

# TINE Release 5.x.x News

(Jan 31, 2023: inching toward perfection ...)

It's been a while, but ...

**“Remember:** *Only the dead fish go with the flow ...”*



# [ Release 5.2.6 ]

- Fixes, Features, and Issues ...
  - *exotica* : diagnostic improvements
  - contract coercion: forcing TCP/IP
  - *new features* in C and java
    - some doocs/jddd issues
  - Bug-of-the-Year !
  - *new command line tools*

# [ Release 5.2.6 ]

## ■ Diagnostic improvements

### ○ Save-and-Restore

- *note:* any property can (*try to*) register itself as a 'save-and-restore' property ...
- *now:* all problems in error.log and fec.log. e.g. :

```
09.01.23 14:12:42.515 CET[PLSFEC][ERROR] PulseScanInterval is not an allowed
save-and-restored property : no registered input
```

- *and:* any adjustments in fec.log. e.g.:

```
19.01.23 15:26:25.891 CET[SINFEC][INFO] SINEQM: Save-and-Restore for property
Phase will honor 10 channel(s) rather than all 15 devices due to registration
19.01.23 15:26:25.970 CET[SINFEC][INFO] SINEQM: Save-and-Restore for property
SingleValue will honor 1 channel(s) rather than all 15 devices due to registration
```

# Release 5.2.6

- Diagnostic improvements
  - better logging diagnostics upon socket error.
  - manifests in cache directory.
    - i.e. <EQM>/cache
    - e.g. devices, properties, histories, alarms ...

```
fecadmin@mcslxterm02:/export/tine/servers$ ls bpm/bin/BPMEQM/cache/  
almwatchmf.csv devmf.csv hstmf.csv prpmf.csv  
fecadmin@mcslxterm02:/export/tine/servers$ ls sine/bin/SINEQM/cache/  
almmf.csv devmf.csv Phase-members.csv SineTable.NAM-members.csv  
almwatchmf.csv Frequency-members.csv prpmf.csv SingleValue-members.csv  
Amplitude-members.csv hstmf.csv SineInfo-members.csv SingleValuePerDevice-members.csv  
Damping-members.csv Noise-members.csv Sine-members.csv Value-members.csv  
fecadmin@mcslxterm02:/export/tine/servers$ ls pulse/bin/PLSEQM/cache/  
devmf.csv hstmf.csv prpmf.csv
```

useful for those servers which register things via API ...



# [ Release 5.2.6 ]

## a short review ...

- Contract Coercion
  - *client* asks for *property* & *device* with some data *format* and *length* with some transport *mode* ... and ... the *server* gives the client what he wants but does it the way it wants to do it !
  - specific *return codes* initiate *extra handshaking* (all happens under the hood).
  - benefits (e.g.):
    - **MCA coercion**: server has 1 single action scheduled rather than many (i.e. fewer interrupts)
      - e.g. send ALL BPM positions (1 contract) rather than send 270 BPM positions (270 contracts)
    - **redirection**: requested property/device are handled on another server
    - **force multi-cast**: server will send requested data with 1 multicast.
      - e.g. video frame/pulse spectrum sent a single time as multicast rather than 10 times to 10 different subscribers.
    - etc.

# [ Release 5.2.6 ]

NEW ->

- New Contract Coercion possibility:
  - force TCP/IP transport
  - pass the **CA\_CONNECT** bit in property registration API or “**CONNECT**” in config file (exports.csv or fec.xml) and ...
    - enforce all data transport (using the associated property) to make use of TCP rather than UDP.
- *Why would you want to do this?*
  - flow control is important ...
    - Server on a faster network than client
  - lossy network ...
  - but TCP uses (a lot!) more resources than UDP ... but then again ... today's PCs don't really notice ...
  - e.g. latest TINE video servers

# Release 5.2.6

a short review ...

## ■ Influencing default behavior ...

### ○ API

- e.g. SetPacketMTU(0x10000);
- **BUT**: need to code and rebuild executable ...

### ○ *environment variables*

- e.g. set FEC\_PACKETMTU=0x10000
- Executable does not need to be touched! 😊

### ○ *config files ...*

fecid.csv (or fec.xml)

- Executable does not need to be touched BUT does need to make use of config files!

A	B	C	D	E	F	G	H	I	J
FEC_NAME	Export_Name	Port_Offset	MTU	Context	SubSystem	Description	Location	Hardware	Responsible
SINEFEC	SineServer	1	0x10000	TEST	TEST	Sine Curve Generator	Bldg 30 Room 502	None	P.Duval

### ○ Precedence ?

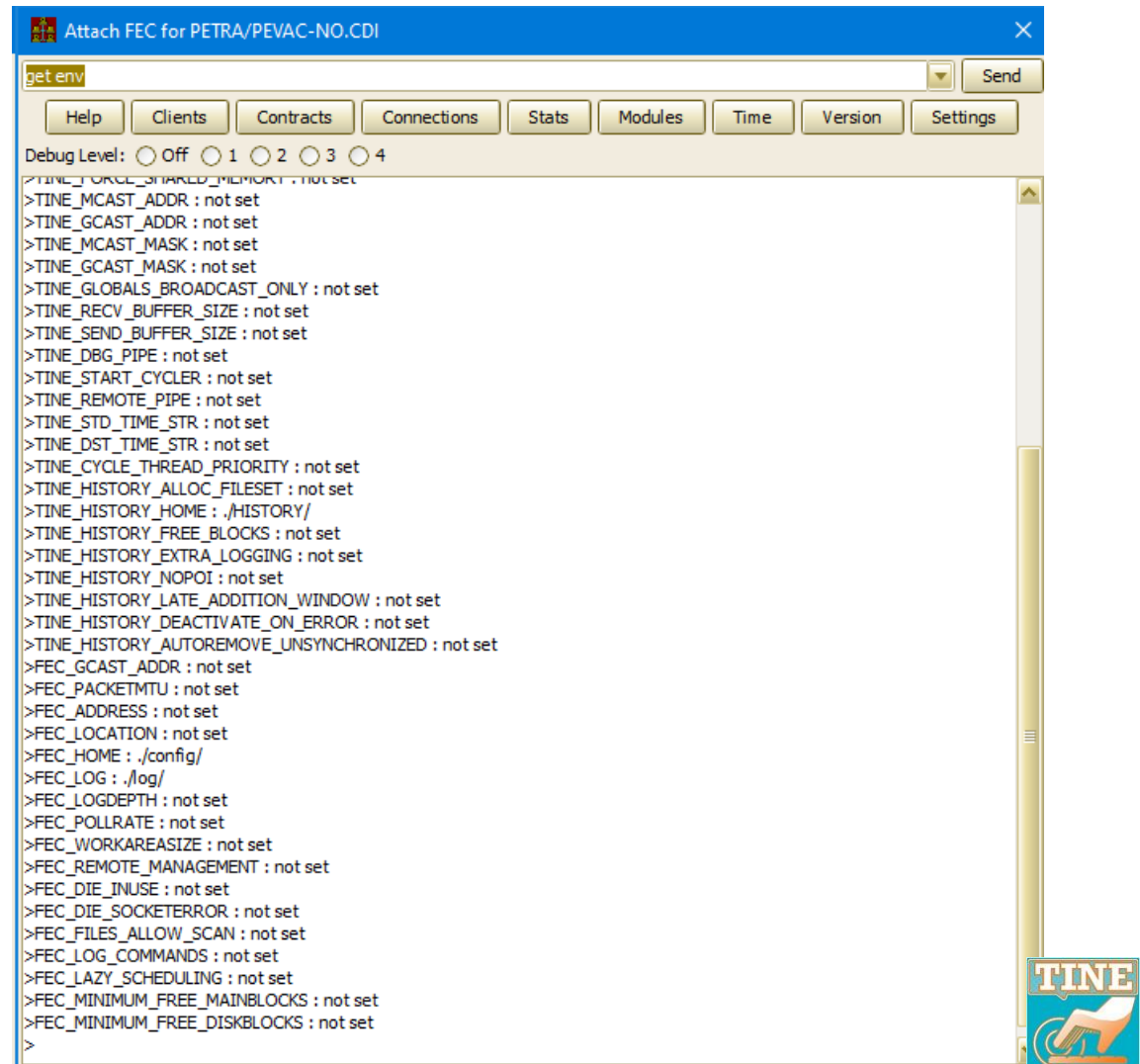
- API post System Init > Config File > Environment > API pre System Init



# Release 5.2.6

**TINE relevant  
environment variables :**

**“get env” to show  
current settings ...**



The screenshot shows a terminal window titled "Attach FEC for PETRA/PEVAC-NO.CDI". The terminal displays the output of the "get env" command, listing various environment variables and their current values. The variables are listed in a vertical column, with each line starting with ">". The variables include TINE-related settings like TINE\_MCAST\_ADDR, TINE\_GCAST\_ADDR, TINE\_MCAST\_MASK, TINE\_GCAST\_MASK, TINE\_GLOBALS\_BROADCAST\_ONLY, TINE\_RECV\_BUFFER\_SIZE, TINE\_SEND\_BUFFER\_SIZE, TINE\_DBG\_PIPE, TINE\_START\_CYCLER, TINE\_REMOTE\_PIPE, TINE\_STD\_TIME\_STR, TINE\_DST\_TIME\_STR, TINE\_CYCLE\_THREAD\_PRIORITY, TINE\_HISTORY\_ALLOC\_FILESET, TINE\_HISTORY\_HOME, TINE\_HISTORY\_FREE\_BLOCKS, TINE\_HISTORY\_EXTRA\_LOGGING, TINE\_HISTORY\_NOPOI, TINE\_HISTORY\_LATE\_ADDITION\_WINDOW, TINE\_HISTORY\_DEACTIVATE\_ON\_ERROR, TINE\_HISTORY\_AUTOREMOVE\_UNSYNCHRONIZED, and FEC-related settings like FEC\_GCAST\_ADDR, FEC\_PACKETMTU, FEC\_ADDRESS, FEC\_LOCATION, FEC\_HOME, FEC\_LOG, FEC\_LOGDEPTH, FEC\_POLLRATE, FEC\_WORKAREASIZE, FEC\_REMOTE\_MANAGEMENT, FEC\_DIE\_INUSE, FEC\_DIE\_SOCKETERROR, FEC\_FILES\_ALLOW\_SCAN, FEC\_LOG\_COMMANDS, FEC\_LAZY\_SCHEDULING, FEC\_MINIMUM\_FREE\_MAINBLOCKS, and FEC\_MINIMUM\_FREE\_DISKBLOCKS. The output ends with a prompt character ">".

```
Attach FEC for PETRA/PEVAC-NO.CDI
get env
Send
Help Clients Contracts Connections Stats Modules Time Version Settings
Debug Level:  Off  1  2  3  4
>TINE_FORCE_SHARED_MEMORY : not set
>TINE_MCAST_ADDR : not set
>TINE_GCAST_ADDR : not set
>TINE_MCAST_MASK : not set
>TINE_GCAST_MASK : not set
>TINE_GLOBALS_BROADCAST_ONLY : not set
>TINE_RECV_BUFFER_SIZE : not set
>TINE_SEND_BUFFER_SIZE : not set
>TINE_DBG_PIPE : not set
>TINE_START_CYCLER : not set
>TINE_REMOTE_PIPE : not set
>TINE_STD_TIME_STR : not set
>TINE_DST_TIME_STR : not set
>TINE_CYCLE_THREAD_PRIORITY : not set
>TINE_HISTORY_ALLOC_FILESET : not set
>TINE_HISTORY_HOME : ./HISTORY/
>TINE_HISTORY_FREE_BLOCKS : not set
>TINE_HISTORY_EXTRA_LOGGING : not set
>TINE_HISTORY_NOPOI : not set
>TINE_HISTORY_LATE_ADDITION_WINDOW : not set
>TINE_HISTORY_DEACTIVATE_ON_ERROR : not set
>TINE_HISTORY_AUTOREMOVE_UNSYNCHRONIZED : not set
>FEC_GCAST_ADDR : not set
>FEC_PACKETMTU : not set
>FEC_ADDRESS : not set
>FEC_LOCATION : not set
>FEC_HOME : ./config/
>FEC_LOG : ./log/
>FEC_LOGDEPTH : not set
>FEC_POLLRATE : not set
>FEC_WORKAREASIZE : not set
>FEC_REMOTE_MANAGEMENT : not set
>FEC_DIE_INUSE : not set
>FEC_DIE_SOCKETERROR : not set
>FEC_FILES_ALLOW_SCAN : not set
>FEC_LOG_COMMANDS : not set
>FEC_LAZY_SCHEDULING : not set
>FEC_MINIMUM_FREE_MAINBLOCKS : not set
>FEC_MINIMUM_FREE_DISKBLOCKS : not set
>
```





# [ Release 5.2.6 ]

a short review ...

- Registering a property to be handled in its own thread ...
  - *Why do this ?*
    - equipment module/property dispatch handler will *otherwise block all other access* until the called property has finished handling the request.
    - **usually:** the handler is just doing a ‘memcpy’ and takes almost no CPU time. But ... sometimes it does ‘more things’ ...
    - other clients might be timing out waiting for some request that gets stuck behind some slowpoke ...
    - recent examples:
      - PETRA BPM property “MAKETRIG” forwards a WRITE request to another ‘slow’ server which sometimes takes a lonnnnnng time ...
      - a ‘new’ Matlab Script was calling this property regularly and when the script was running, a multitude of links for standard ‘real’ BPM properties were then timing out on a multitude of clients
      - XFEL SEQUENCER taking a lonnnnnng time to read and return a ‘catalog file’ ...



# [ Release 5.2.6 ]

- Registering a property to be handled in its own thread ...
  - In addition to SetCallPropertyInSeparateThread()

```

int SetCallPropertyInSeparateThread(char *eqm, char *property, int value)
SetCallPropertyInSeparateThread()
Parameters:
    eqm is the local equipment module name, e.g. "BPMEQM".
    property is the property which is to be called.
    value determines whether the property is to be called specifically CA_WRITE|CA_INDEPENDENT|CA_TRIGGERED so as to not block other concurrent calls.
Returns:
    0 if successful, otherwise a TINE completion code.
    
```

```

void de.desy.tine.server.properties.TExportProperty.setRunInSeparateThread(boolean value)
Parameters:
    value is the desired setting.
    @brief
        Establishes whether a handler for this property is to be called in its own thread or not.
    
```

**NEW ->**

- also can add a "MT" to property Access in exports.csv

EXPORT_NAME	LOCAL_NAME	PROPERTY	PROPERTY_SIZE	FORMAT	PROPERTY_ID	ACCESS	DESCRIPTION
LBRENV	LBREQM	SA_X	248	float.CHANNEL	1	READ	[-2000:2000 'mm]SA X position
LBRENV	LBREQM	SA_Y	248	float.CHANNEL	2	READ	[-2000:2000 'mm]SA Y position
...	...	...	...	...	...	...	...
LBRENV	LBREQM	MAKETRIG	1	long.CHANNEL	90	WRITE MT INDEPENDENT	[-2000:2000 'mm]make an external trigger(0=none 2=injectio)
#							



# [ Release 5.2.6 ]

- Registering a property to be handled in its own thread ...
  - **WRITE** calls will normally still 'block' due to thread safety issues (but callers will see an 'operation busy' status rather than 'timeout').
  - **BUT:** the '**INDEPENDENT**' flag prevents a WRITE property from blocking access to the handler!
    - which is what is needed for BPM property MAKETRIG.
  - **Note:** some Stock Properties/Meta Properties are handled in a separate thread by default
    - **LOGFILE** properties
    - **.HIST** meta properties
      - doocs/tine issues ...

NEW ->



# [ Release 5.2.6 ]

- .HIST related doocs/tine issues ...
  - *.HIST calls are run on separate threads*
    - there can be  $> 1$  call being handled at the same time
    - **doocs2tine layer did not anticipate this** so ...
      - a doocs .HIST call via TINE could blow up if  $> 1$  active at the same time
      - problem fixed this past May !
      - problem became easier to notice (remember you need at least 2 on-going calls at the same time) because ...



# [ Release 5.2.6 ]

- that jddd Plot Widget ...
  - at some release began (effectively) synchronously polling histories (.HIST calls) if underlying address is a TINE address.
    - possible denial of service (especially on fragmented windows file systems)
    - more likely to have > 1 call to a server at the same time.



# Release 5.2.6

- New java call: *getTrendData()*

NEW ->

```
int de.desy.tine.histUtils.THistory.getTrendData(String context, String server, String property, String device, int index, int fieldIndex, int depthInSeconds, int interval, TCompoundDataObject[] data)
```

Gets the current trend of the targeted address. The call will start an asynchronous listener to obtain the current value and append it to the current trend data. Thus, the call can be made repeatedly (logically, not more often than the given update interval). When the call is NOT made repeatedly then after 5 minutes of idle time (i.e. without an additional call) then the listener will be stopped.

#### Parameters:

**context** is the targeted address context

**server** is the targeted address server

**property** is the property whose trend is desired

**device** is the targeted address device

**index** is the desired index (in case the target property represents an array)

**fieldIndex** is the desired field index (in case the target property is of a complex or structured format)

**depthInSeconds** is the desired trend depth in seconds (e.g. 3600 for 1 hour, 86400 for 1 day)

**interval** is the desired update interval (passed to the asynchronous listener)

**data** is the data object to hold the trend data (must be of data type DBLDBL (i.e. DBLTIME) or DBLDBLDBL)

#### Returns:

the number of data points in the 'data' array element with non-zero values (maximum is the array length of 'data')

- Can poll to your heart's content !



# [ Release 5.2.6 ]

- jdoocs makes use of this TINE call :

```
int de.desy.tine.histUtils.THistory.getArchivedData(String context, String server, String property, String device, int index, int fieldindex, double start, double stop, TCompoundDataObject[] data, THistorySource src, int timeout, boolean extendedRange)
```

Retrieves an archive data set. Retrieve an archive data set (value - timestamp pairs) for the target property and device given and over the time range specified. If server is null, an empty string, or "HISTORY", the central archive server is queried for the data. Otherwise the local history subsystem of the device server specified is queried.

**Parameters:**  
**context** is the desired context  
**server** is the device server which manages the archived parameter. If null then the central archive will

NEW ->

- so 'if (isJddd)' force this call to call getTrendData().



# Release 5.2.6

## History configuration tips ...

- both local and central archive allow a relative tolerance and/or an absolute tolerance.
  - i.e. commit to disk if

$$\text{Abs}(\text{thisValue} - \text{lastArchivedValue}) > \text{absoluteTolerance} + \text{lastArchivedValue} * \text{relativeTolerance}$$

- use relative tolerance when there's a large range between max and min (e.g. vacuum data).
- use absolute tolerance in most other cases
- how to configure ?
  - **File** : enter as percent with symbol % ...

Index	LocalName	Property	Device	DataLength	Format	Heartbeat	PollingRate	ArchiveRate	Tolerance	ShortDepth	LongDepth
102	SINEQM	Amplitude	#0	10	float	900	1000	1000	1 + 10%	600	1

- **API**: enter relative tolerance field as a fraction
  - i.e. 0.1 is 10%
- **Archive Database Manager**: also takes a 'fraction'

Keyword	Data Format	Size	Units	Max	Min
c.IonPumps.Pressure	FLOAT	600	mb	1.0E-4	1.0E-14
Abs. Tolerance	Rel. Tolerance	Plot Style	Offset	Scale	
0.0	0.15	LOG	0.0	1.0	

15 %





# Release 5.2.6

- *Those pesky umlauts ...*
  - what started out as a simple “why can’t I see my umlauts?” question
  - => turned into a shift in policy
  - ...
  - *Now*
    - categorically forbidden in address names.
    - replaced by pure Latin characters in all other texts.  
e.g. **ä** becomes **ae**

Property	Value
Alarm System	Kicker Septum
Device Server	Kicker.FehlerDiag.DESY2
Alarm Device	Kicker2_EInj
Device Text	Alarm Severity für diese Anlage ist FATAL
FEC Name	FehlerDiagTEST
Host Address	131.169.236.172
HostName	minw28443.desy.de
Location	MiddleLayer
Responsible	lump
Alarm Text	Beide Inj Kickern darf nicht gleichzeitig eingeschaltet sein
Severity	13
Alarm Data Text	no data associated with alarm
Alarm Tag	Inj Kicker Geräte Konflikt
URL	
Code	4605
Format	-1
Dimension	0

Alarm Descriptor	Alarm Time	Duration
Heartbeat	17:54:53.177 - Nov 02 CET	20.0 min

Alarm Data: no data associated with alarm

Set Alarm Definition Close

# [ Release 5.2.6 ]

- *Those pesky umlauts ...*
  - **The Problem:**
    - Windows (by default) uses **CP-1252** (an extended ascii), where those pesky umlauts are still 1 byte entities
      - windows claims “ÄäÖöÜüß” has a string length of 7
    - Linux (by default) uses **UTF8**, where those pesky umlauts are 2-byte entities.
      - linux claims “ÄäÖöÜüß” has a string length of 14
    - the lower 0-127 codes (normal English/Latin characters) are identical in both worlds, but you get into a heap of trouble mixing platforms with codes > 127 (i.e. < 0).
    - (unless you do something) your eclipse on windows is also using **CP-1252** whereas your eclipse on linux is using **UTF8**
    - français, español, etc. : same issues ...

# [ Release 5.2.6 ]

## ■ **PyTine new parameters ...**

- `PyTine.attach(...,access="WRITE",...)`
  - default = "READ"
  - WRITE => mode = SINGLE
- `PyTine.set(...,callable=fcn,...)`
- `PyTine.log(file=filename,message=text,...)`
  - writes to fec.log if file not given
- `PyTine.history(...,start=time,...)`
  - better control of 'from' -> 'to'
  - 'depth' is ignored if both start and stop are given.
  - 'flags' can specify "CONNECT" for TCP access.



# [ Release 5.2.6 ]

- **Time for the Bug of the Year !**
- (*Abendteuer Diagnose*)
  - **DESY2 Test-beam** Servers mysteriously crashing ~once/month almost between midnight and 2:00 a.m.
  - Servers are 'buffered servers'... but not running as simple background processes
    - there's a **GUI** using **ROOT** to plot things ...

# [ Release 5.2.6 ]

- *if TINE Server handles a history call*

- Then :

ensure that **endtime** > **starttime** and then

localtime(&**endtime**) => end

localtime(&**starttime**) => begin

Number of  
calendar days

*days total* = numDaysInTimeSpan(begin, end);

**BUT** *days total* was (on those crash occasions) < 0 !

- How was that possible ?



# [ Release 5.2.6 ]

- When **ROOT** plots something it (for whatever reasons) sets the current timezone to **GMT** and then sets it back when it's finished plotting.
  - As this is *multithreaded* it's possible that
    - *ROOT thread* is plotting and a history call is underway
    - switch to TINE server thread and `localtime(&endtime)` sees **timezone = GMT**
    - thread switches back to ROOT which finishes plotting and timezone is set back to CET (or CEST)
    - `localtime(&starttime)` now sees **Timezone = CET**
  - If this happens around midnight (i.e. CET midnight) GMT will claim it's **11:00 p.m. or so yesterday**, so it looks like
    - n.b. 'Summer' Time, CEST, will be 2 hours ahead of GMT

Start on Jan. 31, 2023 and end on Jan 30, 2023 !

**number of days = 30 – 31 = -1**

**Fixed this past spring**



# [ Release 5.2.6 ]

- **New command line tools !**  
e.g. tget, tmonitor, etc.  
well, now there's :
  - **taddtoarc** (a la taddtocas)
  - **wdogcheck**
  - **alminfocheck**

A slide from the last meeting ...

# Release 5.2.2

add many servers to  
a CAS with a script !

## ■ New command line utility: **taddtocas**

```
Command Prompt
H:\>taddtocas

Adds a server to the indicated central alarm server

Usage : taddtocas <context> <device server> /system=<alarm system> [/action=mailto:<address> /action=trigger:<event> /
action=annotate:<keyword> /code=<alarm code> /remove=<TRUE>]

<device server> can either be prefixed with the server's context or not, in which case the CAS
context will be assumed.
The 'system' option must be given to specify which alarm system the added server should belong to
You can add multiple 'action' options (e.g. multiple emails and/or events or annotations)
However, when actions are provided, then the 'code' option must also be provided so as to
indicate which alarm code should trigger the specified action(s)
An 'action' option must be prefixed with one of 'mailto:', 'trigger:', or 'annotate:'
The 'remove' option (set = TRUE) can be used to removed a server from the CAS. Note that the
'system' option must also be specified so as to properly identify the server entry in the CAS database.

e.g.
taddtocas SITE /SERVICE/WD_ACCLXSERVER1 /sys=Infrastructure

or
taddtocas SITE /SERVICE/WD_ACCLXSERVER1 /sys=Infrastructure /action=mailto:Donald.Trump@Skidrow.com /code=512

or
taddtocas SITE ARCHIVER /sys=Infrastructure /action=mailto:Donald.Trump@Skidrow.com /code=999

Finally: make sure to issue a 'RESET' command to the CAS so as to instruct it to re-read its database.

e.g.
tsend /SITE/CAS RESET

Also note that you must be a recognized CAS administrator to successfully use this tool.

H:\>_
```





# Command line tools

add many servers to central archive with a script !

- new command line utility: **taddtoarc**

```
Command Prompt
'addtoarc' is not recognized as an internal or external command,
operable program or batch file.

X:\>taddtoarc

Adds a server to the indicated central archive server

Usage : taddtoarc <context> <target address> <target property> [/k=<archive keyword> /s=<archive system> [/f=<format>
/l=<data length> /t=<tolerance>]

    <target address> can either be prefixed with the server's context or not, in which case the ARCHIVE server
    context will be assumed. In lieu of a 'target address' you can specify 'reload' as the second parameter.
    In such a case, all other input is ignored and a 'DB.RELOAD' command is sent to the central archive.
    The should be the final call to 'addtoarc' in any script which is designed to add entries to a central archiv
er.The 'keyword' option can (and should) be given to specify the desired archive keyword. If omitted, a best-guess o
f <server.property> will be assumed.
    The 'system' option can be given to specify which archive system the added server should belong to
    The 'format' option can be used to specify a storage format, if omitted, then the registered property datatyp
e will be used
    The 'length' option can be used to specify a data length, if omitted length=1 will be assumed (unless the for
mat option is also omitted)
    The 'tolerance' option can be used to specify an archive tolerance, append a '%' to indicate percent toleranc
e
e.g.
    taddtoarc TEST /PETRA/BPM Orbit.X

or
    taddtoarc TEST /PETRA/BPM Orbit.X /k=PetraOrbit.X

Finally: make sure to issue a 'reload' command so as to instruct the central archive to re-read its database.
e.g.
    taddtoarc TEST reload

Also note that you must be a recognized ARCHIVER administrator to successfully use this tool.
```



# Command line tools

The importance of  
watchdogs ...

The screenshot displays the 'Server and FEC Remote Control Panel for PETRA' interface. A 'Watchdog: SERVICE/WD\_ACCLXPESRV1.1' window is open, showing details for the 'BQCOMB' process. The process is currently running, with 0% CPU usage and 248.14 MB of memory. The 'Last Restart Reason' is 'NOT STARTED BY WATCHDOG'. The window includes a table of system metrics (Network Load, Process list) and a detailed configuration table for the BQCOMB process.

Setting	Value	Setting	Value
Alias	BQCOMB	Pause N Seconds After Start	1 s
Process Name	combulate	Number of Retries	5
Is Service	false	Retry Interval	20 s
Path	/export/tine/server/beamanglecomb/...	Autostart	YES
Startup Parameters	/s=BeamQuality /c=PETRA /h=BQC...	Max CPU Load	90 %
Match Parameters	true	No. of Allowed CPU Violations	5
Match Path	true	Max Memory	1000.0 MB
Working Directory	/export/tine/server/beamanglecomb/...	No. of Allowed Memory Violations	3
Console Caption		TINE Property	
Preceding Processes		Polling Rate	1000 ms
Environment Variables	TINE_HOME=/etc/tine/;	Timeout	10 s
Monitor N Seconds After Start	5 s	Timeout Restart	0 s

Should restart/start  
the server !

...  
but there needs to  
be some (adhered  
to) systematics in  
play !



# Command line tools

- wdogcheck [context] ... (default= SERVICE)

```
Command Prompt
WD_ACC10L2PULSERF ACC10L2PULSERF.0 131.169.154.226 0 WIN32 ACC10L2PULSERF OK
--- Process 1 --- SPECT2RF OK
WD_ACC10PESRV25 ACC10PESRV25.0 131.169.151.96 0 WIN32 ACC10PESRV25 OK
--- Process 1 --- PeIfmVA OK
--- Process 2 --- PeIfmVaX1 OK
--- Process 3 --- PeIfmVaDs OK
--- Process 4 --- PeIfmVA2D OK
--- Process 5 --- PeIfmVaX12D OK
--- Process 6 --- PeIfmVaDs2D OK
WD_ACC10PESRV24 ACC10PESRV24.0 131.169.151.95 0 WIN32 ACC10PESRV24 OK
WD_ACC10PESRV29 ACC10PESRV29.0 131.169.151.118 0 WIN32 ACC10PESRV29 OK
--- Process 1 --- P3BOPLASRV WARNING: server name used (possible
FEC = accw10persrv29)
WD_ACC10PESRV36 ACC10PESRV36.0 131.169.151.129 0 WIN32 ACC10PESRV36 OK
--- Process 1 --- TempCdi OK
--- Process 2 --- TempP3.12 OK
--- Process 3 --- TmpPrxy.5 OK
--- Process 4 --- TempP3ML OK
WD_ACC10PESRV21 ACC10PESRV21.0 131.169.151.99 0 WIN32 ACC10PESRV21 OK
--- Process 1 --- PeVA1 OK
--- Process 2 --- PeVaX1 OK
--- Process 3 --- PeVaDs OK
WD_ACC10PESRV37 ACC10PESRV37.0 131.169.151.135 0 WIN32 ACC10PESRV37 OK
--- Process 1 --- PETIMING.1 OK
--- Process 2 --- AutoTune.2 OK
WD_ACC10PEFOFBSVD ACC10PEFOFBSVD.0 131.169.151.92 0 WIN32 ACC10PEFOFBSVD OK
--- Process 1 --- BPM_disable WARNING: Not a registered FEC!
--- Process 2 --- LiberaSync WARNING: Not a registered FEC!
--- Process 3 --- PostMortem WARNING: Not a registered FEC!
--- Process 4 --- ReadOutTemp WARNING: Not a registered FEC!
--- Process 5 --- MPdpaACC10PEFOFB OK
--- Process 6 --- ACC10PEFOFBSVDTE OK
--- Process 7 --- CANaACC10PEFOFBS OK
--- Process 8 --- FOFB_Logger WARNING: Not a registered FEC!
WD_ACC10RGSRV08 ACC10RGSRV08.0 131.169.153.126 0 WIN32 ACC10RGSRV08 OK
--- Process 1 --- RF.RgModulator OK
```



# Command line tools

## ■ alminfocheck

Scans the alarm definitions for the given context and outputs those meeting the comparison criteria

Usage : alminfocheck /c=<context> /<field><comparison><value> [/d=debug level]

<field> can be 'severity' or 'system'  
e.g. alminfocheck /c=TEST /severity^>=8

(note the escape '^' character needed when > or < are used.)

e.g. alminfocheck /c=PETRA /severity^>=12

```
--- VAC.HF_ION_PUMP : found 6 alarm definitions ---
--- ARCHIVER.MSTR : found 3 alarm definitions ---
--- LBRENV : found 11 alarm definitions ---
--- BMS_FEC : found 5 alarm definitions ---
    those with severity >= 12:
    Bunch Marker out of range (code = 5304, severity = 13, system = 951)
    fan fail (code = 5303, severity = 13, system = 951)
    no RF (code = 5302, severity = 13, system = 951)
    no Beam Detekt (code = 5301, severity = 13, system = 951)
    pll out of loop (code = 5300, severity = 13, system = 951)
--- Mag.Corr-EXL : found 92 alarm definitions ---
    those with severity >= 12:
    SEDAC Modul nicht erreichbar (code = 635, severity = 13, system = 2050)
    RMS Fehler (code = 634, severity = 13, system = 2050)
    Regelung ueberschritten: PI (code = 632, severity = 13, system = 2050)
    Regelung ueberschritten: WI (code = 631, severity = 13, system = 2050)
    Regelung ueberschritten: GI (code = 630, severity = 13, system = 2050)
    Keine Magnetfreigabe (code = 629, severity = 13, system = 2050)
```

# [ Central Services ]

- **Central Services ...**

- ENS (and GENS)
- Central Archive Server
  - *HISTORY server is now multi-threaded*
- Event Archive Server
  - *is now multi-threaded*
- Central Alarm Server
  - *now support 'informational alarms'*
- State Server
- Statistics Server
- Globals Server (and Time Synchronization Server)
- Cyclor



# Central Services

- Specialty Services ...

- **Repeater**

New ->

- now forwards full status error string for a listening link with an error
- sets an alarm for any (non-timeout) link errors.

- **Combobulator**

**discombobulated**

adjective

dis·com·bob·u·lat·ed dis-kəm-'bä-b(y)ə-lā-təd

Synonyms of discombobulated

**informal**

: characterized by confusion or disorder

- **Configurable middle layer server**

- Great for making multi-channel arrays, centralizing a collection of servers ...
  - e.g. **XFEL Modulators, PETRA Beam Quality, Tango2Tine gateways**

...

New ->

- sets an **alarm** for link errors
- see: [TINE API: TINE API for Console Applications \(desy.de\)](https://desy.de/tine-api/)

**Coming soon: combobulator  
database manager !**



# Central Services

New kid on the block !

- Central Services ...
  - Settings Server
    - avoids using mailbox files on some file system!

'standard' settings for various dump energies

+ ability to tweak ...

Java Instant Client

Context: Subsystem ALL, Server R/WegSettings, Device MR-8, Property DumpSettings.500MeV

Data Size: 10, Data Type: FLOAT, DumpSettings.500MeV settings

/DES2/R/WegSettings/MR-8 DumpSettings.500MeV @ 2022-Jul-19 11:11

- MR-8: -102.655
- QR-2: -9.981
- QR-12: 29.993
- Kicker 24R: 1.4
- Septum 26A: 47.997
- Septum 26B: 47.997
- doTurns: 79490.0
- Kicker Bump: 0.0
- Bump Trigger: 0.0
- SVR-14: 0.015

Settings: UDP, Timer | Suppress QueryProperties, Property Query Precedence Last request: 11:32:03.571 (0 ms)

R/Weg Currents and Settings

R-Weg Currents

Minutes

particles (e<sup>-</sup>/y)

Sep 08 17:16:56.288 2022

Legend: R11, R06, R22

Camera R020: on, Screen: out, LED: on

Component	current readback	desired setting	Unit
MR-8	0.000	-102.655	A
QR-2	0.000	-9.981	A
QR-12	0.000	29.993	A
Kick. 24R	1.399	1.4	kV
Sept. 26A	55.935	47.997	V
Sept. 26B	41.488	47.997	V
SVR-14	0.000	0.015	A

turns energy: 0.5256, dump energy: 500 MeV

turns: 161000, current readback: 79490, desired setting: 79490

Kick. bump: 0.000, Trigg. bump: OFF

frame: 12514

08-Sep-2022 17:16:55

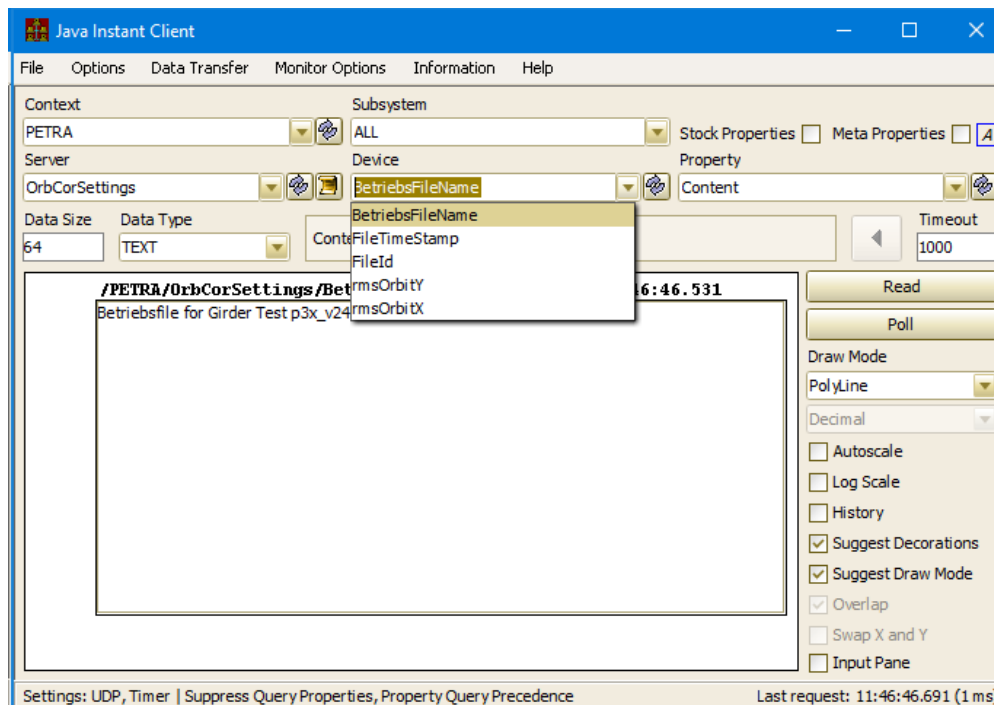
Settings Server to the rescue !



# Central Services

## ■ Settings Server

- *easiest server to write ever ...*
  - reads a database (“devices” and “properties”)
  - makes use of *save-and-restore*, local *histories* of all settings properties
- another example (orbit correction) :





# Central Services

## Settings Server database manager :

The screenshot shows the 'Settings Servers Database Manager' application window. The title bar reads 'Settings Servers Database Manager'. The main interface is divided into several sections:

- Selected Settings Database:** A dropdown menu shows 'DESY2' and 'RWegSettings'. Below it are 'Write' and 'Reload' buttons. A list of settings is displayed, including 'DumpSettings.500MeV, Kicker Bump, 1 float: 0' and 'DumpSettings.1GeV, MR-8, 1 float: -212.4 A'. A 'Remove' button and an 'Add/Edit' button are also present.
- Property Details:** On the right, a 'property' field contains 'DumpSettings.1G', and other fields include 'device: MR-8', 'size: 1', 'format: float', 'units: A', and 'default value: -212.4'.
- Settings for DumpSettings.1GeV (MR-8):** This section has 'Apply Current' and 'Apply Stored Value' buttons. A 'from:' dropdown is set to '7/19/2022 11:32:39 AM'. A table compares 'Current Value' and 'Stored Value' for various parameters. A list of timestamps is shown, with '5/4/2022 4:01:15 PM' selected. On the right, it shows '/DESY2/RWegSettings', 'started: Tue Jul 19 11:32:39 2022', an 'access lock' checkbox (unchecked), and 'Settings locked by: no lock active'. A list of 'Invited users' includes DUVAL, HAUPTD, DESYCON, HEIKO, STANITZ, and BREDE.

The taskbar at the bottom shows icons for Print, a graph, a red circle, and 'CMDs'. The system tray includes 'MCS10DUVAL01', 'Acop.net 3.7.9', and the date/time '30-Jan-2023 11:49:58'.



# Central Services

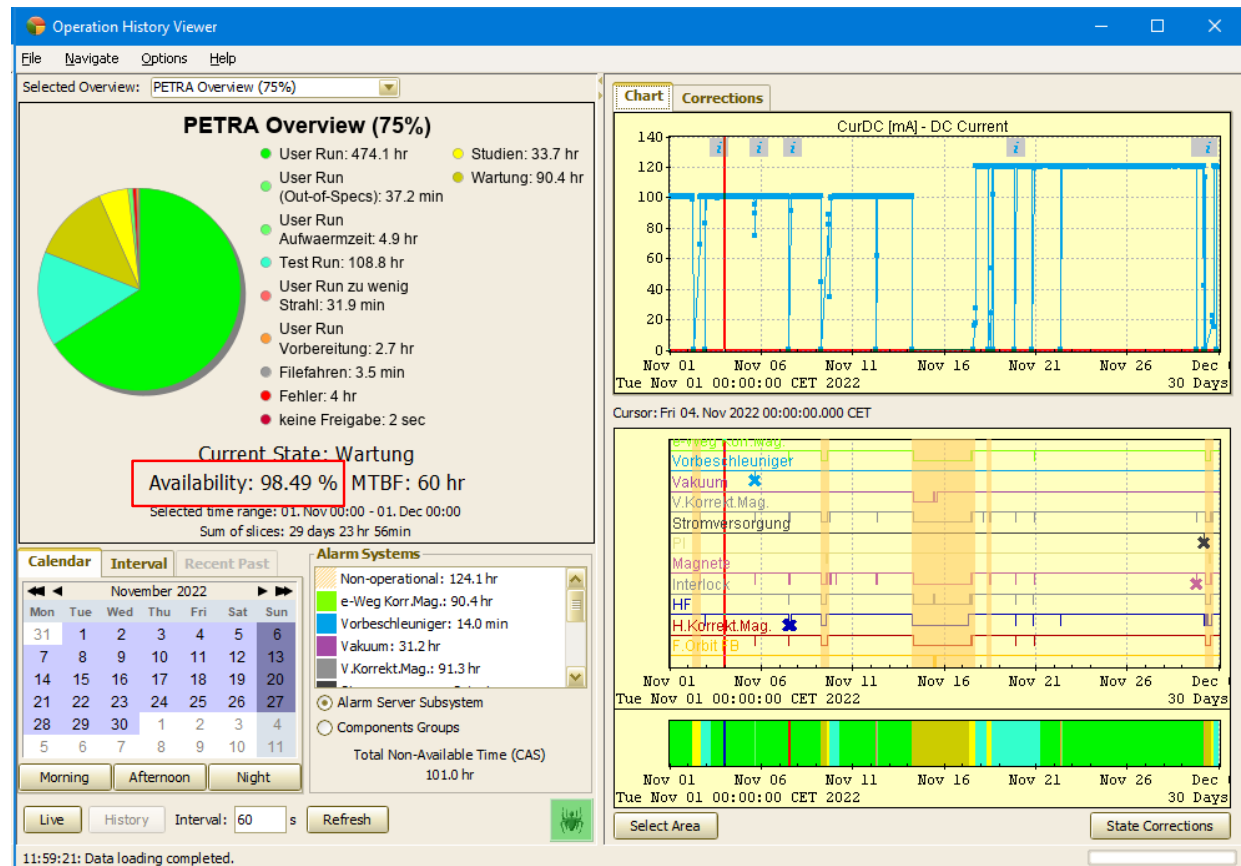
Another new kid on the block !

## Central Services ... Availability Server

The Idea:  
can I have a  
running account  
of the current  
availability ?

i.e. a number I  
can use as a live  
update in  
applications ?

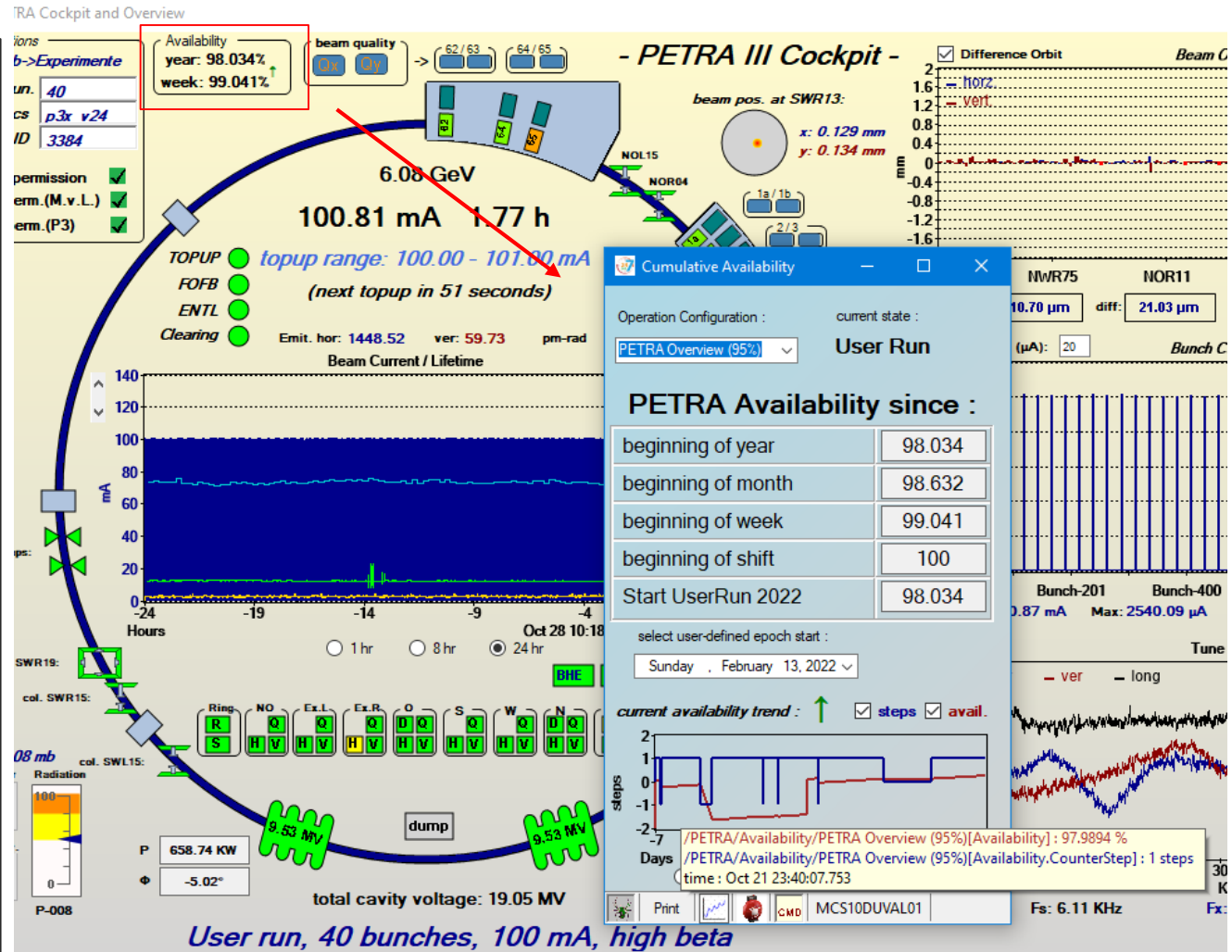
Requires:  
State, Alarm, and  
Archive Servers ...



# Central Services

## Availability Server

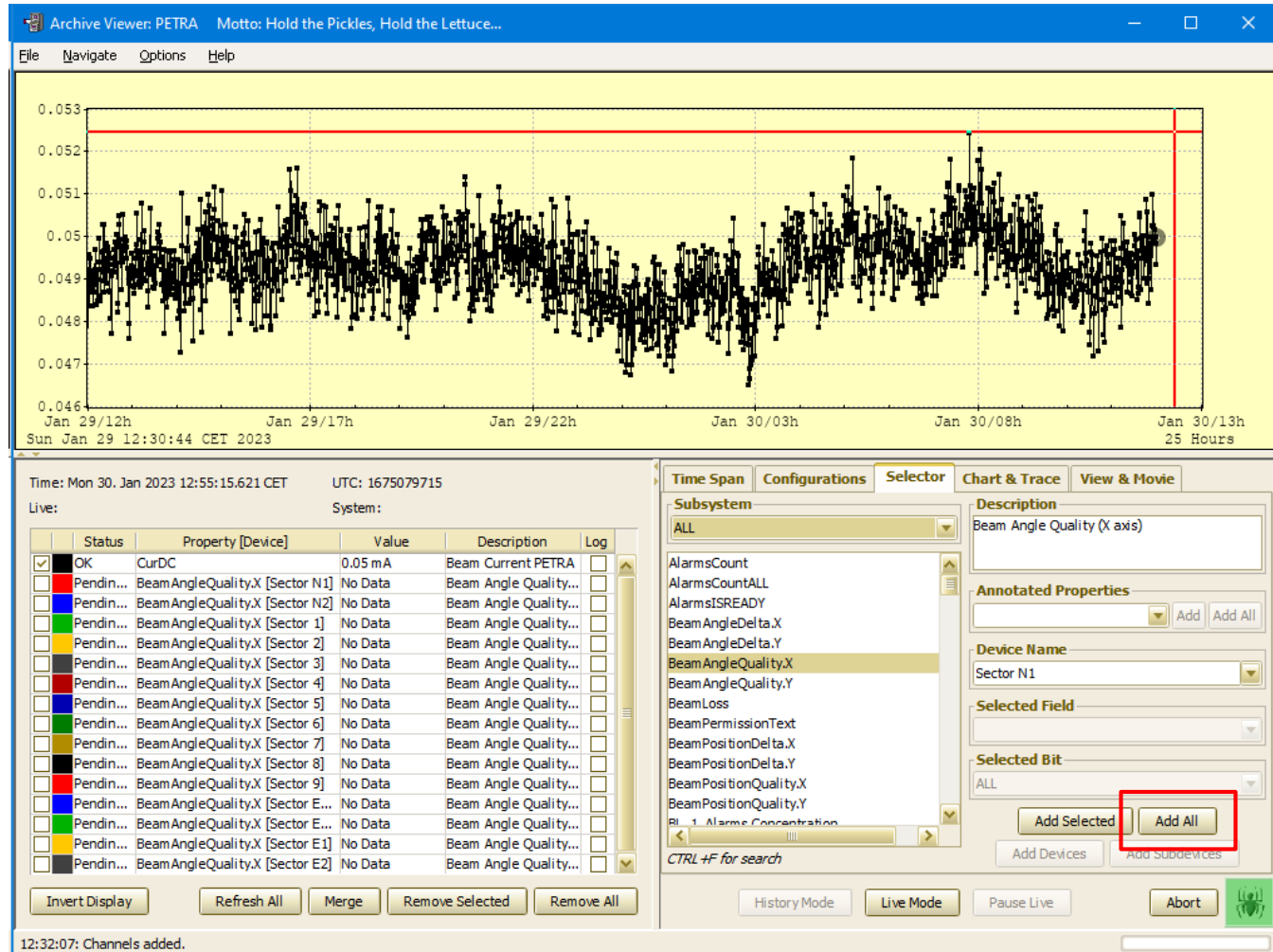
- keeps running account of cumulative availability (over 5 epochs)
- applies any state 'corrections' which ensue to both live and history data
- add info to Linac2, Desy2, and Petra cockpits



# TINE Studio : Archive Viewer

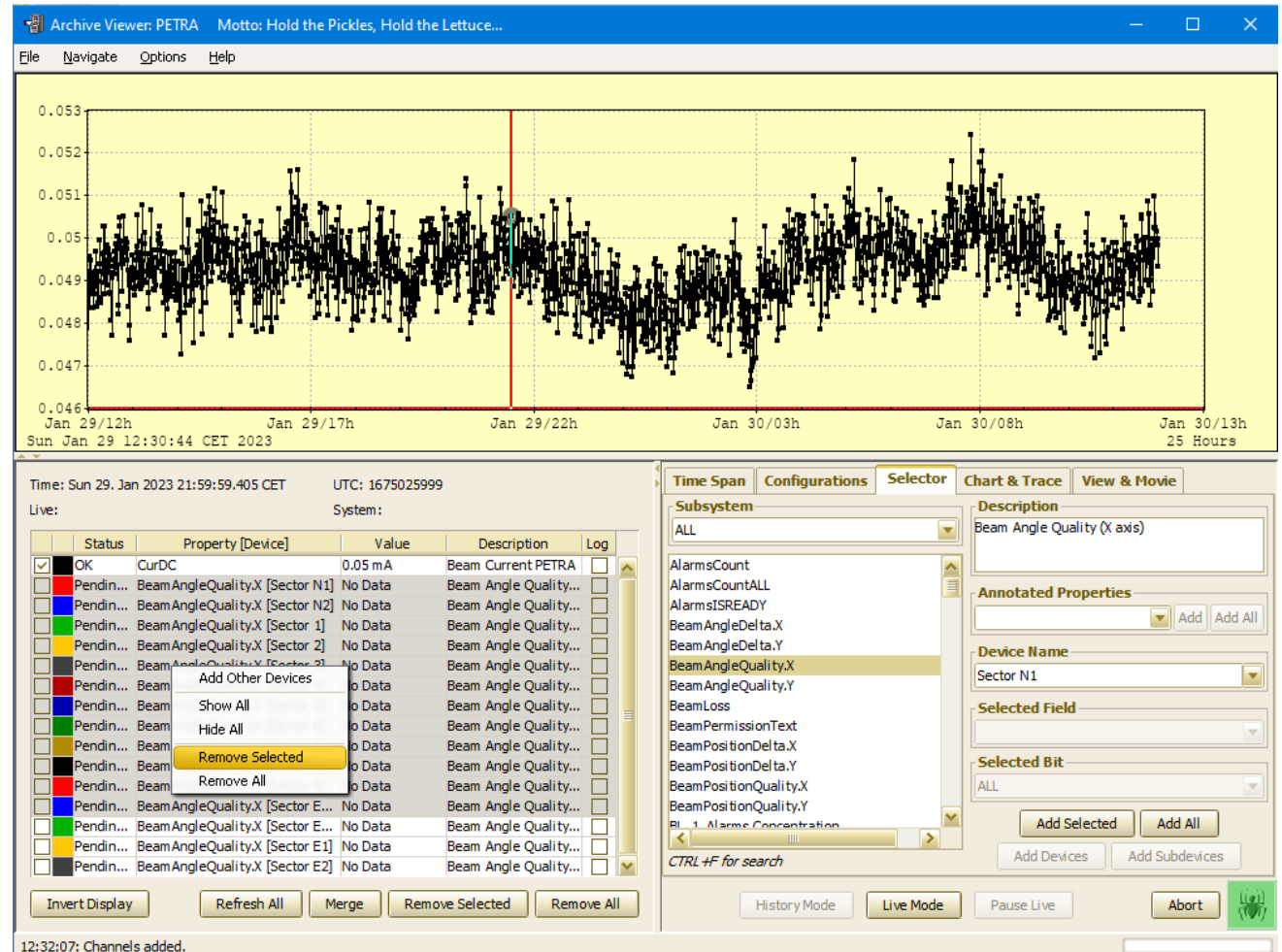
Hit the 'Add All' button and now all channels are 'Pending' ...

i.e. no waiting while the trends of all channels are obtained



# TINE Studio : Archive Viewer

Select and  
 - remove if  
 you don't  
 want these  
 - check one  
 of the check  
 boxes if you  
 do want  
 them



# TINE Studio : Alarm Viewer

Can now display 'information' messages if desired  
 Information messages can also be configured to send Emails ...

The screenshot shows the TINE Studio Alarm Viewer interface. A context menu is open over the 'Alarms' section, with the option 'Show Information Messages' selected. The interface displays a summary table of alarm counts for various systems and categories.

System	BC	ACC	TCOL	ECOL	ORS	UND	DUMP	EXP	
Mon Jan 3	12	18	1	Severity >= 0 Selected/Total No. of Alarms: 31/31 Active Alarms Only (2 Disabled)					
Magnets	0	0	0	0	0	0	0	0	
RF	1	0	12	9	0	0	0	0	
Vacuum	0	0	0	0	Diagnostics				
					0	0	8	1	
								Controls	
								1	
								Services	
								0	
								PI	
								0	
								Radiation	
								0	
								0	
								0	

System	Device Name	Source	Message	Sev	Alarm Descriptor	Alarm Start Time	Duration
Diagnostics	M-004	RadMonIP_Marvin	No Scintillator	8	Heartbeat	12:22:59.907 - Jan 30 CET	20.0 min
Diagnostics	M-003	RadMonIP_Marvin	Connection lost for > one hour.	8	Heartbeat	12:22:51.594 - Jan 30 CET	20.0 min
Diagnostics	BTM-1	RadMonIP_STOPPERS.RESERV...	Bedarf-Request Property	0	Heartbeat	07:00:30.498 - Dec 27 CET	34.2 days
Diagnostics	H-804	RadMonIP_HED	Connection lost for > one hour.	8	Heartbeat	07:00:29.640 - Dec 27 CET	34.2 days
Diagnostics	H-805	RadMonIP_HED	Connection lost for > one hour.	8	Heartbeat	07:00:29.640 - Dec 27 CET	34.2 days
Diagnostics	B1D	BEAM_ENERGY_MEASUREMENT	offline: offline	1	Heartbeat	13:13:52.833 - Jan 18 CET	11.9 days
Diagnostics	B2D	BEAM_ENERGY_MEASUREMENT	offline: offline	1	Heartbeat	13:13:52.835 - Jan 18 CET	11.9 days
Diagnostics	HXRSS01	BEAM_ENERGY_MEASUREMENT	offline: offline	1	Heartbeat	13:13:52.841 - Jan 18 CET	11.9 days
Diagnostics	HXRSS02	BEAM_ENERGY_MEASUREMENT	offline: offline	1	Heartbeat	13:13:52.841 - Jan 18 CET	11.9 days

12:44:44: Alarms loaded.

# [ Odds and Ends ]

- TINE\_RESTful
  - web apps using IONIC, REACT ...
- Future TINE Web Site
  - build and deploy strategies ...