

HDB++ Workshop

ALBA
DESY
Elettra
ESRF
MAX IV
SKAO
Soleil
Solaris

<your institute>



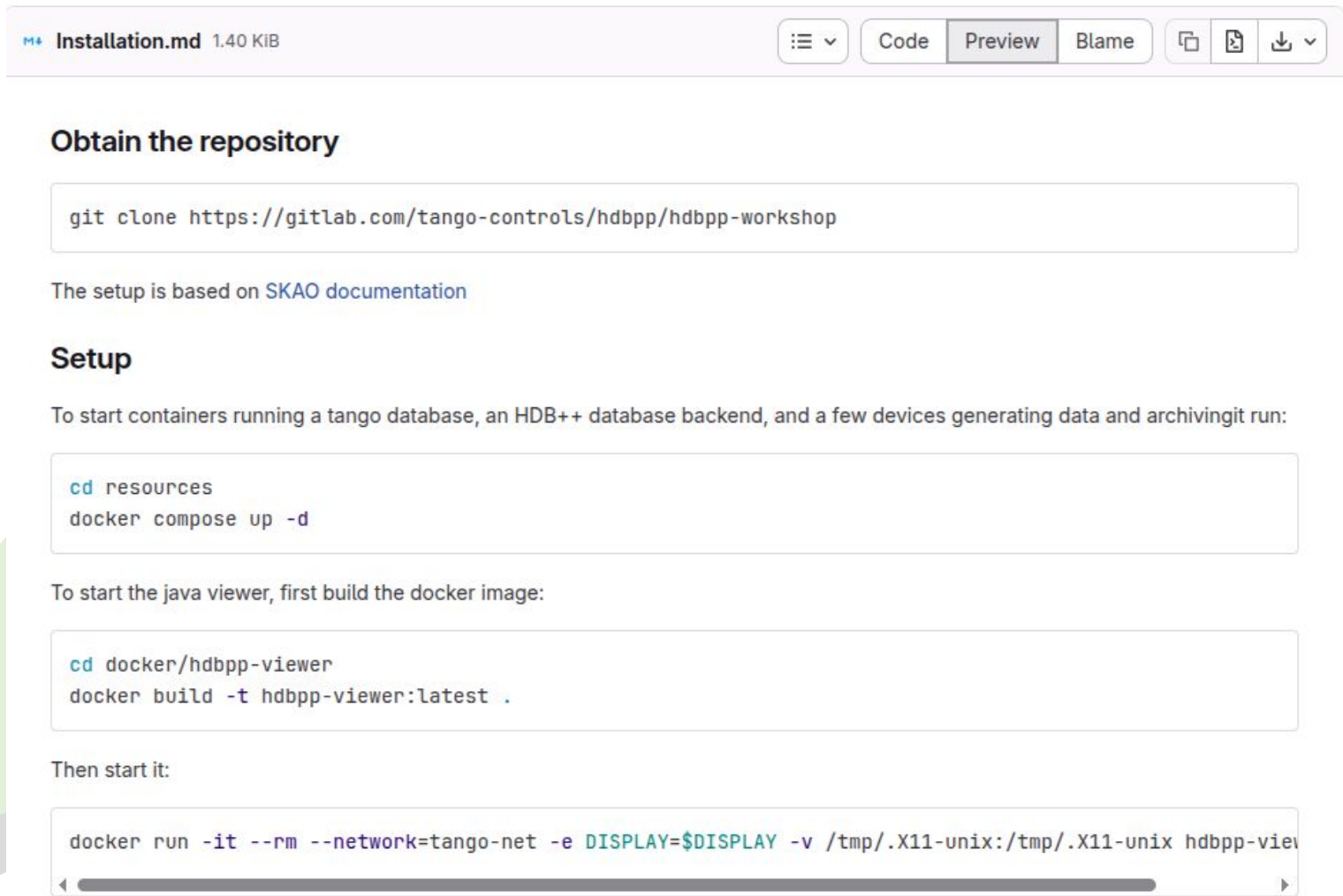
- **Welcome / Introduction**

- **Facility Status / Setups**
- **Ecosystem and Tools**
- **Live Demos**

<Lunch Break>

- **HDB++ Evolution and Roadmap discussion**

<https://gitlab.com/tango-controls/hdbpp/hdbpp-workshop/-/blob/master/Installation.md>



The screenshot shows the GitLab interface for the file `Installation.md` (1.40 KIB). The file is viewed in the `Code` tab. The content of the file is as follows:

```
M+ Installation.md 1.40 KIB
```

Obtain the repository

```
git clone https://gitlab.com/tango-controls/hdbpp/hdbpp-workshop
```

The setup is based on [SKAO documentation](#)

Setup

To start containers running a tango database, an HDB++ database backend, and a few devices generating data and archiving it run:

```
cd resources
docker compose up -d
```

To start the java viewer, first build the docker image:

```
cd docker/hdbpp-viewer
docker build -t hdbpp-viewer:latest .
```

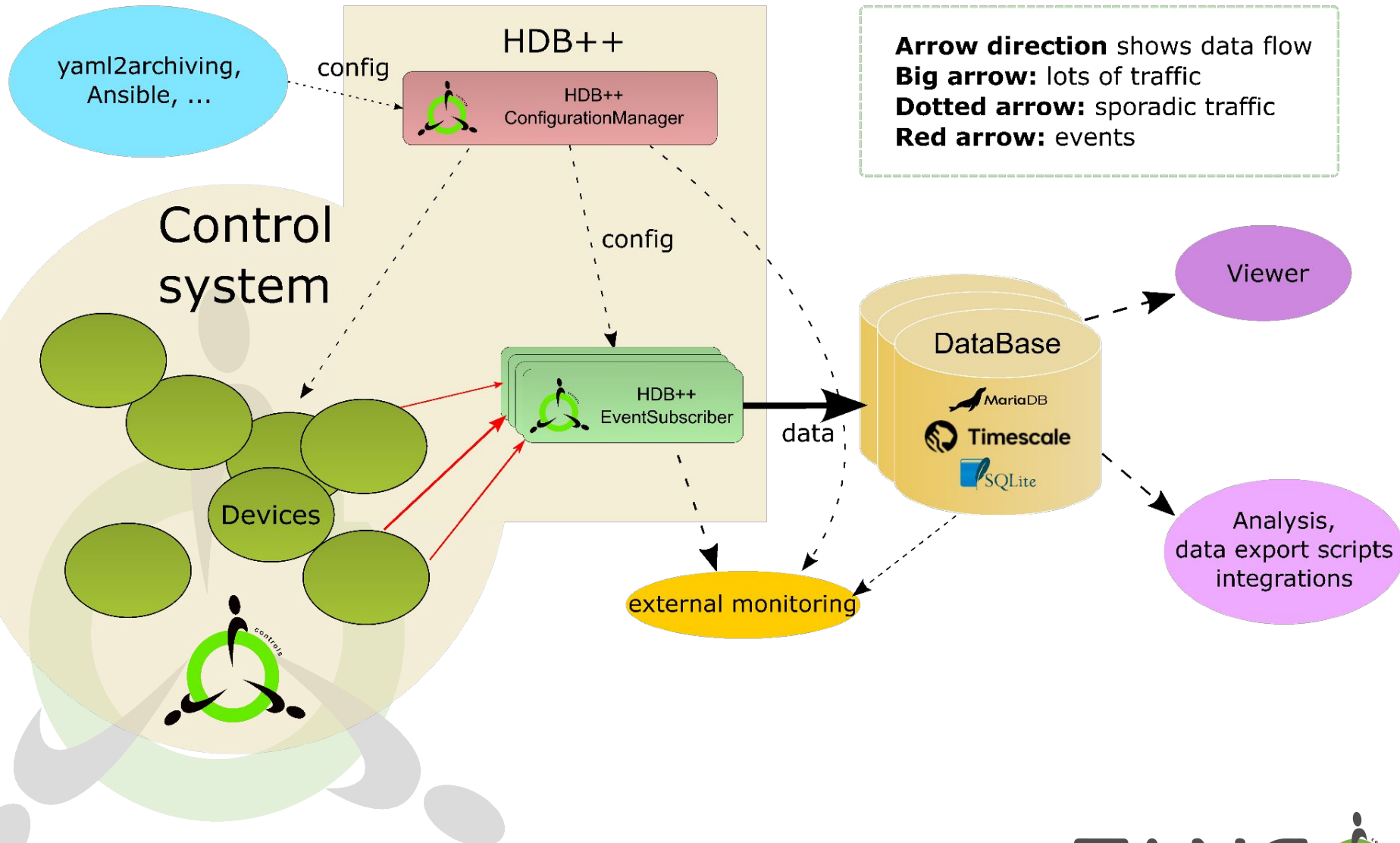
Then start it:

```
docker run -it --rm --network=tango-net -e DISPLAY=${DISPLAY} -v /tmp/.X11-unix:/tmp/.X11-unix hdbpp-viewer
```

Take the mic and share your screen by Zoom! (<https://rediris.zoom.us/j/3230192144>)

- Welcome Talk (S.Rubio)
- HDB++ Intro : Installation overview using docker (D.Lacoste)
- HDB++ Status at ALBA (S.Rubio)
- HDB++ Status at ESRF (D.Lacoste)
- HDB++ Status at Max IV (D.Egorov)
- HDB++ Status at SKA (T.J / M.Z.)
- HDB++ Status at Solaris (M.Falowski)
- Tools : HDB++ Developments (M.Zambrano)
- Tasks : Updating the benchmarks spreadsheet, the golden rules (e.g. Max Partition < 30% RAM)
- Tools : The HDB++ Benchmarck (G.Scalamera)
- Java Tools : hdbppconfigurator / hdbppviewer
- Non-java Tools : yaml2archive / archviewer (D.Egorov)
- Tools : Grafana + plugin connector (J.Ramos)
- Tools : pyhdbpp + rest-api (SKA?)
- Tools : Grafana + direct query + aliases handling at MaxIV (D.Egorov)
- Tools : python configurator ? PyTangoArchiving vs pyhdbpp.manager vs pyhdbts
- Tools : New YATES Event Subscriber (A.Ollé)

HDB++ High-performance event-based Archiving System for Tango



<https://tango-controls.readthedocs.io/en/latest/Reference/hdbpp/hdb%2B%2B-design-guidelines.html#id2>

HDB++ Design and implementation

Author: *Lorenzo Pivetta*

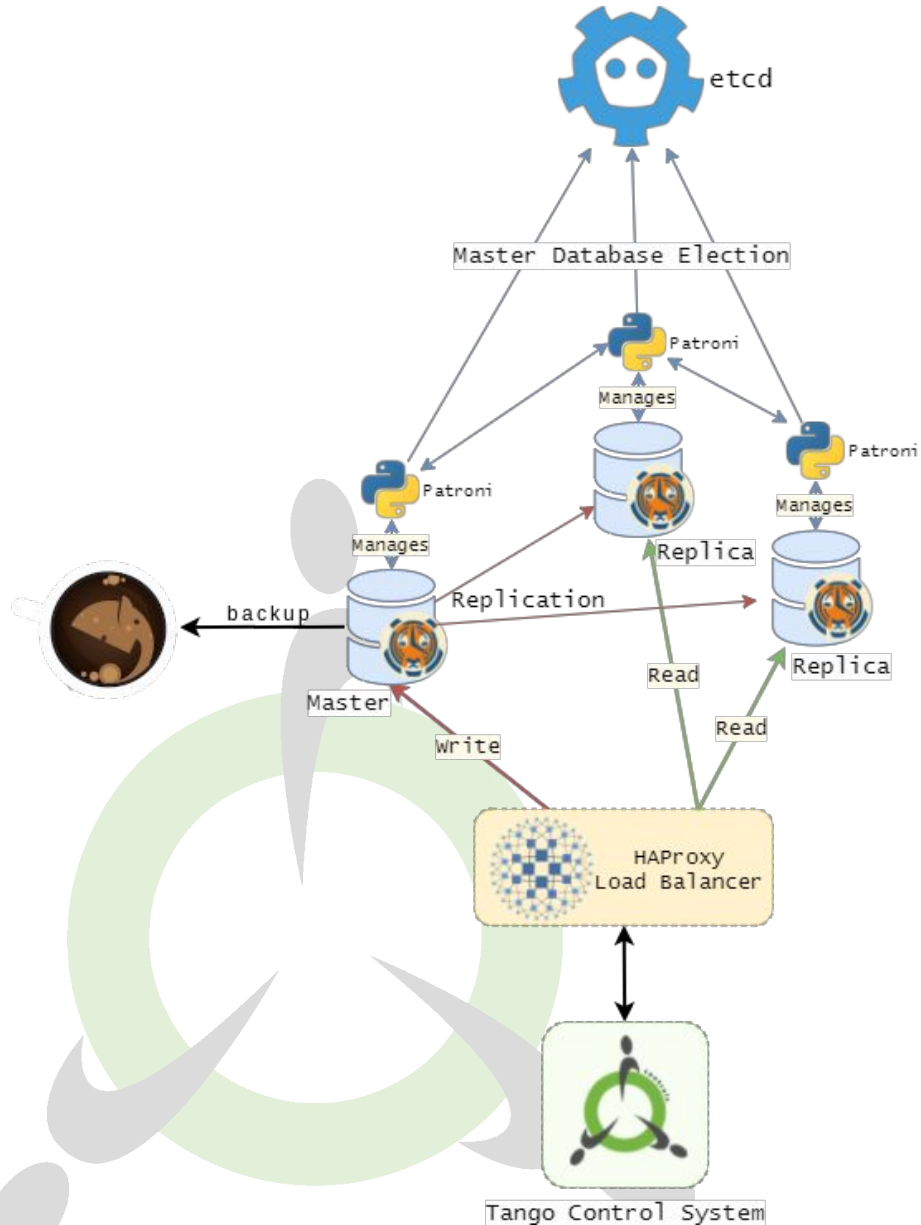
Below, details on deployment and configuration of the **HDB++** service are provided. For overview, see [HDB++](#) of [Tools](#) section.

Contents

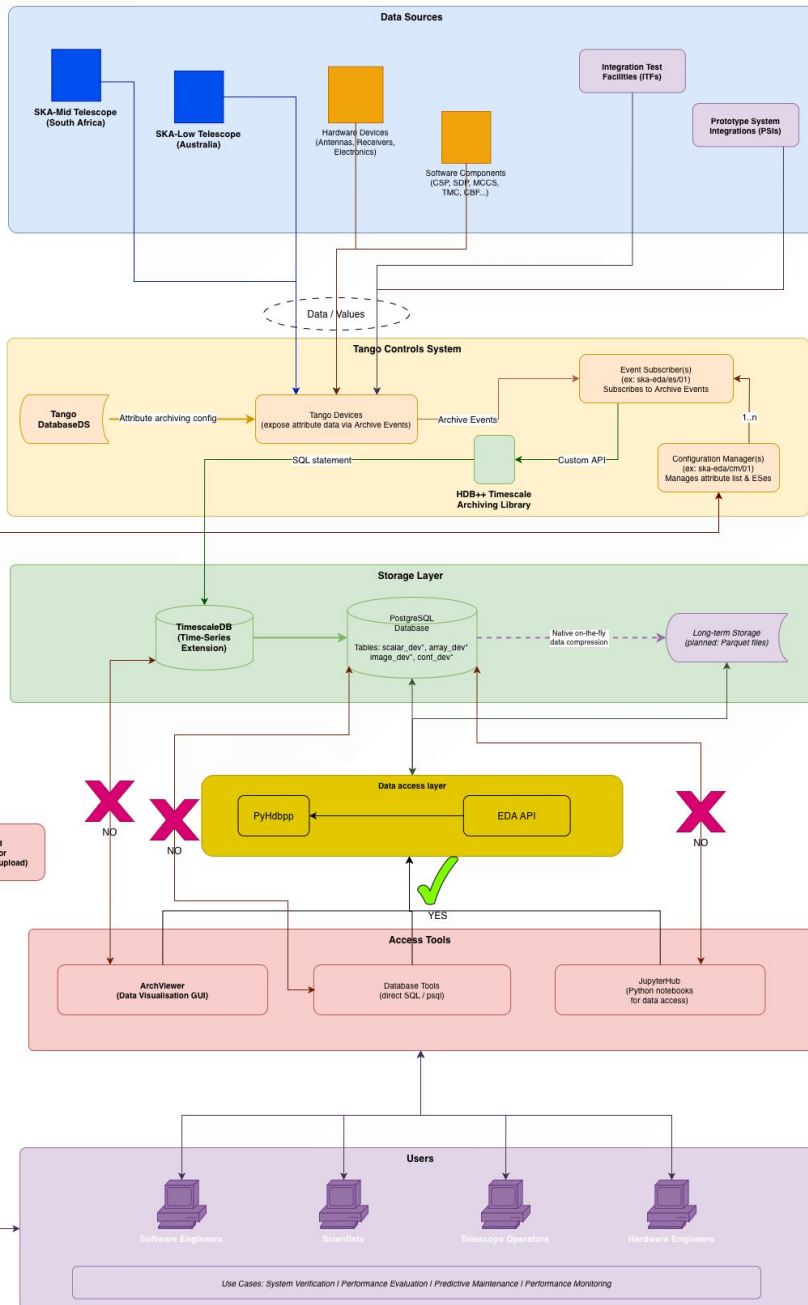
[HDB++ Design and implementation](#)

- [HDB++ Contributions](#)
- [Historical Database](#)
- [HDB++ TANGO Device Server](#)
- [Configuration and diagnostic tools](#)
- [Database interface](#)
 - [database structure](#)
- [Deployment best practices](#)
- [General remarks](#)
- [Project references and source code](#)
- [Event Subscriber full documentation](#)
- [Configuration Manager full documentation](#)

ESRF setup [TimescaleDB, bare-metal]



- 1 database for all
- High availability cluster
- 3 nodes
- 14To SSD raid storage
- Extra dedicated 10GB link
- PITR backup with barman
- Data compressed after 1 year
- Use TTL
- Configuration via java GUIs
- Monitored via pgwatch



SKAO setup: Everything runs containerized on Kubernetes

Everything developed by the community is available at:

<https://gitlab.com/tango-controls/hdbpp>

Report issues on <https://gitlab.com/tango-controls/hdbpp/hdbpp-tickets>

tango-controls / hdbpp

This application is a GUI for ContextManager device server It is able to show context for all event subscribers It is also able to set the context pe...

H hdbpp-benchmark

H hdbpp-cm
Tango device server for the HDB++ Configuration Manager

H hdbpp-cm-es
Tango device server able to export HDB++ Configuration Manager and HDB++ Event Subscriber devices.

H hdbpp-configurator
HDB++ Configurator GUI and java device server

H hdbpp-es
Tango device server for the HDB++ Event Subscriber.

H hdbpp-metrics
HDB++ metrics work

H hdbpp-mysql-project

H hdbpp-pyhdbppperiodicarchiver
Device server to insert periodic data into hdb++ databases - requires libhdbppinsert - ask ALBA developers for updates controls-software@cell...

H hdbpp-tickets
The official place to create an issue/ticket related to HDB++ when it impacts several repositories or you don't know where to create your issue.

H hdbpp-timescale-project
hdbpp-timescale-project

H hdbpp-viewer
Java HDB++ viewer

L libhdbpp
Interface library for HDB++.

Keeping track of our HDB++ deployments to facilitate comparison and architectural design for new facilities

(always in progress, please add your results [here](#))

Institute	ALBA	ESRF	SKAO MID-ITF	SKAO MID-PSI	SKAO LOW-ITF	SKAO AAVS3	ELETTRA	ELETTRA
Db Engine	MariaDB	TimescaleDB	TimescaleDB	TimescaleDB	TimescaleDB	TimescaleDB	MySQL/InnoDB	MySQL/InnoDB
Used for	vacuum	Generic	Generic	Generic	Generic	Generic	Fermi FEL	Elettra SR
mode	:change_events, inserts	events+periodic (periodic is discouraged)	events+periodic (periodic is discouraged)	+periodic (periodic is discouraged)	periodic is discouraged)	periodic is discouraged)	archive events	archive events
Hdb++ version	1.x	current	current	current	current	current	current	current
Packaging/distribution	debian package	compile-in-place	docker images	docker images	docker images	docker images	compile-in-place	compile-in-place
OS	Debian 9	ubuntu 20.04	Kubernetes	Kubernetes	Kubernetes	Kubernetes	Ubuntu 18.04	Ubuntu 18.04
RAM	128 Gb	128 Gb	Varies(32G)	Varies(2x128G)	Varies(32G)	Varies(2x128G)	32 Gb master/64 Gb replica	16 Gb master/64 Gb replica
N CPUs	24	64	Varies(16)	Varies(2x64)	Varies	Varies(2x128)	8 master/4 replica	8 master/4 replica
Db Size (Gb)	514	4200	1.8	0.4	77	5	350	332
Timespan	3 months	4 years	4 months	6 months	9 months	1 month	2 years	2 years
N attributes	5159	17772					17326	6067
N attributes pushing events	4505	all?					all	all
N scalar double attributes	3461	15006						
from N devices	806	6579	~10	~10	~10	~10		
N subscribers	16	84	1	1	1	1	59	19
partitioning	322.4375	211.5714286	0	0	0	0	293.6610169	319.3157895
max partition size	30 days	from couple of days for double to a month					2 months for double, 1 year c	2 months for double, 1 year oth
events/second (hdb++es)	64G	~64Gb					29 Gb	35 Gb
events/second (stored)	137.133	700	Not measured yet	Not measured yet	Not measured yet	Not measured yet	150	85
events/second/attribute (average)	0.03						0.008	0.014
events/second/subscriber (average)	8.5708125	8.33333333	#VALUE!	#VALUE!	#VALUE!	#VALUE!	2.542372881	4.473684211
max events/second/attribute	14.36						16.5	17
max events/second/subscriber	1						2.8	1.5
max events/second/attribute (stored)								
max events/second/device	452							
bytes/event	62018							
bytes/second								

<https://semestriel.framapad.org/p/hdbpp-meeting-20220518-9u9j>

Let's brainstorm and come up with a future roadmap for HDB++!

To help start the discussion we will have a list of items/bug fixes/enhancements/new features that we sometimes talked about. They are not ordered by matter of importance, but randomly. We do not have to put them all in a roadmap, but it is to help us have a view of the bigger picture.

Roadmap items

- Support for aliases attribute and/or device
- Support more backends (InfluxDB, parquet, files...)
- Have a full benchmarking suite to test regression and compare backends
- Archive tango properties into HDB++
- Merge snap functionality into HDB++
- Have a 'time machine' simplified retrieval of values in HDB++ to apply them in a control system
- Tighter integration with Tango Controls database (i.e. use HDB++ for memorized attributes and/or properties history)
- Decimation/aggregation/cold and fast storage management and strategies
- Web apps for configuration
- Unified extraction data format for archiving databases
- Support alarm events
- Support telemetry for archiving insertion
- Export Backend versions to clients using device info
- RIIR
- Contribution guidelines
- Group/Collaboration organization
- Package everything as deb
- CI/CD
- pyhdbpp development status
- insertion library development status