs "sanity", a message is added to the server log with the user, host, client class, client nickname, product version, process ID, and security level of the client from which it was initiated.

6.1.2 The Following Release Items are for FlowTracer

Support Case #	Internal Tracking #	Description
New Features		
	7923	Prior to this change, setting VOV_VW_VERBOSE to a nonzero value would cause the vw/vov wrapper to create a file called .vw2_pid_%d_verbose.out that had verbose messages from the wrapper. Using the -v option would add some messages, but not as many as using VOV_VW_VERBOSE because many of the messages would get piped to /dev/null. In addition, VOV_VW_LOGNAME could be used to modify the name of the file for the verbose output. After this change, the VOV_VW_VERBOSE setting still creates the file and VOV_VW_LOGNAME can still be used to change the name, but now, using -v also does the same thing. Setting VOV_VW_VERBOSE=3 in the environment is equivalent to using "-v -v -v" as options to vw/vov. In addition, if VOV_VW_VERBOSE is 3 or greater, or 3 or more "-v" arguments are passed, an additional file called ".vw2_pid_%d_verbose_env.out" gets written with the full contents of the environment and equivalences used for the job. The VOV_VW_ENV_LOGNAME environment variable can be used to change the name of this file. Since a job can potentially run on different operating systems, the equivalences may vary depending on which machine the job was run on. The environment, however, should be the same on different machines.
	7967	Simplified the internal data structures that deal with jobs that read and write the same file, such as a database. Past releases used something called chains of places. This has been replaced with "inplace shared outputs". When a file is both an input and an output, the output is marked as "inputoutput". The input is detached. In the place of the input, a phantom file is inserted in its place as an automatic dependency ("autodependency") to maintain the connections to the upcone.
Enhanced Features		
20732	5668	We support the following new features for stopping and suspending jobs: The -signal, -include and -exclude options to "nc stop" and "vovstop -f" are now functional. The trace parameters "defaultStopSignalCascade" and "defaultSuspendSignalCascade" have been added to specify default behavior when requesting to stop or suspend a job, respectively. The job property STOP_SIGNALS can now be used to set stop-signal cascades on a per-job basis.
	6512	The time to wait after losing connection to vovserver before attempting to reconnect can be specified in the policy.tcl file using the config parameter slave.maxWaitToReconnect.
21613	7968	vovwxd slave log deletion is done in a separate process
	5157	Generate events to clients and journal when policy values get changed through editing policy.tcl or vtk_server_config
	5354	When there are no nodes in the set being displayed in the node graph, show a message indicating such. Also, if there are hidden files, add a message with the shortcut key to show the files.
12489	5441	Summary bar of sets in the Set Viewer now contains separate bars for files and jobs. Show Files must be enabled to see the status summary for files in the set.
	5551	Close All NodeEditors and Close All Navigators menus are added under Console->Window menu of vovconsole
	6150	Added capability to customize the right-click menu in the set browser in VovConsole. This was added in 2016.09.
	6380	VovConsole now provides convenient toolbar buttons and keyboard shortcuts to display or hide files in a set, including stdout and stderr files. When displaying a known set that can only show files or jobs, those nodes are show automatically, irrespective of the current setting of these buttons.
	8094	improved searching with quick find by making it much more responsive, faster in searching, and with better support for search patterns with spaces and regexes.
	8095	Improved Find dialog in FlowTracer. Added support for searching by ID, prevent Tcl error when clicking on empty result list, added result counts and coloring to show if there were more matches that were not shown, added message if there were no matches, persist between sessions so search text and can be re-used.
	8096	Improved object persistence during FlowTracer crash recovery. Added "PLACE MODIFY" events that get saved to the CR file. Added origin of attachments to "NODE CONNECT" events. These allow restoring origins of attachments and place flags during crash recovery. Fixed bug with disconnect events during recovery to prevent things appearing attached even though they were recently detached.
15044	6547	Previously, if changes were made in the NodeEditor and the ESC key was pressed, any unsaved changes would be lost. Following this change, when ESC is pressed, if there are unsaved changes, a confirmation dialog pops up to ask if the NodeEditor is to be closed without saving changes.
	6874	Added back support for geometry editing in FlowTracer. This feature is not available in 2016.09 versions.

	6956	Sped up graphing of sets with many job and dependencies. Sped up incremental build on sets that are currently being viewed.
15602	6973	Command, environment, path and resource lengths are now checked against their maximum lengths when adding a transition. The current maximum lengths (in characters) are: <ul style="list-style-type: none"> • Command: 40960 • Environment Spec: 512 • Path: 1024 • Resource Spec: 1024 Parameters greater than these lengths will result in the job being rejected.
21501	7069	"STOP" action on a running job will check the ACL permissions for the user attempting to stop the job. A LEADER will no longer be allowed to stop other people's jobs if LEADER does not have STOP permission in ACL.
	8144	Taking ownership of a job which has X11_DISPLAY set will change the display to the new owner's DISPLAY environment variable. If the new owner had previously taken ownership of the job, the old saved value will be reused.
Bugfixes		
20729	6396	vtk_select_get and vtk_select_loop is improved to retrieve query results in dynamic sizes of chunks to prevent buffer overflow.
14929	6466	Fixed issues causing server log to include messages about "Unexpected status: not orange or yellow". One issue was that vov_job_xterm needed to set the dependency origin. Another was that the origin was not being restored in crash recovery. Both of those are fixed.
21521	7536	Fixed issue with too many arrows between sets when building or re-building the flow while viewing the parent set. Now it recomputes the arrows between sets when events that could modify those arrows occur.
21242	7825	Fixed issue where some subslave warning and error messages were getting lost (not printed to any logs). Now, these issues get propagated to the WHY property of the job.
21609	7966	The API will detect an invalid ACTION such as START and give an error message, instead of silently returning incorrect result.
21722	8033	When starting an xterm, we want to have the project enabled but also pick up aliases and such from the users .cshrc or .profile (bash) file in their home dir. We also want .Xauthority from their home dir to make sure we can bring up the xterm. To do this, we fake the HOME dir temporarily. For this to work with multiple users, I create a subdirectory in the swd for each user (\$swd/.xterm_home/\$USER). There, I symlink the default .cshrc or .profile from the \$swd and also the Xauthority from the home dir. The default .cshrc (or .profile) sources the user's home dir version, then sources the VOVDIR setup file and enables the project. This leaves the user with a full login shell, complete with aliases, but ensures the correct VOVDIR and VOV_PROJECT_NAME are set up and enabled. Previously, the fake HOME dir was set to the SWD dir but since the Xauthority is linked, that did not work for multi-user. Hence, the added layer of subdirectories per user.
	8354	Disabled failover for FlowTracer. In the event of a server crash, the slave logs used to show some messages about failover (where the slave hosts choose a new host to re-launch the server). Now, that is disabled and those messages do not show up in the slave log.
	8512	to_be_supplied
	4813	Node->connectivity->Inputs, Outputs work on the selected nodes. Previously, it was working on the set that the selected nodes belong to. The menus are added to popup menus, too.
20275	5040	The environment variables VOV_NISRETRYCT and VOV_NISRETRYWAIT can now be used to configure the number of attempts to make and the number of seconds to wait between a failed attempt and the next attempt when querying a host's name services to determine the current username. Default values: 3 attempts, 3-second wait between attempts.
	5093	Fixed issues with barriers being invalidated by stopping propagation of INVALID to the downcone of a job or file when barriers are encountered.
12009	5278	vtk_nodestatus_set_color api function is added to change node status colors. Use vtk_transition_color_control to change transition(job) node since transition colors depends on exit code.
	5335	When floating a Set Viewer tab from vovconsole, Show Files and Show stdout/stderr Files settings are carried over from the main set viewer tab to the floated tab.
12902	5368	Performance and accountability improvements when running "sanity".
	6506	Fixed bug with caching of neighbors of nodes when viewing a graph. In the past, it would sometimes not show arrows when nodes were added incrementally to a graph. Now, the arrows properly show up.
	6520	Fixed Tcl error that occurred when bringing up a file from the LINK database in node editor. Now, there is no Tcl error.
	6685	Improved responsiveness of detecting when the mouse is moved over nodes in FlowTracer and NC GUI. This prevents having to move the mouse off and on the node to get it to show the popup text for the node.
	6835	Fixed a case where the "barrier invalid" flag would not get properly cleared when the path between the barrier and the node was broken by detaching or forgetting something in that path.
	6836	When a node is attached as an output to a node with the barrier invalid flag set, propagate the barrier invalid flag to the output node and the downcone.

	6837	When running the timestamp consistency check in sanity, do not check the timestamp of input files that are barriers. This prevents invalidating the downcone of a barrier that was not opened when the timestamp of the barrier file was changed. For example, if a job with an output barrier is invalidated and runs again, the output barrier may get updated but the contents might not have changed (such as in an md5 barrier with no change to the md5sum). But the timestamp gets updated. In that case, the downcone should not invalidate due to the timestamp change. This change prevents that invalidation from happening.
	6959	Prevent hangs in vovconsole when large numbers of jobs or files are being forgotten in a short period of time.
	6976	When files are compressed automatically, do not shrink the size of the node in the FlowTracer graph since it makes the arrows point to empty space.
15861	7083	vovvxd triggers alert if previously submitted slave is failed in back end batch system
	7158	In both the tabs in Node Editor and VovConsole, prevent moving the "+" tab (the one on the right). Fixed a couple of minor bugs involving moving the other tabs, including one that made it jump back and forth between 2 tabs when dragging one of the tabs slowly. Prevent any tabs from going past the "+" tab on the right.
20549	7355	Increased the maximum number of dependency levels in a FlowTracer flow graph from 1024 to 4096.
20797	7525	Added 2 options to the wrapper, mainly for disabling capsules. -z ignores capsules -Z ignores capsules and also does not include the tool itself as an input The environment variable VOV_VW_ALLOW_CAPSULES=0 can also be used to disable capsules. The (pre-existing) env variable VOV_VW_EXE_DB=NONE can be used to disable the tool from being included as an input. Now, the "clean" way to run the wrapper, where only VovInputs, VovOutputs, and stderr/stdout are included as inputs and outputs, is to run "vov -Z". Alternatively, set those 2 env vars. That method can be used more globally, such as in an environment, to avoid having to change the command everywhere.
20976	7610	Fixed labels on jobs and files in FlowTracer and nc gui so the text does not overflow the borders of jobs or files.
	7904	When a job is run more than once and the stdout/stderr content changes, always update the contents in node editor.
21852	8100	LEADERS can also add alerts and echo logs, not just ADMINS
21920	8143	"vovdaemonmgr show" will show the status of all instances of vovlsfd connected/configured against the current project, across all users of the project.
	8212	Check whether running in FlowTracer multi-user mode or not, and display vovlsfd information for the user logged into the web UI.
	8366	When a node editor window is opened, the node that was double clicked in the graph is highlighted with a moving dashed border. Also, when the node editor window is entered with the mouse, the node flashes again. This feature already existed, but it has been enhanced to highlight the node in all graph windows.
	8378	to be supplied
	8388	to be supplied
	8389	Removed redundant sanity messages about propagating VALID status to SELF from server logs.
	8467	Documented the possible slave states. States are described in the slave introduction page of each product's administrator guide.
	6909	Fixed bug that sometimes made nodes in FlowTracer have incorrect border colors.
	7554	When propagating status from jobs to files or files to jobs due to connecting inputs or outputs, or due to evolving the trace based on job success or failure, make sure an appropriate status is propagated. For example, files can not be FAILED and jobs can not be MISSING. In those cases, choose a status that makes sense. FAILED jobs result in INVALID output files. MISSING files result in INVALID downcone jobs.
	7555	When jobs and files are attached (with declareInput or declareOutput), before this change it would pass the status of one to the other. Now, it looks at the status of the job and file as well as the file's optional and shared properties, and determines the appropriate status to propagate to the file. In many cases, it also invalidates the downcone of the file due to the attachment.
	7731	Prevent FlowTracer from printing messages that say "Failed to copy spline from edge" when splines are automatically disabled due to having too many edges in the graph.
21684	8002	When VOV_FT_MULTIUSER environment variable is set before launching a slave, the slave will only accept jobs owned by the same user who started the slave. Jobs owned by other users will be refused.
	5112	Fixed bug in AD FDL procedure (artificial dependency) so that it will no longer re-use an existing phantom dependency if any special flags exist on that dependency. Special flags are: <ul style="list-style-type: none"> • \$isbarrier • \$islog • \$striggerrun • \$striggerstop
	5559	Fixed issue with node editor where changing I/O, including stdout and stderr, was not properly updated in the I/O tabs. Now, it updates correctly when files are added, removed, or updated. It also correctly finds stdout/stderr filenames that were computed using a non-default value of VOV_STDOUT_SPEC.
Tasks		
	7938	Added documentation for ADD_INPUTTAB and ADD_OUTPUTTAB properties which are used to add custom tabs to the node editor.

8413	Crash recovery is not available on FlowTracer any longer.
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6.1.3 The Following Release Items are for HERO

Support Case #	Internal Tracking #	Description
New Features		
		No New Features were generated for HERO.
Enhanced Features		
		No Enhanced Features were generated for HERO.
Bugfixes		
	8164	Enhanced exit-status-based auto-rescheduling to avoid any host (or slave, configurable) that has already been tried for a specific job and has resulted in failure.

6.1.4 The Following Release Items are for LicenseAllocator

Support Case #	Internal Tracking #	Description
New Features		
	6893	LicenseAllocator can now allocate licenses across any combination of NetworkComputer instances and LSF or OpenLava clusters.
Enhanced Features		
20896	7574	If a site is slow to respond, LA will continue to allocate tokens to it for 3 cycles. If the site doesn't respond for 3 consecutive cycles, then it is marked DOWN and LA will stop allocating tokens to it.
20900	7582	LA can be asked to automatically detect an LM or NC instances by project name, if they exist in the same registry.
21403	7840	LA will log web UI actions that change the LA operations to the server log.
21505	7901	All historical plots will show a line for "total" tokens. Queued plots will include a line for vendor queued. Running plots will indicate times ranges where overbooking was on or handle matching was on.
	6896	On the overview page, the resources that are Resource Groups are clearly marked with a special symbol in the resource name column.
	7589	The LA::SetMinQuantity now accepts NO_MIN mnemonic and LA::SetMaxQuantity accepts NO_MAX mnemonic. Use of -1 to mean NO_MIN and NO_MAX in these commands is deprecated.
	7985	LA will keep track of how many tokens are actually critical for a critical site, and use this information to make allocation decisions. Hovering over the critical icon in the web UI will display the actual number of critical tokens. The number of critical tokens and users who have critical jobs can be obtained by using fields CRITICALCOUNT and CRITICALUSERS on the vovselect or vtk_select_ commands.
	7993	If allocations are not consumed for a few minutes, they are throttled back gradually. With this change, there is no need for vovla_allocmodulation script any more. The throttling can be disabled by policy param la.adjustForUnconsumed.enable.
21741	8057	The number of critical tokens and users who have critical jobs can be obtained by using fields CRITICALCOUNT and CRITICALUSERS on the vovselect or vtk_select_ command on LAALLOCATIONS object.
Bugfixes		
20898	7575	Fixed the metrics license check, and use the correct date if an alert is needed.
	6894	Sorting by column in the Overview page in the "Active Resources" view doesn't take you back to the "All Resources" view.
21410	7883	LA will preserve the historical data for the duration specified through the policy parameter metrics.keepFilesPeriod. The data will be loaded on the fly upon demand and combined with live data from the server before being displayed in the plots page of the UI. Please remove the command ReloadHistoricalData from LA's config.tcl file, if it exists.
21738	8058	Removed the unnecessary debug message from the log, so it is printed only when the appropriate debug flag is turned on.

6.1.5 The Following Release Items are for LicenseMonitor

Support Case #	Internal Tracking #	Description
New Features		
		No New Features were generated for LicenseMonitor.
Enhanced Features		
20839	5724	

		Increased the vovserver almost-full free disk space threshold from 1MB to 1GB. Added a new percentage-based check as well, which defaults to a 1% threshold. Both thresholds are configurable via the following server configuration parameters defined in the policy.tcl file: <code>diskspacecheck.minfreemb (default=1000, min=1, max=50000)</code> <code>diskspacecheck.minfreeperecent (default=1, min=1, max=50)</code> Increased the vovslave almost-full free disk space threshold from 5MB to 100MB. This can be overridden via the <code>-mindisk</code> option to <code>vtk_slave_set_defaults</code> and/or <code>vtk_slave_define</code> . Added a new notification health check (<code>doTestHealthServerDiskSpace</code>) so that email notifications will be sent in addition to the alerts and log messages that are generated.
20354	6970	Allow for failover of LM when used with NC. The NC vovresourced daemon will now locate the host and port of LM by using the product registry if configured to do so. This is done by setting the <code>LM(licmon)</code> setting in the vovresourced configuration file to the name of the LM instance, and making sure that the <code>LM(flexlmd)</code> setting that normally contains the LM host and port information is not set. If <code>LM(flexlmd)</code> is set, the location specified therein will be honored as before. Additionally, a new configuration parameter, <code>LM(enabled)</code> , has been added to provide the ability to disable communications between vovresourced and LM altogether. The data type of this parameter is boolean and the default value is true.
	7311	Added PID to current checkouts report (detailed view).
Bugfixes		
20324	7269	Sanitize single quote characters found in strings obtained by license server parsers. The following SQL command can be used to sanitize records already in the database: <code>vovsql_query -rw -x "update hosts set name='joes-host' where name='joe"s-host'"</code> The key to this statement is escaping each single quote with another single quote in the where clause (<code>joe's-host</code> becomes <code>joes-host</code>).
21399	7851	Provide control over whether the <code>-r</code> option is used for the DSLS parser, since it appears to not work in certain versions of the DSLicSrv client. This option is used to indicate that the server is running in restricted mode.
14129	6102	Enhanced flexlm subfeature parsing performance by adding a preprocessing procedure.
15522	6960	If running an SFD without elevated administrator privileges, show a warning that makes it clear that Windows service support is disabled.
	7073	Fixed issue that prevented Immgr from starting LicenseMonitor with a port specification of 'any'.
21400	7836	Action button "Stop" will show when the report is in any of the following status: RETRACING, RUNNING, SCHEDULED, SUSPENDED.

6.1.6 The Following Release Items are for NetworkComputer

Support Case #	Internal Tracking #	Description
New Features		
12541	5459	Improvements to the metrics subsystem, including new support for using data files for monitoring heavily-loaded vovserver instances (<code>\$VOVDIR/etc/config/metrics</code>). Add ability for GUI to pull metrics data from files, spanning multiple to service the requested report in employed. Period can be set via the policy.tcl file using the <code>metrics.keepFilesPeriod</code> parameter. Add ability to configure save frequency metrics manually using the vovmetric CLI utility. Add ability to auto-save metrics independent of trace saving. Add new <code>vtkwave_duplicate</code> Add ability to query subsystem status using the vovmetric CLI utility.
	6991	Added new JetStreams feature that accelerates queue bucket processing by reusing a previously used slave for subsequent jobs in the following setting in policy.tcl: <code>set config(jetstreams.enable) 0</code>
Enhanced Features		
20586	7408	Fairshare configure page now displays actions for a group based on user's permission on that group.
	7476	Now non-admin user is not allowed to perform server setup/configuration function/actions such as database (change configuration directly).
20618	7529	Reservation is now a VovObject, which means reservations can be queried with <code>vovselect</code> , are saved persistently(PR), and go into slave. <code>vovslavemgr reserveshow</code> is improved. <code>vovshow -reservations</code> , <code>vovforget -allreservations</code> , <code>vovforget reservationId</code> could be used. APIs are added as well.
20583	4823	Added new hog protection for users with more currently-managed jobs than a configurable threshold, that when breached, will result in the following defined in the policy.tcl. All job states are considered. This protection can be enabled and configured via the following server configuration: <ul style="list-style-type: none"> • <code>hog.protection.enable</code> (default=0, which is off) • <code>hog.protection.jobcountthreshold</code> (default=100000, min=1000, max=999999) • <code>hog.protection.clientdelay</code> (default=1, min=1, max=600, specified in seconds)
15159	6644	As of the 2017 release, there is a new optional argument to <code>vovslavemgr</code> , <code>-sendenv</code> . This argument allows you to send any named environment variables to the slave. <code>jupiter -sendenv BASE</code>
20343	7239	When vovserver issues errors or alerts about running out of disk space and having trouble writing a file, always tell the full path of the file.
21236	7748	Generate both an event and a server log entry when a FairShare group is changed. Event example: <code>27 FSGROUP CHANGE 000553805 1507566658 (/test, by joe@localhost SERVER: Window 1h00m to 2h00m) Log</code>
21030	4897	FairShare configuration page now permits direct weight entry.
20587	7388	<code>nc hosts</code> and <code>vovslavemgr reserveshow</code> commands are upgraded according to the new reservation features.
	7857	Improved reservations of resources: now they are persistent and queried with <code>vovselect</code> like slave reservations.

		Bugfixes
20136	3765	The nc run command now supports an option to control the number of times a job can be rescheduled. Thus: <code>-maxresched <N></code> implemented via the <code>MAX_RESCCHEDULE</code> property on the job.
	6748	Server checks locked info file as a routine task. If the file is updated by another server, the server exits.
	6761	Provide a clear way of identifying dedicated failover slaves, which are designated via the <code>-failover</code> option to <code>vtk_slave_define</code> , by for
20122	7189	Generate an alert in NetworkComputer when a monitored license is no longer found by LicenseMonitor.
20789	7509	The <code>vovclientmgr</code> utility now has a "closedeadinteractive" action, which allows the user to close clients that have interactive jobs tha
21549	7946	Prevent the server from checking the existence of SNAPSHOT environment files for NC and WX to prevent long file access times f
21929	8170	Added parameter <code>resmap.sw.types</code> with default value "License Limit Policy User Group Priority"
	8180	to_be_supplied
21965	8198	Improved the "why" message for jobs that are invalid or failed due to a dependency to be more meaningful. For NC, it now includes about the input file as well as the <code>upcone</code> job which has the file as an output.
	8287	to_be_supplied
22006	8475	Jobs with a negated resource containing a colon character were unexpectedly dispatched instead of queueing. This has been corre
12742	5590	to_be_supplied
	7110	Client displays proper message and exits when it cannot connect to server and <code>VOV_RELIABLE_TIMEOUT</code> is not set.
	7286	When server is slow to respond or there is event buffer overflow, <code>clients(vovconsole, nc gui)</code> closes notify connection. This is where
20613	7394	FairShare group modification logging has been enabled for non-admin users.
20607	7407	Corrected the logfile field value in the <code>nc getfield</code> output when a job is submitted with the <code>-nolog</code> option. The logfile field now display
20590	7639	The command line tool <code>vovslavemgr</code> no longer attempts to start a slave that is already running.
21473	7882	Fixed issue that caused hosts to lose information such as frequency, cores, and RAM after doing a sanity. Now the data is recompu now it gets the information back properly.
21780	8059	Cancel creating new preemption rule goes back to the main preemption page.
	8101	to_be_supplied
	8179	The output of "vsv", "nc why", "wx why" and related commands now explicitly states which slavelist is being analyzed (unless no sl
22090	8352	A case where the <code>partialTool</code> script could exit unexpectedly has been fixed.
21204	7617	"Show all jobs" link now has been made to work as intended.
21021	7630	 in the NC jobs for user page is for a separate line for each tool info, now is made to work as intended

6.1.7 The Following Release Items are for WorkloadXelerator

Support Case #	Internal Tracking #	Description
New Features		
	8181	Improved buckets web UI page to contain more workload data, and support filtering/sorting/exporting of the table.
Enhanced Features		
14821	6353	WX will trigger an alert, and stop submitting new slaves for a bucket, if previously submitted slaves do not get any job from that bucket because of resource mismatch or any other reason.
20393	7275	Added capability to override the <code>vncConfig</code> directory location. This is done via the <code>NC_CONFIG_DIR</code> environment variable. This location must be a shared network location that all clients can read. The default location is <code>\$VOVDIR/local/vncConfig</code> . Because the configuration is created by <code>ncmgr/wxmgr</code> , the variable must be set before running those utilities to create a queue. Afterward, the variable must be set in the admin-defined, shell-specific <code>vovsetup.csh/sh/tcl</code> script (Unix), or <code>vovinit.bat</code> (Windows) in <code>\$VOVDIR/local</code> , or otherwise in all user environments, such as through a <code>.cshrc/.bashrc</code> script.
	7981	WX launcher job environment can now be overridden from the default (BASE), or what is configured in the batch system driver script, by requesting a special "LauncherEnv:foo" resource on jobs, where "foo" is the named environment desired.
	8108	to_be_supplied
	8152	When viewing a job, the node editor now displays the name of the slave that last executed the job, as well as the bucket ID, if the job is currently queued.
	8333	Added Reserved For information in Slave Compatibility web page. If the slave is reserved for john, the information shows "Reserved - USER:JOHN" now.
Bugfixes		
20014	6743	In WX a job class name can now contain '_' symbol. It is safe to perform a check from the job class script for an existence of a "Limit:" resource before adding it to the list.
	6811	to_be_supplied
	8172	to_be_supplied
	8515	Fixed problem that caused all bucket ages to be displayed as 0 in the workload web UI page (<code>buckets.cgi</code>).
20843	7602	Slaves with a max lifetime should exit at the beginning of the second instead of the end, in order to prevent jobs from landing on the slave as it is exiting.
	8422	

		Added support for searching for buckets by ID in the smart search function of the web UI. Also added minor formatting improvements.
	8423	Add EXTLINKS for configured base queues and ensure the vov ID substitution in node.cgi points to the NC queue for WX slave jobs.
	8217	Fixed subcommand "migrate" as in "nc migrate", which is used for certain types of preemption.
	8434	Fixes issue in WX where the slave compatibility page was blank when an NC SlaveList was being used for the job being analyzed.
	8463	Click "stop" or "start" action on listed projects from Web UI works again.
Tasks		
	7960	Added documentation for Job Modulation in WX