

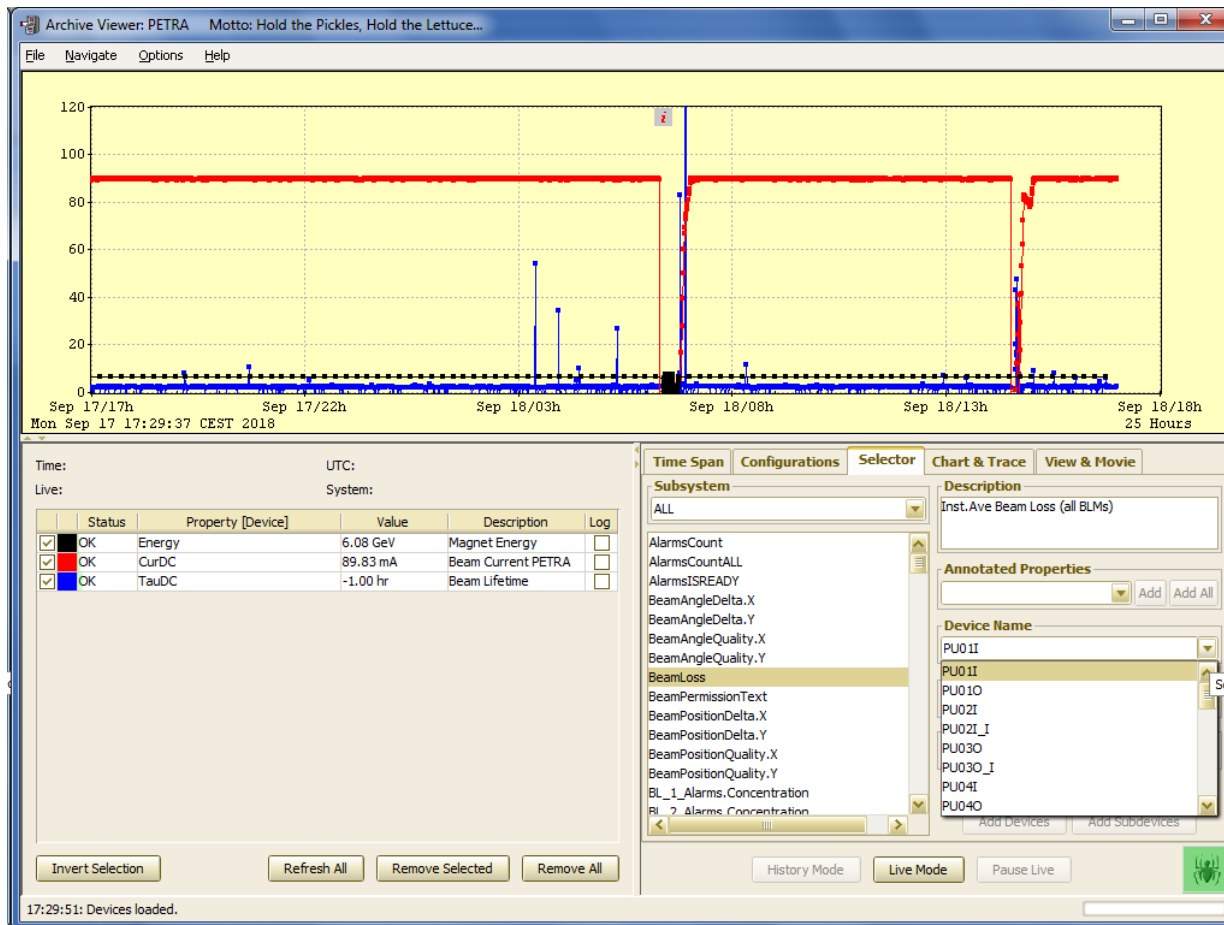
TINE Studio News

Sep 19, 2018

The Archive Database Manager and other interesting tales ...

Archive Viewer

- Making life easy for yourself and others trying to look at archive data ...



Archive Data ...

- **Local archive** kept at the server
 - Not kept '*forever*' and there's no systematic backup ...
 - Usually configured by the server developer ...
 - Filtered on tolerance or other criteria supplied by the developer.
- **Central archive**
 - Kept '*forever*' ! And always on-line (you can still get HERA data from 1996 if you want ...)
 - Configured by an ADBM admin.
 - Data come from a targeted server and are converted into an archive record identified by a **keyword**.
 - Filtered on tolerance and various other systematically known criteria.
- Archive Viewer asks both local and central for the amount of data stored over a time range and makes the best decision possible as to which source to use.

Central Archive Data ...

- There must be a server who can deliver the data (target server)
- The delivered data *can* be
 - Partitioned
 - Shifted or scaled prior to archive.
 - Assigned a proper timestamp if the target timestamp is not trustworthy
 - Assigned to an archive subsystem
 - Assigned units and max/min settings
- The delivered data *must* be
 - Assigned at least one keyword !
- *Keywords are properties* !
- The Central Archive Server is a 'property' server
 - A selected property can have its own set of associated devices!
 - => the property is then a Multi-Channel Array (**MCA**) !

Archive Viewer

- Multi-Channel Arrays ...

The screenshot displays the Archive Viewer software interface. The main window is titled "Archive Viewer: PETRA" and contains several panels:

- Top Panel:** A large plot area showing a multi-channel array. The left y-axis ranges from 0 to 100, and the right y-axis is logarithmic, ranging from $1e-14$ to $1e-4$. The x-axis shows time from Sep 17/17h to Sep 18/13h. A red horizontal line is drawn at approximately 60 on the left axis. Two vertical blue lines are present at approximately Sep 18/03h and Sep 18/13h. The plot shows a noisy signal that drops significantly at the vertical lines.
- Right Panel (Selector):** A list of subsystems and devices. The "Vacuum" subsystem is selected, and "Vac.IonPumps.Pressure" is highlighted. Below it, a list of devices is shown, with "OL153.7" selected.
- Bottom Left Panel:** A table showing the status of the selected device.

Status	Property [Device]	Value	Description	Log
OK	Vac.IonPumps.Pressure [OL153.7]	1.86E-08 mb		<input checked="" type="checkbox"/>
- Bottom Right Panel:** Configuration options for the array chart.
 - Charts:** Main Chart, Correlation Chart, Array Chart.
 - Array Chart Options:** Axis Scale: LOG, Bit Breakdown, Lock Axis, SimpleHistogram.
 - Corr. Chart Options:** Axis Scale (X-Y): LIN-LIN.
 - Array Options:** All Devices, Devices, Subdevices. Includes "Start Movie" and "Stop Movie" buttons, a range slider from 871 to 1216, and "Display Ref" and "Sub Ref" checkboxes.

At the bottom of the window, a status bar reads: "09:58:59: Array data for channel 'PETRA/HISTORY/OL153.7/Vac.IonPumps.Pressure' loaded."

Archive Database Manager

- 2 Entries !
 - get the Array of data
 - Get the channel names (store as <keyword.NAM> ...

Archive Database Manager: PETRA

File Configurations Navigate Options Help

Database Entries

Index	Active	Device Server	Device Name	Device Property
38	ENABLED	Bunche_PETRA_Main	IMA	NumBunches
39	ENABLED	GlobalsCollector	#0	Energy
40	ENABLED	VAC.ION_PUMP	*	P
41	ENABLED	VAC.ION_PUMP	*	P
46	ENABLED	PIConditions	beamStoppersIns...	expertState
47	ENABLED	Idc	#0	Ladung
60	ENABLED	Cms.PsGroup	EwCorr	GroupDevices
61	ENABLED	Cms.PsGroup	EwCorr	Strom.Ist
62	ENABLED	Cms.PsGroup	EwCorr	Strom.ImS
63	ENABLED	Cms.PsGroup	EwCorr	Strom.Soll
64	ENABLED	Cms.PsGroup	EwMain	GroupDevices
65	ENABLED	Cms.PsGroup	EwMain	Strom.Ist

Index: 40

Tweak Clone New Add MCA Names

Data Collection Configuration

Context
PETRA Server: VAC.ION_PUMP

Device
* Property: P

Format
USTRING **Array Size**
500 **Input Format**
NULL **Data Input**

Filtering of Data Storage

NEVER ONCE ALWAYS FAST

SLOW FIXTIME HRT STATUS

VOLATILE NOPOI BEAM RUNNING

Access Rate
1000 ms

Archive Heartbeat
36096 sec

Property Viewing Configuration

Vac.IonPumps.Pressure.NAM,USTRING,500,none,100.0,0.0,1.0,0.0,LIN,1.0,0.0,,,Vacuum

Maximum size [bytes]: 48000 Remaining elements: 0

Keyword	Data Format	Size	Units	Max	Min
Pumps.Pressure.NAM	USTRING	500	none	100.0	0.0

Abs. Tolerance 1.0 **Rel. Tolerance** 0.0 **Plot Style** LIN **Offset** 0.0 **Scale** 1.0

Description **Subsystem** Vacuum Associate:

Bind To: Spectrum Axis: Min Max Units

Apply Add Remove

There are ~500 pumps.
Do you really want to enter 500
different keywords in the ADBM?

Archive Database Manager

Some things are crying to be an MCA entry ...

Archive Database Manager: PETRA

File Configurations Navigate Options Help

Database Entries

Index	Active	Device Server	Device Name	Device Property
569	ENABLED	UNDBPOS	Zelle0	Xangle.NAM
570	ENABLED	UNDBPOS	Zelle0	Xangle
571	ENABLED	UNDBPOS	Zelle0	Yangle.NAM
572	ENABLED	UNDBPOS	Zelle0	Yangle
573	DEFUNCT	HASYLAB/Petra3_P10vil.CDI	BOX_1_OK	P10
574	DEFUNCT	HASYLAB/Petra3_P10vil.CDI	#0	P10.NAM
575	ENABLED	HASYLAB/Petra3_P09vil.CDI	KW_FROND_1_E	DURCHFLUSS_OUT.NAM
576	DEFUNCT	GlobalsCollector	Keyword	BeamXAngleDeltaCell0
577	DEFUNCT	GlobalsCollector	Keyword	BeamXAngleDeltaCell1
578	DEFUNCT	GlobalsCollector	Keyword	BeamXAngleDeltaCell2
579	DEFUNCT	GlobalsCollector	Keyword	BeamXAngleDeltaCell3
580	DEFUNCT	GlobalsCollector	Keyword	BeamXAngleDeltaCell4
581	DEFUNCT	GlobalsCollector	Keyword	BeamXAngleDeltaCell5
582	DEFUNCT	GlobalsCollector	Keyword	BeamXAngleDeltaCell6
583	DEFUNCT	GlobalsCollector	Keyword	BeamXAngleDeltaCell7
584	DEFUNCT	GlobalsCollector	Keyword	BeamXAngleDeltaCell8
585	DEFUNCT	GlobalsCollector	Keyword	BeamYAngleDeltaCell0
586	DEFUNCT	GlobalsCollector	Keyword	BeamYAngleDeltaCell1
587	DEFUNCT	GlobalsCollector	Keyword	BeamYAngleDeltaCell2
588	DEFUNCT	GlobalsCollector	Keyword	BeamYAngleDeltaCell3
589	DEFUNCT	GlobalsCollector	Keyword	BeamYAngleDeltaCell4
590	DEFUNCT	GlobalsCollector	Keyword	BeamYAngleDeltaCell5
591	DEFUNCT	GlobalsCollector	Keyword	BeamYAngleDeltaCell6
592	DEFUNCT	GlobalsCollector	Keyword	BeamYAngleDeltaCell7
593	DEFUNCT	GlobalsCollector	Keyword	BeamYAngleDeltaCell8
594	DEFUNCT	GlobalsCollector	Keyword	BeamXPosDeltaCell0
595	DEFUNCT	GlobalsCollector	Keyword	BeamXPosDeltaCell1
596	DEFUNCT	GlobalsCollector	Keyword	BeamXPosDeltaCell2
597	DEFUNCT	GlobalsCollector	Keyword	BeamXPosDeltaCell3
598	DEFUNCT	GlobalsCollector	Keyword	BeamXPosDeltaCell4
599	DEFUNCT	GlobalsCollector	Keyword	BeamXPosDeltaCell5
600	DEFUNCT	GlobalsCollector	Keyword	BeamXPosDeltaCell6
601	DEFUNCT	GlobalsCollector	Keyword	BeamXPosDeltaCell7
602	DEFUNCT	GlobalsCollector	Keyword	BeamXPosDeltaCell8

Reload DB Write DB Unlock DB DB locked by DUVAL

Index: 1278

Data Collection Configuration

Context: PETRA Server: Undulator

Device: PU00 Property: Gap

Format: FLOAT Array Size: 28 Input Format: NULL Data Input: [Empty]

Filtering of Data Storage

NEVER ONCE ALWAYS FAST

SLOW FIXTIME HRT STATUS

VOLATILE NOPOI BEAM RUNNING

Access Rate: 1000 ms

Archive Heartbeat: 900 sec

Property Viewing Configuration

Undulator.Gap.Test,FLOAT,1,mm,220.0,7.0,0.01,0.0,LIN,1.0,0.0,Gap Width in mm,,,Experiments

Undulator.Gap,FLOAT,27,mm,220.0,7.0,0.01,0.0,LIN,1.0,0.0,Gap Width in mm,,,Experiments

Maximum size [bytes]: 112 Remaining elements: 0

Keyword	Data Format	Size	Units	Max	Min
Undulator.Gap	FLOAT	27	mm	220.0	7.0

Abs. Tolerance	Rel. Tolerance	Plot Style	Offset	Scale
0.01	0.0	LIN	0.0	1.0

Description: Gap Width in mm Subsystem: Experiments Associate: [Empty]

Min Max Units

Bind To: [Empty] Spectrum Axis: [Empty] [Empty] [Empty]

Apply Add Remove

Archive Database Manager

- When the target property doesn't offer a multi-channel array
 - The Combobulator to the rescue ...

The screenshot displays the Archive Database Manager interface. On the left, a CSV file named 'combobulate.csv' is open, showing a table with columns A through J. The table contains data for various servers and properties, including pressure readings and device identifiers.

	A	B	C	D	E	F	G	H	I	J
1	SERVER	PROPERTY	PROPERTY_ALIAS	DEVICE	DEVICE_ALIAS	FORMAT	CAPACITY	DESCRIPTION	SHIFT	SCALE
2	/PEX/TangoTineGw2-P04	Pressure	Pressures	p04/centerthree/vacuum.guard.Pi	guard_PGM	double	1	[0:1000 mb]guard_PGM	0	1
3	/PEX/TangoTineGw2-P04	Pressure	Pressures	p04/centerthree/2.pgm	PGM_2	double	1	[0:1000 mb]PGM 2 pres	0	1
4	/PEX/TangoTineGw-P04	Pressure	Pressures	p04/centerthree2.2/2.cb.ga						
5	/PEX/TangoTineGw-P04	Pressure	Pressures	p04/centerthree2.2/3.vv.cb						
6										
7	/PEX/TangoTineGw2-p04	Pressure	Pressures	p04/centerthree/1.pgm						
8	/PEX/TangoTineGw-P04	Pressure	Pressures	p04/centerthree2.1/1.exsu						
9	/PEX/TangoTineGw-P04	Pressure	Pressures	p04/centerthree2.1/2.filter						
10	/PEX/TangoTineGw-P04	Pressure	Pressures	p04/centerthree2.1/3.rmu						
11	/PEX/TangoTineGw-P04	Pressure	Pressures	p04/centerthree2.2/1.exp						
12										
13	/PEX/TangoTineGw-P04	Pressure	Pressures	p04/centerthree2.3/1.diff1						
14	/PEX/TangoTineGw-P04	Pressure	Pressures	p04/centerthree2.3/2.cb						
15	/PEX/TangoTineGw-P04	Pressure	Pressures	p04/centerthree2.3/3.diff2						
16										
17	/PEX/TangoTineGw2-P04	Pressure	Pressures	p04/centerthree/1.filter						
18	/PEX/TangoTineGw2-P04	Pressure	Pressures	p04/centerthree/1.rmu						
19	/PEX/TangoTineGw2-P04	Pressure	Pressures	p04/centerthree/1.exsu						
20	/PEX/TangoTineGw2-P04	Pressure	Pressures	p04/centerthree/1.diff						
21	/PEX/TangoTineGw2-P04	Pressure	Pressures	p04/centerthree/1.cb						
22	/PE									
23	/PE									
24	/PE									
25	/PE									

Overlaid on the CSV is a Java Instant Client window. The 'Context' is set to 'PEX', 'Subsystem' to 'ALL', 'Server' to 'TTTT04.ML', and 'Device' to 'guard_PGM'. The 'Property' is 'Pressures'. The 'Data Size' is '18' and 'Data Type' is 'DOUBLE'. The 'Timeout' is '1000'. The window displays a list of pressure values for the 'guard_PGM' property, such as 'guard_PGM: 581.0', 'PGM_2: 1000.0', 'CB_2_gas_inlet: 0.178', etc.

Unfortunately there is no combobulator editor other than excel ... (new job for Cosylab?)

Archive Database Manager

- The ADBM will suggest the Keyword name <server>.<property> (good chance of being unique!)
- But: P3MagTempProxy.Temperature is rather clumsy.
- Better: let the Archive Viewer user see something easier to digest ...

The screenshot displays the Archive Database Manager (ADBM) interface. On the left, a table lists various devices with columns for Index, Active status, Device Server, Device Name, and Device Property. Index 119 is highlighted, corresponding to the configuration panel on the right.

Index	Active	Device Server	Device Name	Device Property
66	ENABLED	Cms.PsGroup	EwMain	Strom.Ims
67	ENABLED	Cms.PsGroup	EwMain	Strom.Soll
84	ENABLED	TermoLogger	#0	TERMOLOG_ARRAY
85	ENABLED	TermoLogger	#0	DEVICES
86	ENABLED	VAC.ION_PUMP	SEK.*	P.MEAN
87	ENABLED	VAC.ION_PUMP	SEK.*	P.MEAN
88	ENABLED	Kicker	Kicker1_Inj	DelayALLARC
89	ENABLED	Kicker	#0	DEVICES
90	ENABLED	Kicker	Kicker1_Inj	HWall
119	ENABLED	P3MagTempProxy	#0	Temperature
120	ENABLED	P3MagTempProxy	#0	Name
121	ENABLED	P3MDITempProxy	#0	Temperature
122	ENABLED	P3MDITempProxy	#0	Name
125	ENABLED	P3MagTempProxy	#0	MaxTemperature
126	ENABLED	P3MagTempProxy	#0	MinTemperature
127	ENABLED	P3MDITempProxy	#0	MaxTemperature
128	ENABLED	P3MDITempProxy	#0	MinTemperature
131	ENABLED	P3VacTempProxy	#0	Temperature
132	ENABLED	P3VacTempProxy	#0	Name
133	ENABLED	P3VacTempProxy	#0	MinTemperature
134	ENABLED	P3VacTempProxy	#0	MaxTemperature
141	ENABLED	Cms.PsGroup	EwMain	Status
142	ENABLED	Cms.PsGroup	EwCorr	Status
143	ENABLED	Cms.PsGroup	EwMain	StatusRegs
144	ENABLED	Cms.PsGroup	EwCorr	StatusRegs
157	ENABLED	MpsAlarms	Alarme	CurDC_Mp5y_Avg...
158	ENABLED	MpsAlarms	Alarme	CurDC_Mp5y_Avg...
159	ENABLED	MpsAlarms	Alarme	CurDC_Mp5y_Max
160	ENABLED	MpsAlarms	Alarme	CurDC_Mp5y_Min
169	ENABLED	HASYLAB/Petra3_P09vil.CDI.SRV	#0	TEMP_ALARM_OU...
176	ENABLED	HASYLAB/Petra3_P07vil.CDI.SRV	#0	TEMP_OUT.NAM
178	ENABLED	HASYLAB/Petra3_P07vil.CDI.SRV	#0	TEMP_ALARM_OU...
180	ENABLED	HASYLAB/Petra3_P07vil.CDI.SRV	#0	DURCHFLUSS_OU...
190	ENABLED	HASYLAB/Petra3_P10vil.CDI.SRV	#0	DURCHFLUSS_OU...

The configuration panel for Index 119 shows the following settings:

- Data Collection Configuration:**
 - Context: PETRA
 - Server: P3MagTempProxy
 - Device: #0
 - Property: Temperature
 - Format: FLOAT
 - Array Size: 1000
 - Input Format: NULL
 - Data Input: (empty)
 - Filtering of Data Storage: NEVER, ONCE, ALWAYS, FAST, SLOW, FIXTIME, HRT, STATUS, VOLATILE, NOPOI, BEAM, RUNNING
 - Access Rate: 1000 ms
 - Archive Heartbeat: 900 sec
- Property Viewing Configuration:**
 - Temps.Magnets,FLOAT,1000,C,70.0,-10.0,0.1,0.0,LIN,1.0,0.0,,,Diagnostics
 - Maximum size [bytes]: 4000
 - Remaining elements: 0
 - Keyword: Temps.Magnets
 - Data Format: FLOAT
 - Size: 1000
 - Units: C
 - Max: 70.0
 - Min: -10.0
 - Abs. Tolerance: 0.1
 - Rel. Tolerance: 0.0
 - Plot Style: LIN
 - Offset: 0.0
 - Scale: 1.0
 - Description: (empty)
 - Subsystem: Diagnostics
 - Associate: (empty)
 - Min: (empty)
 - Max: (empty)
 - Units: (empty)
 - Bind To: (empty)
 - Spectrum Axis: (empty)

Archive Database Manager

- Some targets need to be split into multiple keywords!
- Each can have its own tolerance and settings ...

The screenshot displays the Archive Database Manager interface for the PETRA database. The main window is divided into several sections:

- Database Entries:** A table listing various database records with columns for Index, Active status, Device Server, Device Name, and Device Property. The table contains 28 entries, with the last one (Index 1278) selected.
- Property Viewing Configuration:** Two panels on the right show the configuration for the selected entry (Index: 1278). The top panel shows the configuration for the keyword 'Undulator.Gap.Test', and the bottom panel shows the configuration for 'Undulator.Gap'. Both panels include fields for Data Format, Size, Units, Max, Min, Abs. Tolerance, Rel. Tolerance, Plot Style, Offset, and Scale. The 'BEAM' checkbox is checked in the 'Filtering of Data Storage' section.
- Filtering of Data Storage:** A section with checkboxes for NEVER, ONCE, ALW, SLOW, FIXTIME, HRT, VOLATILE, NOPOI, BEAM, and RUNNING. The 'BEAM' checkbox is checked, and a red arrow points to it.
- Buttons:** At the bottom of the interface are buttons for 'Reload DB', 'Write DB', 'Unlock DB', and 'DB locked by DUVAL'.

Archive Database Manager

- What is the ***Volatile*** filter ?
 - Not really a filter. It's a flag.
 - Signal that a MCA keyword is
 - also associated with defunct entries with different channel names sequence ... OR
 - the live entry can suddenly have a different channel names sequence
 - e.g. someone just has to insert a new temperature sensor in the middle (or remove one).
- Best practice:
 - Instruct the ADBM to acquire more elements from an MCA property than are currently registered
 - The stored record is longer than it needs to be but there is some buffer room
 - Some servers unfortunately return 'dimension error' when you do this ...
 - Add new devices/channels at the end of the array (then you won't need the ***Volatile*** flag)
- Is there a ***Volatile*** penalty?
 - Yes! The archive server has to do a lot more scanning of the data sets when this flag is set.
 - But ... the Archive Viewer user might not notice ...

Archive Database Manager

- Please use the 'help' when you have 'how to' questions ...