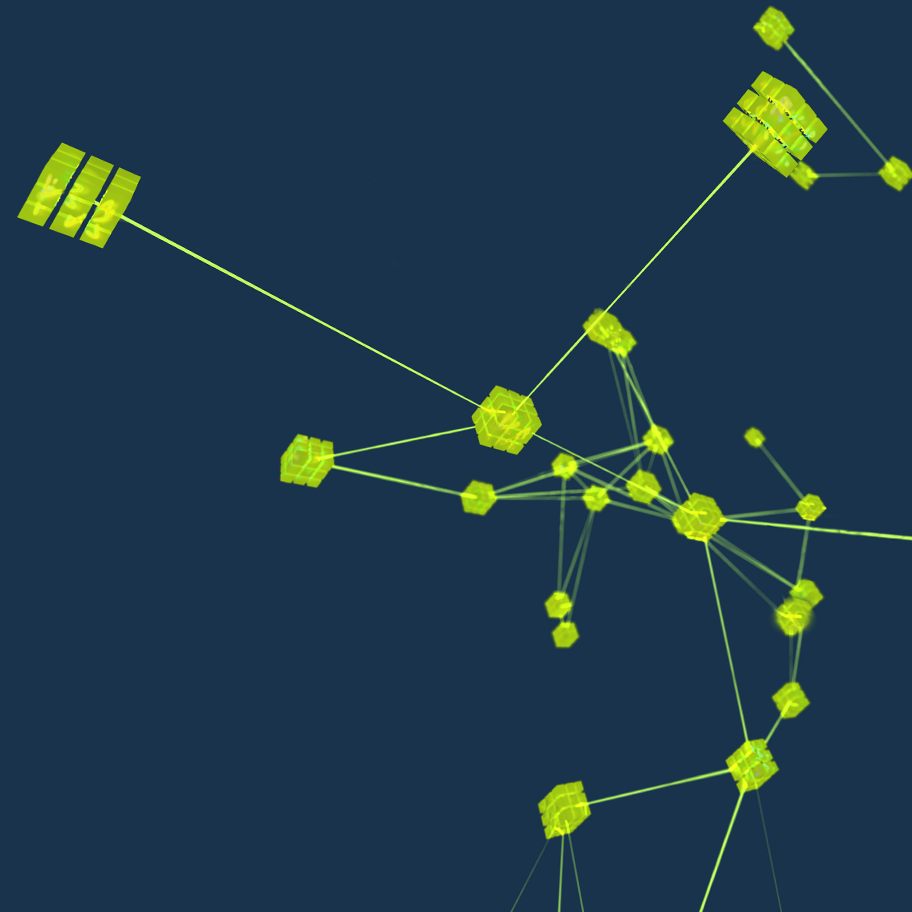


ArchiverAppliance



Features

- Ability to cluster appliances and to scale by adding appliances to the cluster.
- Multiple stages and an inbuilt process to move data between the stages.
- Focus on data retrieval performance.
- Focus on zero oversight.
- Supports Channel Access (ca://) and pvAccess (pva://).

- Developed by Murali Shankar at SLAC
- Documentation: <https://github.com/slacmshankar/epicsarchiverap>.
- A recent version of Linux, definitely 64 bit Linux for production systems.
- Sun Java JDK 1.8 - definitely the 64 bit version for production systems.
- A recent version of Tomcat 7.x.
- The management UI works best with a version of Firefox or Chrome.
- By default, the EPICS archiver appliance uses a bundled version of CAJ and EPICS_V4_PV.java.

Usage

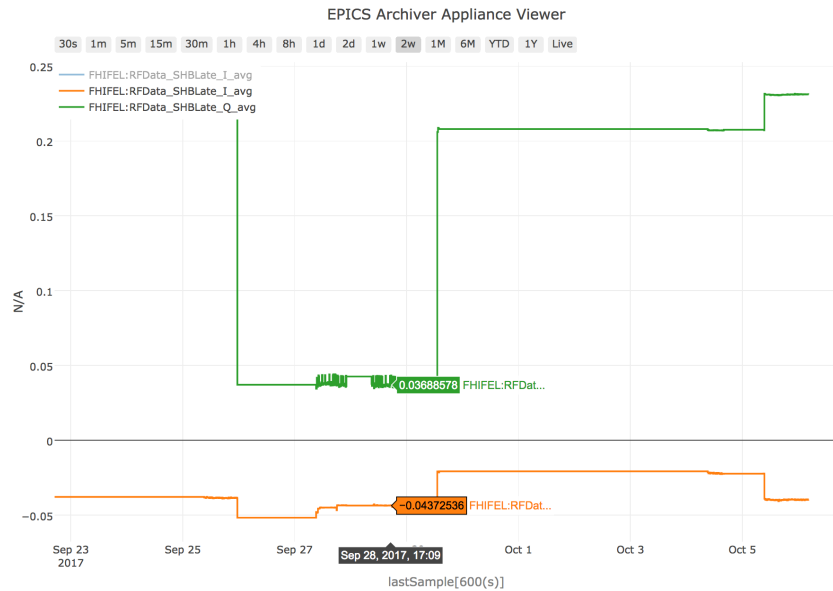
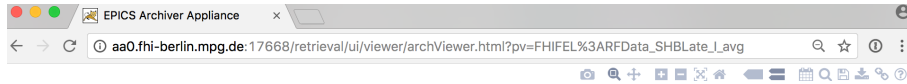
- Can be used as a replacement for channel archiver.
- Can import ChannelArchiver XML configuration files from existing ChannelArchiverInstallations.
- Can be customized.
- To retrieve data CS-Studio, Archive Viewer, Matlab can be used.
- Supports data retrieve in some other formats like JSON, CSV, TXT, etc.

This is the EPICS archiver appliance management console for FHI including the FEL facility. Please contact Heinz Junkes at 4270 if you have any issues. To check the status of or to archive some PV's, please type in some PV names here.

Check Status Archive Archive (specify sampling period) Lookup Pause Resume

25 Page 1 of 1

PV Name	Status	Appliance	Connected?	Monitored?	Sampling period	Last event	Details	Quick chart
FHIFEL:RFData_SHBLate_I_avg	Being archived	archappl1	true	true	1.0	Oct/06/2017 04:26:27 +02:00		
FHIFEL:RFData_SHBLate_Q_avg	Being archived	archappl1	true	true	1.0	Oct/06/2017 04:26:27 +02:00		
FHIFEL:RFData_SHB_I_avg	Being archived	archappl1	true	true	0.10000000149011612	Oct/06/2017 04:26:27 +02:00		
FHIFEL:RFData_SHB_Q_avg	Being archived	archappl1	true	true	0.10000000149011612	Oct/06/2017 04:26:27 +02:00		



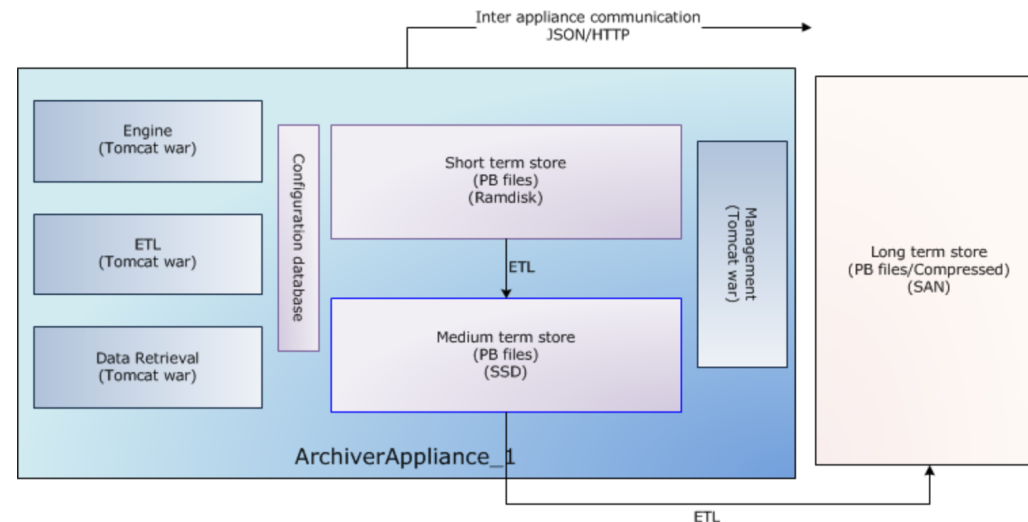
ARCHIVER APPLIANCE USAGE

Here are the complete details of the PV FHIFEL:RFData_SHB_I_avg.

Attribute	Detail
PV Name	FHIFEL:RFData_SHB_I_avg
Instance archiving PV	archappl1
Archival params creation time:	Jan/25/2017 12:11:51 +01:00
Archival params modification time:	Jun/22/2017 17:55:09 +02:00
Archiver DBR type (from typeinfo):	DBR_SCALAR_DOUBLE
Is this a scalar:	Yes
Number of elements:	1
Precision:	0.0
Units:	
Is this PV paused:	No
Is engine currently archiving this?	yes
Archiver DBR type (from CA)	DBR_SCALAR_DOUBLE
Number of elements per event (from CA)	1
Is engine using monitors?	yes
What's the engine's sampling period?	0.10000000149011612
Is this PV currently connected?	yes
Connection state at last connection changed event	Not connected
When did we receive the last event?	Oct/06/2017 04:26:27 +02:00
What did we last push the data to the short term store?	Oct/06/2017 04:26:36 +02:00
When did we request CA to make a connection to this PV?	Jul/21/2017 09:18:49 +02:00
When did we first establish a connection to this PV?	Jul/21/2017 09:18:49 +02:00
When did we last lose and reestablish a connection to this PV?	Sep/28/2017 12:55:57 +02:00
When did we last lose a connection to this PV?	Never
How many times have we lost and regained the connection to this PV?	4
How many events so far?	1209488
How many events lost because the timestamp is in the far future or past so far?	0
Timestamp of last event from the IOC - correct or not.	Oct/06/2017 04:26:59 +02:00

Storage

- Multiple stages and an inbuilt process to move data between the stages.
- This supports the ability to use faster storage (which is perhaps limited in size) to improve performance.
- Ability to reduce (decimate) the data as it moves into a store



Storage configuration example

- Ramdisk for the short term store - in this storage stage, we'd store data at a granularity of an hour.
- SSD/SAS drives for the medium term store - in this storage stage, we'd store data at a granularity of a day.
- A NAS/SAN for the long term store - in this storage stage, we'd store data at a granularity of a year.

tmpfs	64G	85M	64G	1%	/mnt/ramdisk
/dev/sdb	366G	27G	321G	8%	/db
nap34.rz-berlin.mpg.de:/aa/1	973G	582G	392G	60%	/sb0.aa1

Storage format

/sb0.aa1/FHIFEL/RFData_SHB_Q_avg:2017_01.pb
/sb0.aa1/FHIFEL/RFData_SHB_Q_avg:2017_02.pb
/sb0.aa1/FHIFEL/RFData_SHB_Q_avg:2017_03.pb
/sb0.aa1/FHIFEL/RFData_SHB_Q_avg:2017_05.pb
/sb0.aa1/FHIFEL/RFData_SHB_Q_avg:2017_06.pb
/sb0.aa1/FHIFEL/RFData_SHB_Q_avg:2017_07.pb
/sb0.aa1/FHIFEL/RFData_SHB_Q_avg:2017_08.pb
/sb0.aa1/FHIFEL/RFData_SHB_Q_avg:2017_09.pb

- Out of the box, PlainPBStoragePlugin is supported.
 - This plugin serializes samples using Google's Protocollbuffer and stores data in chunks.
 - Each chunk has a well defined key and stores data for one PV for a well defined time duration (for example, a month).
 - Using Java NIO2, each chunk can be stored as a file per PV per time partition.

/db/a/FHIFEL/RFData_SHBLate_I_avg:2017_10_04.pb /db/a/FHIFEL/RFData_SHBLate_Q_avg:2017_10_04.pb
/db/a/FHIFEL/RFData_SHBLate_I_avg:2017_10_05.pb /db/a/FHIFEL/RFData_SHBLate_Q_avg:2017_10_05.pb
/db/a/FHIFEL/RFData_SHBLate_I_avg:2017_10_06.pb /db/a/FHIFEL/RFData_SHBLate_Q_avg:2017_10_06.pb

Scripting

- The archiver appliance comes with a web interface that has support for various business processes.
- The web interface communicates with the server principally using JSON/HTTP.
- The same web service calls are also available for use from external scripting tools like Python or Perl.

```
#!/usr/bin/perl  
use LWP::Simple;  
  
$data=&get("http://aa0.rz-berlin.mpg.de:17665/mgmt/bpl/getAllPVs");  
  
print "$data\n";
```

pva:// support

- NTScalar and NTScalarArray will be stored as their V3 equivalents (ScalarDouble, ScalarInt, etc.).
- All other types gets stored as a generic "bunch of bytes" with all the fields. (still detailed tests necessary)
- It does not store customised PV structures.
- For more details on the mapping, please see https://github.com/slacmshankar/epicsarchiverap/blob/master/src/main/org/epics/archiverappliance/engine/pv/EPICS_V4_PV.java#L616

Need help for more tests

- Own tests can be carried out very easily.
- quickstart system is provided.
- Known “tests to do” can be found on the archAppl-webpage.
e.g. when a V4 PV changes type: <https://github.com/slacmshankar/epicsarchiverap/issues/37>

How to test

- start an example out of exampleCPP e.g. arrayPerformance

```
[h1@earth arrayPerformance (master *)]$ bin/linux-x86_64/arrayPerformanceMain
arrayPerformance 1000 0.5 1 2
2017-10-07T07:26:33.920 Using dynamically assigned TCP port 53660.
epicsSocketEnablePortUseForDatagramFanout: set SO_REUSEPORT
epicsSocketEnablePortUseForDatagramFanout: set SO_REUSEPORT
arrayPerformance value 1 time 1.00055 Iterations/sec 0.999452 Elements/sec 999.4
52
arrayPerformance value 3 time 1.00065 Iterations/sec 1.99871 Elements/sec 1998.7
1
arrayPerformance value 5 time 1.0006 Iterations/sec 1.99881 Elements/sec 1998.81
```

How to test

- archApp snapshot e.g. ftp://ftp.slac.stanford.edu/users/mshankar/archappl_v0.0.1_SNAPSHOT_27-September-2017T15-20-36.tar.gz
- java 8 JDK must be installed
- apache-tomcat-7.0.8x.tar.gz

```
archiver@earth:~/archAppliance$ ls
Apache_2.0_license.txt    appliances.xml  etl.war        LICENSE        NOTICE        RELEASE_NOTES  sample_site_specific_content
apache-tomcat-7.0.81.tar.gz  engine.war    install_scripts  mgmt.war      quickstart.sh  retrieval.war
archiver@earth:~/archAppliance$ ./quickstart.sh apache-tomcat-7.0.81.tar.gz
SRCDIR=/home/archiver/archAppliance
DATADIR=/home/archiver/archAppliance
Using org.epics.archiverappliance.config.persistence.InMemoryPersistence as the persistence layer
/home/archiver/archAppliance/quickstart_tomcat
total 4
figService - RETRIEVAL connecting as a native client to 127.0.0.1:16670
30410 [http-bio-17665-exec-2] INFO  config.org.epics.archiverappliance.config.DefaultCon
figService - Start complete for webapp RETRIEVAL
35294 [http-bio-17665-exec-1] INFO  config.org.epics.archiverappliance.mgmt.MgmtRuntimeS
tate - All components in this appliance have started up. We should be ready to start ac
cepting UI requests
```

How to test

This is the archiver appliance management console for the LCLS archiver. Please contact Jingchen Zhou for any questions regarding these archiver appliances. For support, please contact Murali Shankar at 650 xxx xxxx or Bob Hall at 650 xxx xxxx.

To check the status of or to archive some PV's, please type in some PV names here.

`pva:arrayPerformance`

Check Status Archive Archive (specify sampling period) Lookup Pause Resume

25 Page 1 of 1

PV Name	Status	Appliance	Connected?	Monitored?	Sampling period	Last event	Details	Quick chart
pva:arrayPerformance	Not being archived	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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`pva:arrayPerformance`

Check Status Archive Archive (specify sampling period) Lookup Pause Resume

25 Page 1 of 1

PV Name	Status	Appliance	Connected?	Monitored?	Sampling period	Last event	Details	Quick chart
pva:arrayPerformance	Initial sampling	N/A	N/A	N/A	N/A	N/A		N/A

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`pva://arrayPerformance`

Check Status Archive Archive (specify sampling period) Lookup Pause Resume

25 Page 1 of 1

PV Name	Status	Appliance	Connected?	Monitored?	Sampling period	Last event	Details	Quick chart
pva://arrayPerformance	Being archived	appliance0	true	true	1.0	Oct/07/2017 07:35:58 +02:00		

Thank You for Your Attention!

