PDF Guide

Guide to the RPM 6.2 Release

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RPM 6.2 Release

We have scheduled a new product release for RPM Remote Print Manager® ("RPM") for July 2018. This release has been in process since August 2017 and includes a tremendous number of additions and updates.

This PDF version of the guide condenses the online pages into a single document, should that be more useful for your review.

New LPD module

LPD has been the print protocol utilized across the Internet since some time before 1990. RPM of course has handled LPD since its beginning.

With this release, we set about to create a new LPD module which focused on reliability, clarity, and performance. Internally we call it "lpd2" since it's a new architecture, at least in the way we put it together. It's not strictly the second iteration but the second we've done since the RPM 5.0 version which was a complete rewrite of everything.

Here are the main considerations for this new LPD handling module.

SUPPORT FOR MICROSOFT BYTE COUNTING   Probably nothing has tripped us up as much as setting up a Microsoft "print to LPR" port for use with a printer, only to find jobs not processing in RPM. Now when a job data size claims to be 4GB or more, we assume it's probably from an LPR client which didn't want to spool the print job so that it can send a byte count first. That's perfectly fine; we know what to do.

MULTIPLE CONTROL AND DATA FILES   We now handle multiple control files in a job, and multiple data files, and combinations thereof. Some Linux clients use this as a way of sending multiple print jobs on a single connection. It's faster than opening a new connection for each print job and it's perfectly legal.

SUPPORT FOR AS/400 EXTENSIONS   RPM now supports AS/400 specific LPD sub-commands. We have also supported extended control file attributes for years now.

LPD STREAM SUPPORT   RPM supports the so-called "LPD stream" where the data

size is said to be zero. This is another way of handling the "don't count the data bytes first" problem.

INTRODUCED CAPTURE SUPPORT   We've added a "capture" feature which writes the overhead part of the LPD protocol to a file, which we can then replay. This is intended to help us understand unexpected job behavior not related to the actual data. It does not (at this writing) include the actual job data, rather a representation which we can use to synthesize a fake job.

END OF DATA ISSUES   We added support to resolve a problem we've seen at the end of extremely large jobs, where sometimes the end of the job data didn't arrive with the rest of the data. We coaxed it a bit and now it works as expected.

CONTROL FILE ORDER   We had put a lot of attention into handling all the parts of the LPD job without relying on order, only to find that if the control file came first, it was overriding the size of the data file when it comes to the final job record, the one that appears in the UI. The actual size of the data file was unaffected. This is fixed.

FIXED NULL CHARACTER ISSUE   Some print clients, notoriously the Microsoft LPR client, append a null character to the control file and the data file. We meant to trim that NULL character from the data like we did in the previous RPM but apparently missed coffee that day. This is now fixed. This was apparently causing problems for some clients using the Raw Print action, depending of course on the printer.

Also, if there are "extra" bytes like that NULL appended to either the control or data files, we now mention this in the diagnostic log.

UNEXPECTED CHARACTERS IN NAMES   We now account for non-ASCII characters in the control file names. Some Linux clients increment a character without apparent limitation if you send multiple files on a single print request.

LPSTAT RESULTS   The following changes were made to the lpstat response.

> » We were transmitting the results of "lpstat" commands but the clients weren't getting them. We got our act together and now both Linux and the Windows "lpstat" clients receive our output.

> » We added a status message to the result like we did with RPM 4.5

> » We also remove the column headers if no jobs are listed.

> » You can control whether RPM sends actual job results from "lpstat" using a setting in the UI. It is off by default.

SMALL JOB REMOVAL   The user interface lets you set a minimum size for jobs; any job that size or less is supposed to be removed. Unfortunately, we were merely leaving them in the "xfer" state. Now they are automatically removed as they were supposed to be.

NON-ASCII JOB NAMES   If the job name in the control file is not ASCII or UTF-8 we attempt to use the system's native code page to translate the name to UTF-8. If that fails we'll replace non-ASCII characters with an underscore. This should not affect the job processing, and you can use data extraction to override the job name.

Networking Updates

Networking is a core area of RPM and something we put a lot of focus on.

In this release, we introduced a new "LPD" module. We completely rewrote the way we handle incoming LPD requests and how we created the jobs. The page to the left of this includes the highlights and we will document the new functionality thoroughly.

However, we did a lot in the networking part of the system outside of LPD, which we describe here.

NEW NETWORK PRINT ACTIONS   RPM supports two network print actions: LPR and IP. That is, we receive, and we also send out. In this release we replaced the old implementations for these outputs with all new code. Our goal was code that responded quickly and yet let us know of potential problems. In testing, we have sent tens of thousands of jobs through those actions. We have tested this with RPM in our local network and with our various printers.

This code has been available for several beta releases. For a very brief window of time the new Print LPR was sending jobs to the same host they came from, which of course we fixed immediately.

NETWORK "DISTANCE RELIEF"   A client was experiencing unexpected problems with jobs sent from a considerable networking "distance". Some jobs randomly seemed to never complete. It turns out that their client system was sending "write" and "close" events at the same time. We had never seen this but found a way to account for it. This seemed to solve their problem.

TELNET ISSUES   If you started with a clean database, the telnet manager would fault because it's next job ID was not specified as expected. This is fixed.

If the job name template was blank, incoming jobs would produce a fault. The telnet manager now provides a default template for creating a name if none is specified. This has also been fixed in the UI.

When RPM starts up it will now look for empty data files and abandoned data files for prior telnet sessions

OTHER ISSUES   The socket for "lpstat" commands is now shut down proactively which helps keep the LPD jobs processing at a steady rate

Eliminated a frequent call to check on listening ports, which occasionally failed for unknown reasons and resulted in RPM reporting that it's own path is using the port. This required a system reboot to fix.

Job Processing

After your print job arrives in RPM it is scheduled to process. We made a number of improvements and fixes to print job processing.

TRANSFORMS EXCEPTION EXECUTION   We did a major rework on the way transforms are processed, if the queue has more than one active action, or if the job has copies. The processing is now much more reliable, and in some instances much faster (although correctness and completeness are always the goals). If you had a situation with errors like "empty result from transforms" then you probably need this update.

INTEL CPU BUG   In light of the widely reported Intel CPU bugs, RPM now explicitly zeroes decrypted password fields immediately after using them, rather than merely letting them pop off the execution stack, just in case that makes some difference. We suspect it does not.

DATA EXTRACTION UPDATES   You can now use values from data extraction in the command line for filter actions and filter transforms

The text banner transform now supports data extraction

If you search for multiple patterns, the earlier iteration of data transform would concatenate those values and return them in the data field you specified. This functionality is restored.

The data extraction transform now properly initializes all the fields you intend to look for, so if the value you want is not found, the field will be empty rather than uninitialized

Fixed a problem with positional search in data extraction when jobs have blank lines, it was throwing off the line numbering.

PCL5 UPDATE   In the Text Markup to PCL transform, we added a PJL command for the job name to the existing command to display the job name on the printer status window; and the "ENTER LANGUAGE" command to help distinguish from PCLXL.

PCL RESOURCE UPDATES

» Added "copies" support to the PCL Resource transform
» Added support for PCLXL to the PCL Resource transform

PERFORMANCE STATS   Added performance statistics for actions and transforms to the "report.txt" file RPM generates on each run. This file can be found in the install folder.

NON-ASCII JOB NAMES   We solved a problem where a job name with non-ASCII characters was not being added, or displayed in the UI, or processed correctly.

LINE LENGTH PROBLEM   We discovered that the "text to text markup" transform, which is essential to many processing schemes, was calculating the line length incorrectly if the line contained overstrikes.

STRING TRANSLATION PROBLEMS

» If the pattern you were searching for contained a NULL byte, which might include a wild card with a NULL byte in the result, AND if the pattern spanned

a buffer boundary, we were not keeping the correct number of bytes in reserve for searching the next buffer. This problem applied to partial matches, and it is fixed.

» We also discovered that if you have a string translate transform followed by a remove markup transform, the "end of text" marker disappeared. This is also fixed.

TRANFORM ERROR LOG   Resolved a situation where transform errors were logged repeatedly and prevented the job from being declared unsuccessful.

FILTER TRANSFORM OUTPUT   Fixed a problem with the filter transform where it might not read the specified output file.

FILTER ACTION ARGUMENTS   Some filter action arguments were being "quoted" when we didn't want them to be.

LARGE FILES ON WINDOWS 10   Identified and resolved an unusual race condition with very large input files (90 MB or more) on Windows 10.

FILE COPY ON WINDOWS 10   We were using a new method of copying files which unfortunately exposed a race condition in Windows 10, when the source path is a different drive than the destination, so we went back to our old method.

Text Printing

From the beginning, RPM's ability to render text on a Windows printer has set it apart from nearly all other solutions. Text printing is a fundamental process which we continue to invest in.

OVERLAYS

» If you specify overlays for a text print, they now appear on page 1 only if you wanted it to

» Furthermore, if an overlay was supposed to appear on page 1, the text was not printing

» It was possible to configure printing with overlays without actually configuring the overlays

END PAGE ERROR   Windows was reporting an error in "End-Page" for some print drivers but we were able to work around this.

TOP MARGIN   We corrected a problem where the first line of text in a file could print above the configured margin.

BLANK PAGE HANDLING   RPM has always had a "suppress blank page" feature which somehow slipped through the cracks in the previous release. It has been restored to its rightful place.

BLANK JOB   If a print job was entirely white space, it never finished printing even though it didn't print anything. This is fixed.

More Job Handling

JOB ERROR HANDLING   We have greatly improved the retry process. Each job now has its own retry count and we added a "max retries" to the UI. This value defaults to five. We also have a retry frequency to specify how long to wait between attempts.

We have seen customer systems where jobs have continually retried, without anyone realizing, for as long as five months. Others reported they had enough jobs retrying that it prevented new jobs from processing.

JOB REPRINT   Added "reprint" notification to the job pump, which means if RPM reprints jobs for any reason, the effect is immediate and not potentially delayed up to ten seconds

When the user reprints a job, RPM will reset the "job retry count" on that job. This way if you make changes of any kind to fix whatever was causing the job to retry, doing a reprint will give you a new set of retries for that job.

If one or more actions are disabled for a job, and you reprinted it, it could attempt to keep printing forever. This is fixed.

JOB RETENTION   Jobs with a Remove Time set are removed by RPM on startup, when that time is in the past; in other words, RPM was not running when the job was scheduled to be removed normally. This is part of the job retention system.

Database Updates

RPM relies heavily on the database since all jobs, configuration, and logs are stored there. Following are the updates in database processing since the last release.

MESSAGE LOG   The message log now adds log entries in a separate thread, so that logging will not slow down the other processing substantially. You can even turn on high detail with a far lower performance penalty. Much of course depends on your computing environment.

We tracked a substantial memory leak to the message log code and eliminated a third party library to resolve the problem.

PRIORITIES TABLE   After a customer sent us their database file, we discovered that the PRIORITIES table had literally thousands of entries for queues and devices which no longer existed. We added cleanup for the PRIORITIES table in RPM startup, and added handlers for whenever a queue or device is removed.

QUEUESEQ TABLE   We discovered that the QUEUESEQ table was not properly updated after an RPM upgrade from a previous version. The system was unable to generate a job ID when creating new jobs. This is a fairly serious show-stopper error. We added code to check the QUEUESEQ table on startup and ensure that it was error free.

DATABASE RECOVERY   We found some database transactions which invoked an error in the database which we were not recovering from. We found a way to report these errors safely. They are currently being reported in the RPM events log.

DBMIGRATE   Dbmigrate will now migrate the database if the file exists in the default location, even if we are not upgrading RPM.

Logging Updates

RPM logs everything of interest, in various levels of detail. We log when jobs arrive, when they are processed, and of course all manner of errors and warnings. We also have a diagnostic log which can be useful to our staff.

MESSAGE CONTENT IMPROVEMENTS   We studied some massive customer logs and identified a number of ways our logs could be more useful for problem resolution, or simply identifying normal behavior. In general, we added contextual data to many log messages:

» We now associate a queue name with a device name in the device tester logs, so if you use the same device in multiple queues (a typical situation) you can track down which setup you need to check

» We added a device name or folder path to device tester logs.

MESSAGE LOG CLEANUP   We discovered that the message log insert was attempting to purge old log entries each time we added. We eliminated that overhead and added a scheduled task within RPM that would purge old log entries each hour. You can set the duration of log messages in the user interface.

This significantly reduced the impact of logging.

JOB EXECUTION LOGGING   We added real-time logging for job execution. We use a custom script to accomplish this. We do not plan to release a tool publicly.

PCL5 LOGGING

» The PCL Resource mapping transform logs all trays and bins in the input file to the event log once, at the end of the file. Previously it logged each occurrence.

» The "missing macro" warning for PCL5 files is now logged once at the end of the input files. All missing macro ids are listed.

» We now list the job name and macro ID for any PCL macro related messages, if you have turned on logging for that transform.

WINDOWS VERSION LOGGING   We added support to log the operating system version for Windows 10 and Windows Server 2016.

User Interface Updates

The User Interface, or the "UI" as we usually call it, plays an essential role in RPM. While the majority of the actual work goes on out of sight in the RPM service, the UI is where you keep an eye on things, watch jobs processing, look for errors and warnings, and do all the configuration.

REMOTE HOST CONNECTION   Not everyone knows that the UI can connect to RPM running on another host in your network. We disabled some functions which don't make sense when you are connected to a remote host, including:

- » View Job Files
- » View Contents
- » Open folder containing a job
- » Clean Spool Folders
- » Email to Support (a feature to email a job data file)
- » Dependent Services (refers to services on your computer that might depend on the RPM service running)
- » Add-on Modules (must be configured locally)
- » Diagnostic Logging (requires modifying an XML file in the install folder)

SERVICE CONNECTION ICON   We updated the "connected to service" icon in the lower right corner to a larger, more readily identifiable image.

TASK AVAILABILITY NUMBERS   We removed the task availability numbers since they were always out of date (by the time they get to the UI) and often confusing.

QUEUE REMOVAL SAFEGUARDS   When the user wants to remove a queue, we now check first that the queue is not used in a telnet port and is not the target of a copy queue action.

DUPLICATE RPC PORT   We now prevent the port configuration from adding a duplicate RPC port.

TELNET PORT UPDATE   We now require the telnet port configuration to have a job name template and a queue destination.

JOB DISCARD   We modified the wording of the "job discard option" to be more clear.

CAPTURE   We added "capture" support to the LPD settings. If enabled, our new LPD protocol module will generate a capture file for each incoming job and place it in the "JOBS" folder in the RPM spool area. The "capture" file contains only the protocol exchange and not job data.

QUEUE FILTERS ON STARTUP   We added a command line argument to the UI to pre-load the "queue filters" field. This will narrow down the list of queues automatically displayed in the UI. You can always clear the filter at any time.

DATABASE MAINTENANCE   If the UI is stopping the service for database maintenance, proactively check that the service actually stopped correctly.

CODE PAGE TRANSFORM   The code page transform was missing from the transforms list. It was automatically used by some transforms, but you were unable to add one as intended.

TEXT BANNER TRANSFORM   The text banner transform was not allowing you to save the form if a template file was not configured. This is optional again as it should have been.

QUEUE FOLDERS   The queue folders setup now requires the parent folder to be a local drive, not shared. There are several reasons for this, the most obvious being that directory notifications are not broadcast over the network to neighboring Windows systems.

BLANK PRINTER NAME   The printer list for the Raw Print action no longer includes a blank printer name.

STARDARD INPUT & STANDARD OUTPUT IN FILTERS

- » you can't use "standard input" and include the %s parameter in the command line
- » you can't use "standard output" and include the %o parameter in the command line

For users who don't fully understand these concepts, they are diametrically opposed meaning you can use one or the other but not both. The form now checks if the user is trying to use both and prevents it.

More Updates

INSTALLER

» Don't remove the service and re-add during an upgrade which should prevent some unnecessary reboots

» The upgrade process no longer upgrades RPM version 4.5 since Windows XP was its last supported version

» The installer no longer runs on Windows XP as we have officially dropped RPM support for that platform

» We now set 4 specific values in the diagnostic log settings to "true" on install and update. The purpose is to facilitate basic diagnostics on service startup and shutdown.

REMOTE FTP   Remote FTP sessions were timing out and terminating sooner than the user had configured.

JETPCL   The vendor provided us with a new version of their demo software and is available on our website if you need.

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