



Pacific Knowledge Systems

**RippleDown Log File Management User Guide:
v8.0.5**

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The PKS Software is intended to be used purely as a decision support system that provides complementary reports for patient data to qualified individuals based upon established rules set up by relevant trained customer domain experts (hereafter referred to as "domain experts").

The PKS Software generates and collates comments into a patient centric report or workflow action based on rules created and maintained by domain experts. The PKS software presents all first-of-a-kind reports for review, modification (if applicable) and approval by the domain expert prior to release to clinicians or other individuals. Beyond this, the domain expert may automate the release of none, some or all identical reports. However, since a report may be generated and automatically approved for a case for which the domain expert has not previously considered, it is intended that the domain expert regularly review a representative sample of all output types.

It is intended that the clinicians receiving reports against patient results will consider the report in conjunction with all current and previous patient history and apply their own judgement when determining patient management. It is intended that the clinician does not rely on the existence of a report for the management of a patient.

The PKS software in itself does not provide automated diagnosis or treatment-making functions, or have the capability to control, in any way, the performance of a device or to treat or diagnose any disease.

It is the responsibility of the licensee to use the product in accordance with its intended use. In support of this, it is recommended domain experts include a statement consistent with the following on all reports.

“This report has been generated using clinical decision support software. This report is intended to provide adjunctive information only and should not replace clinical judgement.”

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Intended for

Client IT staff who have the responsibility of supporting RippleDown at their site.

Scope of Guide

This document explains the contents of the log files generated by the RippleDown server so that support engineers can:

1. Check RippleDown logs and look for errors.
2. Identify issues that can be solved internally and those that need to be referred to PKS.
3. Track the processing of particular cases through the system.
4. Use data mining tools to gather usage and performance statistics.

In addition, this document describes the events that will automatically generate an email to a nominated address of a support engineer for immediate attention.

RippleDown log files

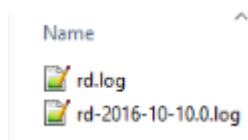
Overview

The RippleDown server logs are text files in a dedicated directory under the RippleDown installation directory.

<installation folder>/logs

Each log file is limited to 10MB in size, after which a new file is created. A new file is also created during daily housekeeping (usually at 2am local time).

The current (i.e. still being written to) log file is called "rd.log". Previous log files have a date and time in their filename that indicates the time at which they were "rolled over" from being the current log. For example, here is a logs directory with one current and one rolled log:



What is logged

The entries in the log files can be classified as follows:

- Case processing entries. These record when cases are received from the LIS, their interpretation, validation and the sending of an interpretation.
- User activity entries. Almost all user activity is reflected in log file entries that include the user involved and details of the user action, such as approving a case in the Validator or editing a comment.
- Internal server activities such as housekeeping.

Format of log entries

Most log entries consist of a single line as follows:

- A date and time (to millisecond precision),
- A code indicating the severity of the log entry, for example "INFO" for routine activity, "WARN" for a possible problem.
- Activity-specific information. Often this is given as a list of key=value pairs, separated by commas.

Significant log entries

Server lifecycle entries

The following log entries record significant events in the starting, stopping and automatic maintenance of the RippleDown server.

Entry	Meaning
2016-10-11 10:39:05:321 INFO ***** Starting server , Version: 7.5.0-b8 built on 3 October 2016, db: Infinity *****	The server has been started, but is not yet available for processing until all databases have been opened. This also identifies the version of RippleDown installed on this server.
2016-10-11 10:39:15:957 INFO exported	The server is now ready
2016-11-08 01:00:16:427 INFO House keeping started . Version: 7.4.5-b69 built on 21 september 2016	Housekeeping has been started, the server will be offline until it completes
2016-11-08 01:05:32:697 INFO Support email sent: 724	One of the first entries of a log file after a successful housekeeping
2016-10-11 13:19:27:842 INFO About to switchoff .	The server has been stopped by terminating the service/daemon or shutting down from the Administrator client.

Recommended minimum monitoring

PKS recommends the following log entries are monitored at a minimum:

Event	Entry	Meaning
House-keeping duration < 20	2016-11-08 01:00:16:427 INFO House keeping started . Version: 7.4.5-b69 built on 21 september 2016	Housekeeping has been started, the server will be offline until it completes

Event	Entry	Meaning
mins: the time between these two log file entries	2016-11-11 01:05:43:721 INFO House keeping finished	Housekeeping has been completed, the server will is back online
Upcoming license expiry < 30 days contact Customer Support for issue of new licence key	2016-11-11 01:00:19:859 INFO Licence status: Licence OK. Expiry Date: 12 jul 2017 Grace Period End Date: 12 aug 2017	This identifies the license expiry date
Cases being received and interpreted regularly	2016-11-07 12:11:49:522 INFO caseWorkflow=interpreted, caseName=054430, systemId=1282024, panel=NF, project=Delta nierfunctie, rules=90, validation=MANUAL, commentIds=[415]	Each customer should determine what is an acceptable gap between cases being interpreted, ie, if no cases are interpreted with <1 hour>, during working hours, an alert should be sent to administrator flagging a potential issue
Available system and backup space	2016-11-10 10:48:21:643 INFO Available space for data: 74 GB	Available server space for all RippleDown data
	2016-11-10 10:48:21:658 INFO Available space for backup: 924 GB	Available space for nightly backups.

Abnormal log entries

Errors or other abnormal log entries can be found by a case-sensitive text search of "**WARN**", and "**ERROR**".

If any of these are present, and you cannot resolve the issue on-site as indicated below, contact PKS Support immediately.

Issues that can be resolved on-site

Some abnormal log entries may be able to be handled on-site without assistance from PKS Support. These include:

Entry	Meaning	Action
<p>2016-11-11 09:58:58:381 ERROR Licence in grace period. Expiry Date: 08 Oct 2016 Grace Period End Date: 07 Dec 2016</p>	<p>The licence has entered a "grace period" and will expire soon</p>	<p>Contact PKS support before the grace period ends to obtain a new licence.</p>
<p>2016-11-11 09:46:24:122 ERROR Licence out of grace period. Expiry Date: 08 Oct 2016 Grace Period End Date: 09 Oct 2016</p>	<p>The licence has expired and the grace period has passed, so the server will shut down.</p>	<p>As above.</p>
<p>2015-08-06 10:07:15:809 WARN Could not create RippledownServer java.rmi.server.ExportException: Port already in use: 5814; nested exception is:</p>	<p>The server could not start because another server is already running on this platform</p>	<p>Stop any other instance of the RippleDown Windows service or Unix/Linux daemon before trying to start another one</p>
<p>2016-11-11 10:20:23:576 WARN Bad message saved in: D:\rippledown\db\backup\error\1611111020.txt</p>	<p>The LIS has sent a message which RippleDo</p>	<p>Retrieve the message from the error directory and resolve this issue with your LIS provider.</p>

Entry	Meaning	Action
	wn could not process	
<p>2016-08-10 09:49:03:860 WARN Could not archive file: 15-4401104.TES0.in java.io.FileNotFoundException: \\ltaultra\labwiz\ap\15-4401104.TES0.in (Access is denied)</p>	<p>The RippleDown server cannot write the specified file</p>	<p>Check that: The specified directory is mounted The RippleDown server process has write permission for the respective directory</p>
<p>2016-09-17 08:24:08:005 WARN No project for panel code: LP</p>	<p>The message has a panel code which does not correspond to any online project in RippleDown Server</p>	<p>From the RippleDown Administrator client, add the project with the corresponding panel code or add the panel code to an existing online project.</p>
<p>2016-11-11 10:42:03:306 WARN Could not send rd.log</p>	<p>The log file could not be emailed to PKS Support during housekeeping</p>	<p>Check that: Your email server is still functioning RippleDown has still the correct email settings in the AESender.properties file Your email server has not been setup to filter out or reject messages from the RippleDown server</p>
<p>2016-06-23 11:10:01:691 WARN Could not archive file: <filename></p>	<p>A copy of an input or output file was not able</p>	<p>Check to see if the directory is full, other processes are locking it, or if the account under which RippleDown is running does not have sufficient privileges to write files into the directory.</p>

Entry	Meaning	Action
	to be stored.	
<p>2016-07-06 02:03:34:726 WARN Could not send log.txt.1</p> <p>javax.mail.MessagingException: Could not convert socket to TLS;</p>	Email sending failure	<p>The following RippleDown flags can be configured in the text file `Service.vmoptions`, depending on your particular site requirements:</p> <p>Dmail.smtp.ssl.trust=xxx.xx.xx.xx</p> <p>where xxx.xx.xx.xx is the mail host name in <i><Rippledwn Installation directory>\rippledwn\properties\AESender.properties</i></p>
<p>2016-02-18 01:29:51:668 ERROR Could not rename</p> <p>C:\PKS\projects\backup_RippledwnServer.rdf to</p> <p>C:\PKS\projects\backup_RippledwnServer_bak_bak.rdf during backup</p>	Backup of named database was unsuccessful during overnight housekeeping	<p>Run housekeeping manually</p> <p>Review whether any process (e.g. virus scanner) may be locking this file at time of housekeeping.</p> <p>Monitor following night for ongoing issues.</p>
<p>2011-04-05 14:33:11:388 WARNING Could not send email to john.doe@hopital.org.au,jane.smith@hopital.org.au with subject GDNA Test Request Notification</p> <p>javax.mail.MessagingException: Failed to set recipients;</p>	The comment set to be emailed to multiple recipients has failed as a limitation of 1 email (or one email group) can be entered.	Correct the email recipient details and resend.

Tracking activity using the log files

Case processing

Log entries that document case processing have "caseWorkflow" as the first of their key-value pairs.

Step	Example	Explanation
receipt	2016-11-07 12:11:49:690 INFO caseWorkflow=receipt, caseName=054436, systemId=1282031	<p>The case has just been received from the LIS.</p> <p>A system id is assigned to the case. This can be used to track the progress of the case through RippleDown.</p>
interpreted	2016-11-07 12:11:49:522 INFO caseWorkflow=interpreted, caseName=054430, systemId=1282024, panel=NF, project=Delta nierfunctie, rules=90, validation=MANUAL, commentIds=[415]	<p>A case has been interpreted by the named project (Knowledge Base).</p> <p>Generally is immediately after a receipt entry.</p> <p>The validation status of the interpretation of the case is logged where "validation" means:</p> <p>FINAL => Auto-validated MANUAL => Not auto-validated</p> <p>commentIds is a comma separated list.</p>
enqueue	2016-11-07 12:11:51:427 INFO caseWorkflow=Enqueue, caseName=054669, systemId=1282108, queue=Default, project=Diabetes	A case has been queued for review in the RippleDown validator.
requestOk	2016-08-29 18:00:09:651 INFO caseWorkflow=RequestOK, caseName=CaseA4, systemId=47, queue=Default, project=AProject, user="admin",	A case has been checked in the RippleDown Auditor client and found to be error-free.

Step	Example	Explanation
sent	2016-11-07 12:11:50:534 INFO caseWorkflow=sent, caseName=054436^Labosys, systemId=1282031, project=Delta nierfunctie, interpretation="Normal lipid results."	The interpretation for the case has been sent back to the LIS.

A case can be tracked by searching for a receipt entry with its lab number in the log file. This might find a number of entries:

- Another case for the same lab number but for a different panel.
- A resend of the case, with the same panel.

Once the receipt entry matching the case name (lab number) and panel code, all other processing for that case can be found by searching for the system id in the receipt entry.

The turnaround time for a case within RippleDown, can be calculated as the difference between the caseWorkflow=receipt and caseWorkflow=sent entries for a particular systemId.

If there is no "sent" entry for a case, perhaps it is in a RippleDown validation queue.

Apart from the records of cases in log files, all incoming and outgoing messages are archived in a sub-directory of the projects backup directory. These files can be used to get precise information as to what was received from and sent to the LIS. These are archived into zip files with a date stamp as part of the house-keeping process.

User activity

User log in activity is captured as follows:

```
2016-11-10 08:00:42:458 INFO Logon attempt. User name: 'f.flintstone' . IP: [10.0.0.00]. App:
AC_VALIDATOR. Result: true. Client id: f.flintstone1234567
2016-11-10 08:00:42:459 INFO Login to web validator successful:f.flintstone
```

Where log-in fails, the Result will be "false".

The application the user has logged into is captured as per the second line above.

User log off is not captured.

Once logged on, log entries that document user actions have an "app" entry that indicates the application and a "user" entry that gives the login name of the user.

For example, this series of log entries shows the admin user opening a project using the Knowledge Builder and then browsing cases from the rejected and archive case lists:

```
2016-11-07 16:14:29:655 INFO app=KB, user=admin, command=ProjectGet, project=Lever
2016-11-07 16:14:31:926 INFO app=KB, user=admin, command=CaseInterpret, caseList=Rejected,
```

caseId=45680

2016-11-07 16:14:42:762 INFO app=KB, user=admin, command=CaseInterpret, caseList=Archive, caseId=280

Most of these entries are fairly self explanatory.

The Audit Trail tool in the Knowledge Builder, rather than the log files, formally records editing of RippleDown Knowledge Bases.

Automatically generated emails

The following are the events that will automatically generate an email to a nominated support staff. The address of the email is specified by the TO_PAGING value in the server configuration file AESender.properties. Multiple email addresses can be specified as a comma separated list:

TO_PAGING=manager@pathology.com, administrator@pathology.com

Each event is also logged in the server log file, as described below:

Log event	Email message	Description	Support action
Internal error	Static initialiser of Keywords failed	Internal software error	Contact PKS support
Case processing failed for {case name} for project {project name}	(same as log event)	Case could not be processed or an interpretation could not be created due to exceptional circumstances.	Contact PKS support
Could not record usage for case	Usage	Internal software error	Contact PKS support
Could not commit day list db.	Could not commit day list db for {}	Archive database was not properly committed to the DB file.	Contact PKS support

Log event	Email message	Description	Support action
Could not get core: {}	(same as log event)	The requested project could not be opened.	Contact PKS support
RippleDown Web Server error	Unable to start Web Server for WAR apps, please adjust Server Settings and restart	RippleDown companion web server could not be started and therefore some functionality might not be available (REST interface, ...)	Try changing the web server port or contact PKS support.
Licence in grace period.	Licence expiry detected in housekeeping: Licence in grace period.	License expired and a grace period started	Contact PKS support.
Licence out of grace period.	(same as log event)	License expired and a grace period finished.	Contact PKS support.
BACKUP FAILED	(same as log event)	The backup process of the databases failed.	Contact PKS support.
Corrupt database detected: {}	Database saved to backup directory {}	A corrupted database has been detected and removed from the list of projects. It can be found on the path specified in the email.	Contact PKS support.

Log event	Email message	Description	Support action
{} not identical	{} was not identical to original after compaction	Database compaction finished with errors.	Contact PKS support.
Could not insert into string store. Record length: {}	StringStore	An attempt to store a record longer than maximum permitted length in the database.	Contact PKS support.