



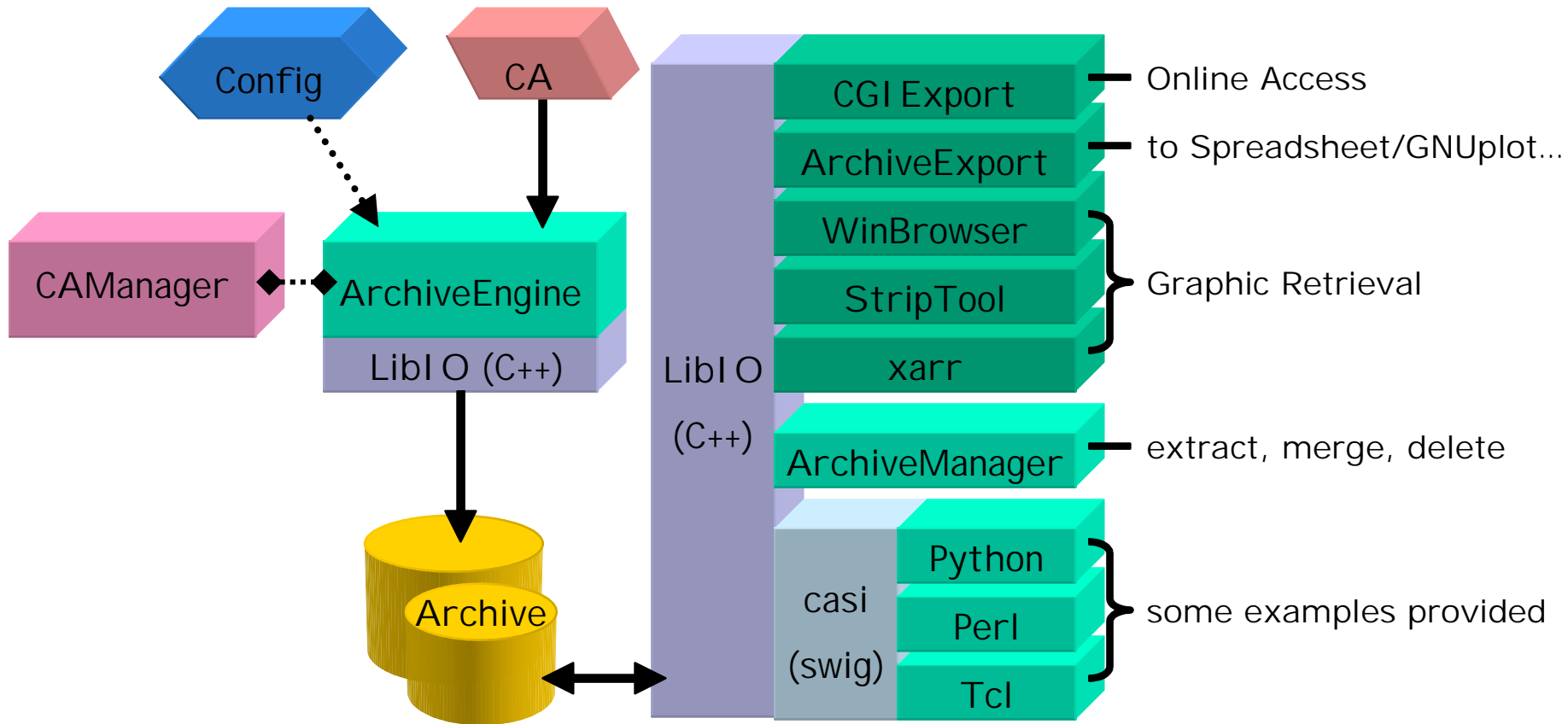
Channel Archiver – Update

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LANL

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Overall Structure





Recent Changes

■ ArchiveEngine

- Stores a sample after re-connect
- Option to switch off online configuration interface

■ ArchiveManager

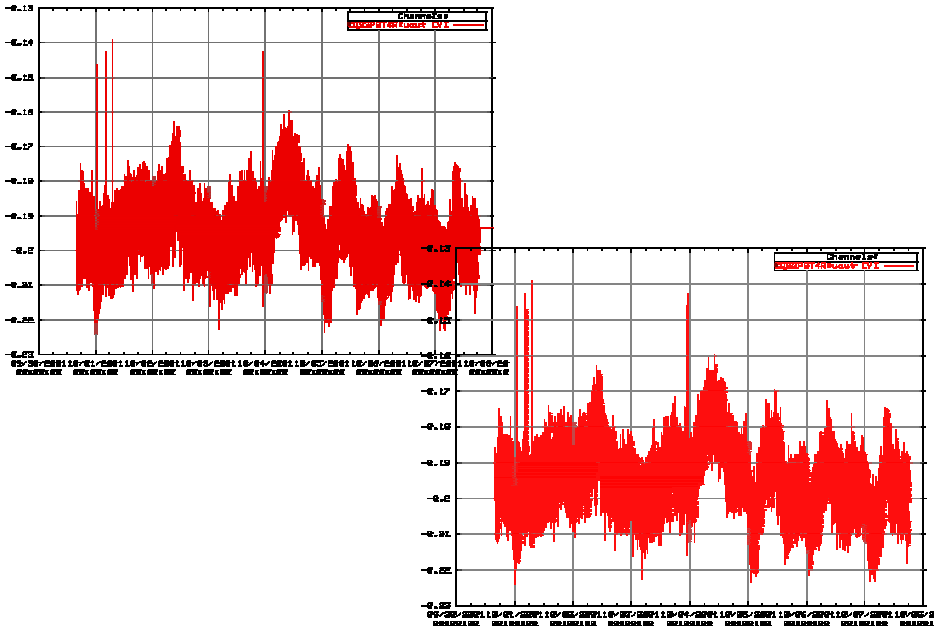
- Delete or rename a channel in the archive

■ ArchiveExport

- Use new features of LibIO
- Optionally ignore repeat-counts on export

Changes – LibIO

- New *BucketingValueIterator* reduces data on retrieval in a way that at most four values (*first*, *min*, *max* and *last*) per bucket (a timeslice) are returned



Example	w/o	w/
ArchiveExport	~30s	~5s
resulting file-size	~20MB	~80kB
GNUplot	~11s	~0.5s
CGIExport	~45s	~6s



Changes – LibIO (contd.)

■ Improved performance of MultiArchive

If start- and end-time are provided, only those archives in the MultiArchive are used, that intersect this time interval

■ Two possibilities

- Use the same MultiArchive-file as before:

LibIO retrieves min-/max-times of all archives and uses only those, that match the time interval

- Provide timestamps in the MultiArchive-file:

LibIO doesn't even touch archives that don't match the given time interval

- ✦ Example: *70 weekly archives – each ~1GB/~3000 channels, searching with a pattern (regexp) matching a few channels and a timerange that matches 2 archives:*

original: ~100s – V1: ~6s – V2: ~2s

Changes – CGIExport

Channel List

Pattern: LIST INFO

file glob

Names:

CLEAR

Start: Day (m/d/y) 09 30 2001 Time (h:m:s) 00 00 00

End: Day (m/d/y) 10 07 2001 Time (h:m:s) 23 59 59

GET

Plot All Data: (plot data is reduced otherwise)

Spreadsheet Status: (show channel status)

Excel-File Fill: (step-func, interpolation)

Matlab Interpolate: secs (linear)

Command Explanation:

- * List: List all channels that match pattern
- * Info: Show info on channels that match pattern or are in name list
- * Get: Get values for given channels that are within time range
 - o Plot: Get simple online plot.
 - o Spreadsheet: Get a spreadsheet type text file which you can save to your disk for further investigation.
 - o Excel: Same, but with HTTP hints that ask the web browser to directly open the file in Excel, skipping the save-to-disk. Might not work for your PC.
 - o Matlab: Get a Matlab command file.
 - o Status: Export the channel status (disconnected, ...). Not supported for all formats.

Hints concerning...

- * [Regular Expressions for the pattern field](#)
- * [Filling, Interpolation](#)
- * [Spreadsheet programs](#)

- **LIST** lists channels in text entry
- **CLEAR**-button to clear text entry
- *BucketingValueIterator* is default
- GNUPlotExporter inserts data at start- and end-time and on all events (ArchiveOff, Disconnect...)
- Plotting *steps* is now the only way (no more *linespoints*)
- Benefits from enhancements in MultiArchive handling



Changes - casi

- Access ControllInfo of a value
- Create values from scratch
- Perl/Python/Tcl scripts can now not only retrieve/sparse data but also create data
- Scripts may also be used for data-aging or e.g. to repair, patch or create data (statistics...)
- More example-scripts to come...



casi – python-Example

```
1: # USAGE: xample.py <source archive> <target archive> <pattern> <delta>
2: # copy channels in archive, but reduce values using simple deadband-algorithm
3:
4: import sys
5: from casi import *
6:
7: cmd, source, target, pattern, delta = sys.argv    # get cmdline-args
8:
9: s_arc = archive(); t_arc = archive()
10: s_chan = channel(); t_chan = channel()
11: s_val = value(); t_val = value()
12:
13: s_arc.open(source)                               # read-only access
14: t_arc.write(target, 24)                          # write access, 24 hours per file
15:
16: s_arc.findChannelByPattern(pattern, s_chan)
17: while s_chan.valid():
18:     t_arc.addChannel(s_chan.name(), t_chan)       # create channel in target
19:     t_arc.newValue(DBR_TIME_FLOAT, 1, t_val)     # create value in target
20:     s_chan.getFirstValue(s_val)
21:     firstval = 1
22:     while s_val.valid():
23:         t_val.clone(s_val)                        # copy all info about s_val
24:         if (s_val.isInfo()):                      # info (ARCHIVE_OFF, DISCONNECT...)
25:             t_chan.addValue(t_val)               # copied
26:             firstval = 1
27:         elif ((s_val.ntype() == DBR_TIME_FLOAT) and (s_val.count() == 1)): # process only floats
28:             if (firstval or (abs(lastval - s_val.get()) >= float(delta))):
29:                 t_chan.addValue(t_val)
30:                 lastval = t_val.get()
31:             firstval = 0
32:         s_val.next()
33:     s_chan.next()
```




casi – python Example

Initialization and retrieval of cmdline-arguments

```
4: import sys
5: from casi import *
6:
7: cmd, source, target, pattern, delta = sys.argv
```

Create the necessary objects

```
9: s_arc = archive(); t_arc = archive()
10: s_chan = channel(); t_chan = channel()
11: s_val = value(); t_val = value()
```

Open the archives

```
13: s_arc.open(source)           # read-only access
14: t_arc.write(target, 24)      # write access, 24 hours per file
```



casi – python Example

Iterate over all channel whose names match **pattern**

```
16: s_arc.findChannelByPattern(pattern, s_chan)
17: while s_chan.valid():
```

Create a new channel and value in the target archive

```
18:     t_arc.addChannel(s_chan.name(), t_chan)    # create channel in target
19:     t_arc.newValue(DBR_TIME_FLOAT, 1, t_val)  # create value in target
```

Iterate over all values of the source-channel

```
20:     s_chan.getFirstValue(s_val)
21:     firstval = 1
22:     while s_val.valid():
```



casi – python Example

“Clone” all information of the source-value

```
23:         t_val.clone(s_val)           # copy all info about s_val
```

The same could be achieved by doing

```
t_val.set(s_val.get())
t_val.setTime(s_val.time())
t_val.setStat(s_val.stat(), s_val.sevr())
ctrlinf = ctrlinfo()
s_val.getCtrlInfo(ctrlinf)
t_val.setCtrlInfo(ctrlinf)
```

Copy any info-value as-is

```
24:         if (s_val.isInfo()):           # info (ARCHIVE_OFF, DISCONNECT...)
25:             t_chan.addValue(t_val)     # copied
```



casi – python Example

In this example only scalar float values are copied

```
27:         elif ((s_val.ntyep() == DBR_TIME_FLOAT) and (s_val.count() == 1)):
28:             if (firstval or (abs(lastval - s_val.get()) >= float(delta))):
29:                 t_chan.addValue(t_val)
30:                 lastval = t_val.get()
```

Close both iterator-loops

```
32:         s_val.next()
33:         s_chan.next()
```

BUT: Script lacks several checks

- Equality of source and target archive
- Channel already exists in target archive
- I guess, I forgot more...

New – CAManager

- Two processes
CAManager with GUI, *CABgManager* without
- Manage archives and archivers (no retrieval!)
- Configure ArchiveEngines
host, port, files, directories, schedule...
- Starts/Stops/Restarts ArchiveEngines
- Current status via http-interface
- Runs on Windows and Unix
- Access to ArchiveManager and ArchiveExport
test/info, export data to spreadsheet, GNUplot, Matlab or
another archive, rename/delete channels from archive

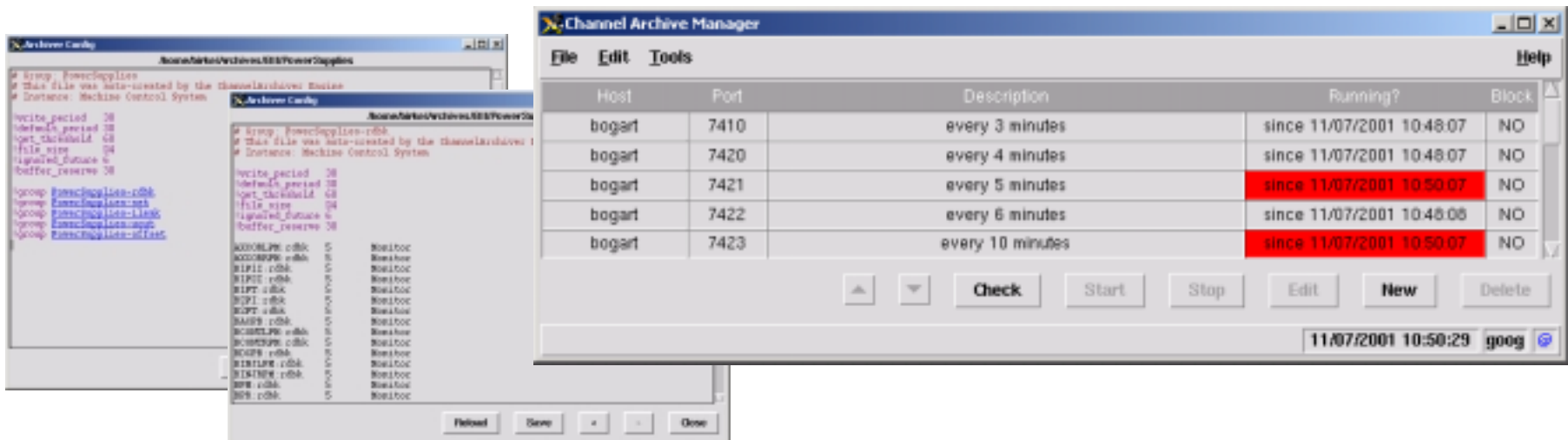


The screenshot shows the Channel Archive Manager GUI with a table of archive configurations. The table has columns for Name, ID, Schedule, Last Run, and Status. The data is as follows:

Name	ID	Schedule	Last Run	Status
bogart	7420	every 4 minutes	since 11/06/2001 17:06:06	NO
bogart	7421	every 5 minutes	since 11/06/2001 17:06:06	NO
bogart	7422	every 6 minutes	since 11/06/2001 17:06:06	NO
bogart	7423	every 10 minutes	since 11/06/2001 17:00:06	NO
		every hour	since 11/06/2001 17:00:06	NO
		every 3 hours	since 11/06/2001 17:00:07	NO
		every 6 hours	since 11/06/2001 14:26:07	NO
		every day	since 11/06/2001 02:00:07	NO
		every 3 days	since 11/05/2001 13:36:55	NO
		every 7 days	since 11/05/2001 13:36:55	NO
		every week	since 11/05/2001 13:36:55	NO
		no schedule	NO	NO
			NO	NO

New – CAManager (contd.)

- Overview of configured archivers
- Start/stop archivers manually
- Block archivers from being started/stopped
- Access ArchiveManager and ArchiveExport
- Simple configuration file editor

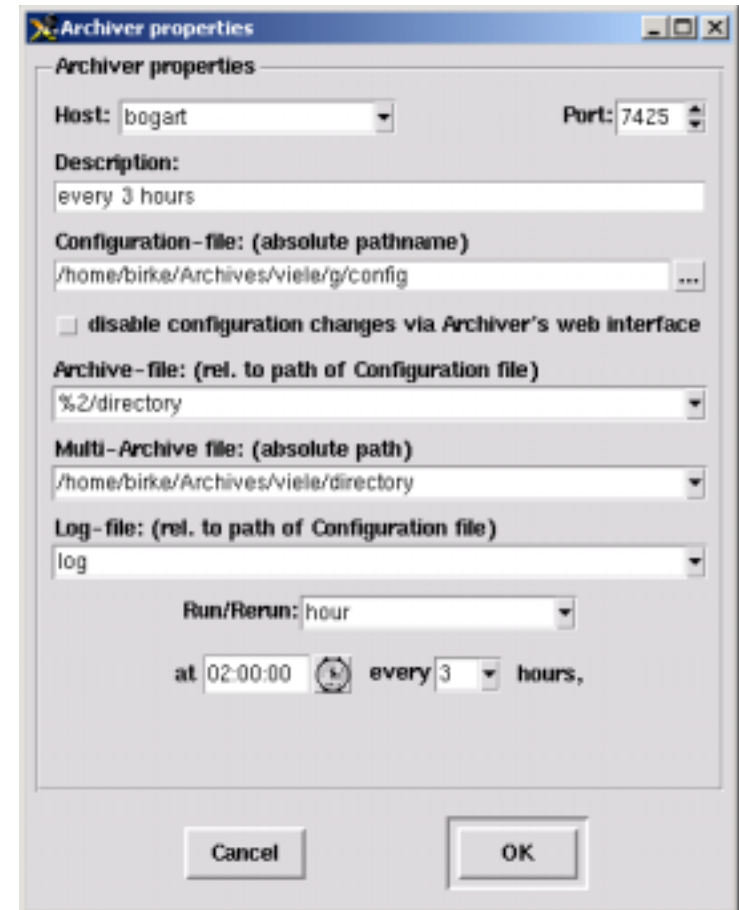


The screenshot displays the Channel Archive Manager interface. On the left, there are two overlapping windows showing configuration files for various archivers, including 'PowerSupply' and 'PowerSupply-rdb'. The main window, titled 'Channel Archive Manager', features a menu bar (File, Edit, Tools, Help) and a table of archivers. The table has columns for Host, Port, Description, Running?, and Block. Below the table are buttons for 'Check', 'Start', 'Stop', 'Edit', 'New', and 'Delete'. The status bar at the bottom shows the date and time '11/07/2001 10:50:29' and the user 'goog'.

Host	Port	Description	Running?	Block
bogart	7410	every 3 minutes	since 11/07/2001 10:48:07	NO
bogart	7420	every 4 minutes	since 11/07/2001 10:48:07	NO
bogart	7421	every 5 minutes	since 11/07/2001 10:50:07	NO
bogart	7422	every 6 minutes	since 11/07/2001 10:48:08	NO
bogart	7423	every 10 minutes	since 11/07/2001 10:50:07	NO

New – CAManager (contd.)

- Host, port, description, config-file, online-cfg
- Archive- and log-file %-substitution
- MultiArchive
- Schedule
 - hour, day, week, month start at x , every y
 - from – to, always or no schedule at all



The screenshot shows a dialog box titled "Archiver properties". It contains the following fields and options:

- Host:** bogart
- Port:** 7425
- Description:** every 3 hours
- Configuration-file: (absolute pathname):** /home/birke/Archives/viele/g/config
- disable configuration changes via Archiver's web interface
- Archive-file: (rel. to path of Configuration file):** %2/directory
- Multi-Archive file: (absolute path):** /home/birke/Archives/viele/directory
- Log-file: (rel. to path of Configuration file):** log
- Run/Rerun:** hour
- Schedule:** at 02:00:00 every 3 hours

Buttons: Cancel, OK

New – CAbgManager

- Background process (no GUI)
- Status via web-interface
- Starts/stops/restarts archivers according to required schedule
- Prepares directories
- Checks online config-changes into CVS and uses new config for next start
- Updates MultiArchives



Channel Archiver - bgManager

Configured ArchiveEngines for config goog of user dlrke on host bogart

ArchiveEngine	Port	running?	nexttime	command
every 3 minutes	7410	since 11/07/2001 10:42:07	@ 0. min. + every 3 minutes	<input type="button" value="STOP"/>
every 4 minutes	7420	since 11/07/2001 10:44:07	@ 0. min. + every 4 minutes	<input type="button" value="STOP"/>
every 5 minutes	7421	since 11/07/2001 10:43:05	@ 0. min. + every 5 minutes	<input type="button" value="STOP"/>
every 6 minutes	7422	since 11/07/2001 10:42:07	@ 0. min. + every 6 minutes	<input type="button" value="STOP"/>
every 10 minutes	7423	since 11/07/2001 10:43:05	@ 0. min. + every 10 minutes	<input type="button" value="STOP"/>
every hour	7412	since 11/07/2001 10:00:02	@ *00:00	<input type="button" value="STOP"/>
every 3 hours	7418	since 11/07/2001 08:00:05	@ 02:00:00 + every 3 hours	<input type="button" value="STOP"/>
every 8 hours	7413	since 11/07/2001 05:35:10	@ 05:35:00 + every 8 hours	<input type="button" value="STOP"/>
every day	7414	since 11/07/2001 02:00:12	daily @ 02:00:00	<input type="button" value="STOP"/>
every 2 days	7417	since 11/07/2001 02:00:12	every 2 days @ 02:00:00	<input type="button" value="STOP"/>
every 5 days	7415	since 11/05/2001 13:38:55	every 5 days @ 00:00:00	<input type="button" value="STOP"/>
every week	7416	since 11/07/2001 02:00:12	Wednesdays @ 02:00:00	<input type="button" value="STOP"/>
strange	7419	NO	10/31/2001 12:30:00 - 14:30:00	<input type="button" value="START"/>
no schedule	7411	NO	NO	<input type="button" value="START"/>

Messages (most recent first)

Errors/Warnings / Starts/Stops / Scheduled jobs / Misc.

```
2001/11/07 10:44:06: stopping "every 4 minutes" @ 2001/11/07 10:43:00
2001/11/07 10:44:06: stat "every 4 minutes"
2001/11/07 10:44:00: stop "every 4 minutes"
2001/11/07 10:42:06: stopping "every 6 minutes" @ 2001/11/07 10:43:00
2001/11/07 10:42:06: stat "every 6 minutes"
2001/11/07 10:42:06: stopping "every 3 minutes" @ 2001/11/07 10:45:00
2001/11/07 10:42:06: stat "every 3 minutes"
```


Plans

- HPUX (threads, C++ library)
 - Wait for EPICS 3.14 to solve this?
- Never enough methods of plotting
 - Improve MATLAB support, but no more plotting code
 - Add perl/python example for CGI plotting
- Network-access, not via NFS but to server with data reduction (averaging, FFTs, ...)
 - JLab, Chris?

Plans (contd.)

- Meta-frontend for browsing/retrieval
 - Glue all retrieval- and exporting-tools together
 - Browse MetaArchives and archives found in CAManager configuration
 - Generic channel name browser e.g. based on naming convention
- Contributions are welcome
 - PythonBrowser (Bob Hall, SLAC)
 - New exporters/iterators (SDDS?)
 - Scripts that perform any processing on archives
- Suggestions?

