ELN at the Fritz-Haber-Institute

Heinz Junkes

MPDL, ELN Workshop, Berlin, March 2016, 14th
The derivation of ELOG

ELOG: Developed by Stefan Ritt, PSI, Switzerland. Most of the fundamental work was done by him. Only some few extensions have been implemented by us.

Most of the pictures used here are out of the talk “The electronic logbook ELOG and its utilisation for accelerator operations” held at KIT Seminar, Jan. 30th 2015 by Stefan Ritt.
Heinz Junkes

History of E-logbooks at the FHI

SUN was taken over by Oracle. We had to switch the operating system (Solaris->Linux). Due to migration problems we switched to another logbook -> ELOG

e-logbook from DESY by Raimund Kammering, running on Sun/Solaris. Very little use at the FHI (not used?).

Commissioning of the new FEL. Need for electronic labbook increases. Heavy use by the FEL staff.

Classic client server architecture
Basic principles of ELOG

- Web access
  - Reachable from any computer with Web Browser
  - Monolithic C(++) program
  - Faster than interpreted languages
  - Needs less memory, runs nicely on RaspberryPi
  - Does not depend on Web servers
  - No dependency of external libraries (except SSL)
  - Simple to compile and install
  - Recent extensions in JavaScript
Basic principles of ELOG

“Designed by user”
- Only contains features that are needed
- (Most) needed features are contained

Configurable
- Can be electronic logbook, discussion forum, bug tracker, …
- Huge number of configuration options
  - FHI add on: printer extension (CUPS printer)
  - FHI add on: private logbook export
  - FHI add on: special thumbnail/image storage
ELOG Database

- Simple text database
- Database can not get corrupt
- Database can be edited with ASCII editor (by “experts”)
- Scripting tools can be used to analyse or modify ELOG databases
- Attachments as files
- Data storage with one file per day: YYMMDDa.log
- Can make easy backups: $ 14????a.log /backup
- Recent change with one subdirectory per year: 2013/13*a.log

Additional Information:
- $@MID@$: 1
- Date: Wed, 13 Feb 2013 11:34:24 +0100
- Author: Heinz
- Type: Other
- Category: USERLOG
- Subject: Gesundes Neues Jahr!
- Severity: NONE
- Keywords: Computer-Control
- Record date: 1357214635
- Attachment:
- Encoding: ELCode
Configuration Concept

Configuration via single text file, editable through web browser

```
[global]
port = 4813
URL = https://elogbook.fhi-berlin.mpg.de/elog/cp/
SMTP host = mail.fhi-berlin.mpg.de
Usr = elog
Grp = elog
Theme = fhi
Welcome Title = <img src="Minerva.gif" width="100" height="100"> <p><font size=5 color=white>FHI - ELOG - CP Logbook Selection</font><BR /><span><font size=2> ELOG Service at the FHI configured and operated by PP&amp;B</font></span><BR>
PP&amp;B<BR>
developed by S.Ritt, Paul-Scherrer-Institut</font></span><BR>/<span>
Page title = FHI - ELOG - CP Logbook Selection
Admin user = junkes
Allow delete = junkes
Restrict edit time = 12
Restrict edit = 1
Thumbnail size = 400
```
Configuration Concept

Many log-books can be run in parallel with different configurations

root@threeofnine:~ $ ps -ef | grep elogd
elog  1159  1  0  2013  00:45:26 /usr/local/sbin/GvH_elogd -f /usr/local/FHI_ELOG/MP/elogd-threeofnine.pid -c /usr/local/FHI_ELOG/MP/elogd.cfg -D
elog  1163  1  0  2013  00:44:30 /usr/local/sbin/elogd -f /usr/local/FHI_ELOG/TH/elogd-threeofnine.pid -c /usr/local/FHI_ELOG/TH/elogd.cfg -D
elog  1737  1  0  2013  01:00:16 /usr/local/sbin/elogd -f /usr/local/FHI_ELOG/FEL/elogd-threeofnine.pid -c /usr/local/FHI_ELOG/FEL/elogd.cfg -D
elog  2492  1  0  2015  00:12:28 /usr/local/sbin/elogd -f /usr/local/FHI_ELOG/CP/elogd-threeofnine.pid -c /usr/local/FHI_ELOG/CP/elogd.cfg -D
elog 10153  1  0  Jan27  00:01:59 /usr/local/sbin/elod -f /usr/local/FHI_ELOG/PC/elogd-threeofnine.pid -c /usr/local/FHI_ELOG/PC/elogd.cfg -D
elog  24935  1  0  2014  00:46:56 /usr/local/sbin/elod -f /usr/local/elod/elogd-threeofnine.pid -c /usr/local/elod/elog/elod.cfg -D

Total of 149 settings and 41 flags, documented on one huge page:
http://midas.psi.ch/elog/config.html
Attributes

- Attributes are values common to all entries in a logbook, like "columns" in a relational database
- Defined via **Attributes = Author, Type, Category**
- Stored in header of text files
- Attribute sets are extendable

---

<table>
<thead>
<tr>
<th>Record date</th>
<th>Author</th>
<th>Severity</th>
<th>Subject</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tue Feb 19 15:52:03 2013</td>
<td>Heinz Junkes</td>
<td>INFO</td>
<td>Changed ids user mart</td>
<td>Id of smart user set to 500/100 to get synchronized with the new Qnap system.</td>
</tr>
<tr>
<td>Thu Jan 3 13:03:55 2013</td>
<td>Heinz</td>
<td>NONE</td>
<td>Gesundes Neues Jahr!</td>
<td></td>
</tr>
</tbody>
</table>
| Thu Dec 6 15:33:05 2012 | Heinz | NONE | Install CSS on uff6 for user smart | Installed CSS Version 3.1.2 "Basic EPICS" from SNS for Red Hat #86,44
add user epics Install basedir3.12.12 to /home/epics/base make-app -i -t example das in /home/epics/das make, cp das.db and install updates on uff6, during reboot a file-system check was forced due to the fact that since 183 no file system check was performed |
| Thu Dec 6 14:54:20 2012 | Heinz | NONE | EPICS at uff6 | |
| Thu Dec 6 12:33:17 2012 | Heinz | INFO | Heinz bei Bessy ;-) | |
| Fri Sep 14 08:42:45 2012 | HWK | NONE | Morning Readout | |
| Thu Sep 13 09:13:36 2012 | HWK | NONE | Morning Readout | |
| Wed Sep 12 12:04:45 2012 | HWK | NONE | Standard layout for Ru(0001) cleaning entry | Attached is the standard layout for theelogbook entry of the cleaning procedure of Ru(0001). |

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$@MID@$: 1
Date: Wed, 13 Feb 2013 11:34:24 +0100
Author: Heinz
Type: Other
Category: USERLOG
Subject: Gesundes Neues Jahr!
Severity: NONE
Keywords: Computer-Control
Record date: 1357214635
Attachment:
Encoding: ELCode
Conditional attributes

Settings can depend on the value of an attribute

Attributes = PC Name, Operating System, Version
Options Operating System = Linux[1], Windows[2]
{1} Options Version = 2.2, 2.4, 2.6
{2} Options Version = NT, XP, W7, W8

Hide certain attributes on conditions, different tooltips, logical or of conditions, ...

“Merge” different logbooks into one
Flags

- Enable/Disable almost all features
- Default presets for most dialog boxes
- Select language (17 languages available)

Flags

- **Show text = 0|1**
  This flag controls if logbook entries contain a body text. If an installation only requires attributes, this flag can be set to 0. Default is 1.
- **Enable attachments = 0|1**
  This flag controls the attachment submission at the bottom of a message entry page. If this flag is 0, the attachment section is not displayed. This might be useful for logbooks where attachments are not used. Default is 1.
- **Show attachments = 0|1**
  This flag controls the display of attachments such as images on normal logbook pages. For logbooks with large images, this flag can be turned off, so that attachments are only displayed when they are clicked on. Default is 1.
- **Preview attachments = 0|1**
  This flag controls the display of attachments in the edit form. If one uploads an attachment, but has not yet submitted the entry, the uploaded attachments are shown at the bottom if this flag is 1. Only ASCII files and images are shown of course. Default is 1.
- **Summary lines = x**
  This specifies the number of text lines displayed in a summary page. Zero displays no text at all. The default is 3.
- **Summary line length = x**
  This specifies the number of characters of the summary lines. After this number of characters, a line break is inserted in long lines to keep the column width not too wide. The default is 40.
- **Attachment lines = x**
  This specifies the number of text lines displayed for ASCII attachments. For long ASCII attachments, it can be useful to only display the first few lines not to make the HTML page too long. The default is 300.
- **Reverse sort = 0|1**
  If this flag is 1, all listing pages (the default page view, the result of a search query and the result of the “Last day” query) is sorted in reverse order (newest entry down to oldest). The checkbox *Sort in reverse order* on the search form gets checked by default, too. Sorting in reverse order can make sense if there are many pages of entries, but the ones entered last should be displayed on the first page. Default is 0.
- **Search all logbooks = 0|1|2**
  If this flag is 1 or 2, the search form displays the button “Search all logbooks”. If the flag is 2, the button is checked by default. Setting this flag to 0 hides this button. It might be necessary to do this for public logbooks if there are also protected logbooks. Otherwise the

[http://midas.psi.ch/elog/config.html#flags](http://midas.psi.ch/elog/config.html#flags)
Email notification for certain processes

- New entry, modified entry
- Email to registered user(s) or external email addresses
- Attributes have certain values
  (like **new entry** with **system=DAQ & category=Error**)
- Email can contain summary, full entry, with/without attachments
Access control

- User accounts with central password database (XML) and optional guest access
- Auto-logout, self register [with admin approval]
- Kerberos & LDAP support

```xml
<?xml version="1.0" encoding="ISO-8859-1"?>
<!-- created by MXML on Thu Mar 10 18:40:44 2016 -->
<list>
  <user>
    <name>junkes</name>
    <password encoding="SHA256">NH5/.NVvKt3yVtApnoqCPff97PhxrcXUp8yNp.CbdwA</password>
    <full_name>Heinz Junkes</full_name>
    <last_logout>Wed Mar  9 18:15:07 2016</last_logout>
    <last_activity>Thu Mar 10 08:53:45 2016</last_activity>
    <email>junkes@fhi-berlin.mpg.de</email>
    <inactive>0</inactive>
    <email_notify/>
  </user>
</list>
```
Themes

CSS = <file.css>

/* default formatting */
body {
  margin:3px;
  color:black;
  background-color:white;
  font-family:verdana,tahoma,sans-serif;
/* background-image:url(elog.gif); */
}

/* standard link colors and decorations */
a:link { color:#0000FF; text-decoration:none }
a:visited { color:#800080; text-decoration:none }
a:hover { color:#0000FF; text-decoration:underline }
a:active { color:#0000FF; text-decoration:underline }
a:focus { color:#0000FF; text-decoration:underline }
Mirroring

- Keep two or more logbooks in sync
- Synchronisation works both ways
- Implementation using MD5 hash values

<table>
<thead>
<tr>
<th>Logbook 1</th>
<th>Logbook 2</th>
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<tbody>
<tr>
<td>ID 3</td>
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<tr>
<td>ID 1</td>
<td>ID 1</td>
</tr>
</tbody>
</table>

Mirror server = <URL-list>
Mirror config = 0 | 1
Mirror cron = 0 3 * * * // every night at 3:00
“elog” utility

- Command line utility to commit ELOG entries
- Scriptable **“cat text | elog -h ... -l ...”**
- Automatic entries e.g. accelerator status

```
elog -h
elog 2.9.1 built Feb 5 2013, 10:49:02 revision 436

usage: elog
elog -h <hostname> [-p port] [-d subdir]
   [-l logbook/experiment]
   -s
   [-v]
   [-u username password]
   [-f <attachment>]
   -a <attribute>=<value>
   [-r <id>]
   [-q]
   [-e <id>]
   [-x]
   [-n 0|1|2]
   -m <textfile>] | <text>
```

Location where elogd is running
Name of logbook or experiment
Use SSL for communication
For verbose output
Wser name and password
(up to 50 attachments)
(up to 50 attributes)
Reply to existing message
Quote original text on reply
Edit existing message
Suppress email notification
Encoding: 0:ELcode, 1:plain, 2:HTML
Recent extension (Dario Milicic) allows Rich Editing, Drag & Drop of images and smartphone photo upload.
“FHI” - extension

- To each logbook a printer is connected to (via CUPS)
- From any application a print to logbook is supported
"FHI" - modification

Printable output (as booklet)
- Completely custom HTML hand crafted forms as input forms for logbooks
- Perfect for shift checks with tablet computers

https://midas.psi.ch/elogs/Forum/66909
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<td>Sun Aug 25 14:27:29</td>
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<td>Sat Aug 24 22:52:12</td>
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Most browsers allow definition of custom search engines

Define ELOG as a search engine with custom search string

http://midas.psi.ch/elogs/Forum/?subtext=%s
Installation

- Public GIT repository
  - "make"
  - "sudo make install"
  - "sudo /etc/init.d/elogd start"
  - "launchctl" under OSX
- Source code TAR ball
- Windows Binaries
- Linux Binaries (RPMs)
- Debian Package
• Use since 2001 for three large experiments with ~30 logbooks
• Reliable, easy to use
• “monit” tool to restart crashed server (couple of times per year on public server)
• In spite of vast usage (~10 labs, all LHC experiments) I get only ~few issues per month
• Logbook size fine to ~few 100’000 entries, search can get slow
In case of questions …