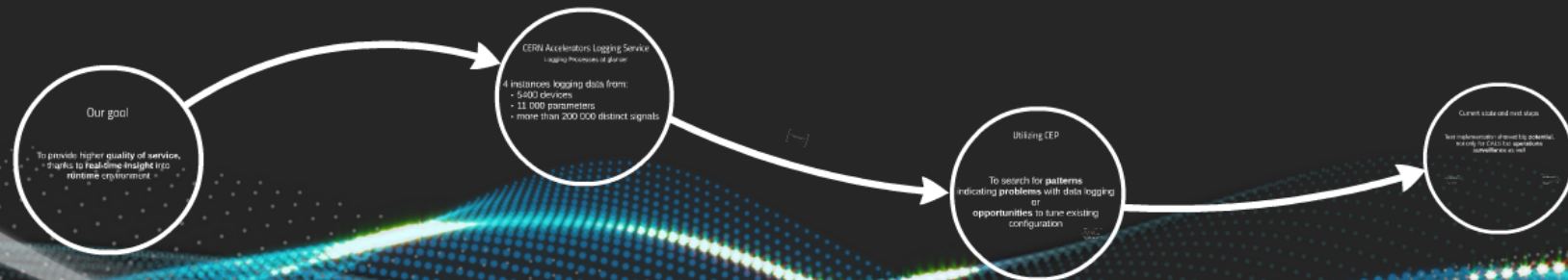
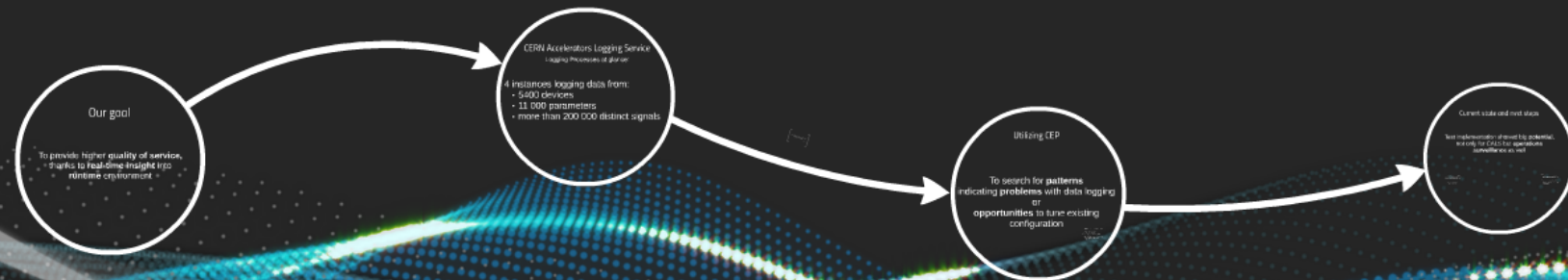


Surveillance of CERN Accelerators Logging Processes with CEP and ESPER



Surveillance of CERN Accelerators Logging Processes with CEP and ESPER



Our goal

To provide higher **quality of service**,
thanks to **real-time insight** into
runtime environment

quality of service,
time insight into
environment

to know in advance **if and where** problems exist, enabling
responsible to minimize data loss

advancing from reactive to **proactive** situation



CERN Accelerators Logging Service

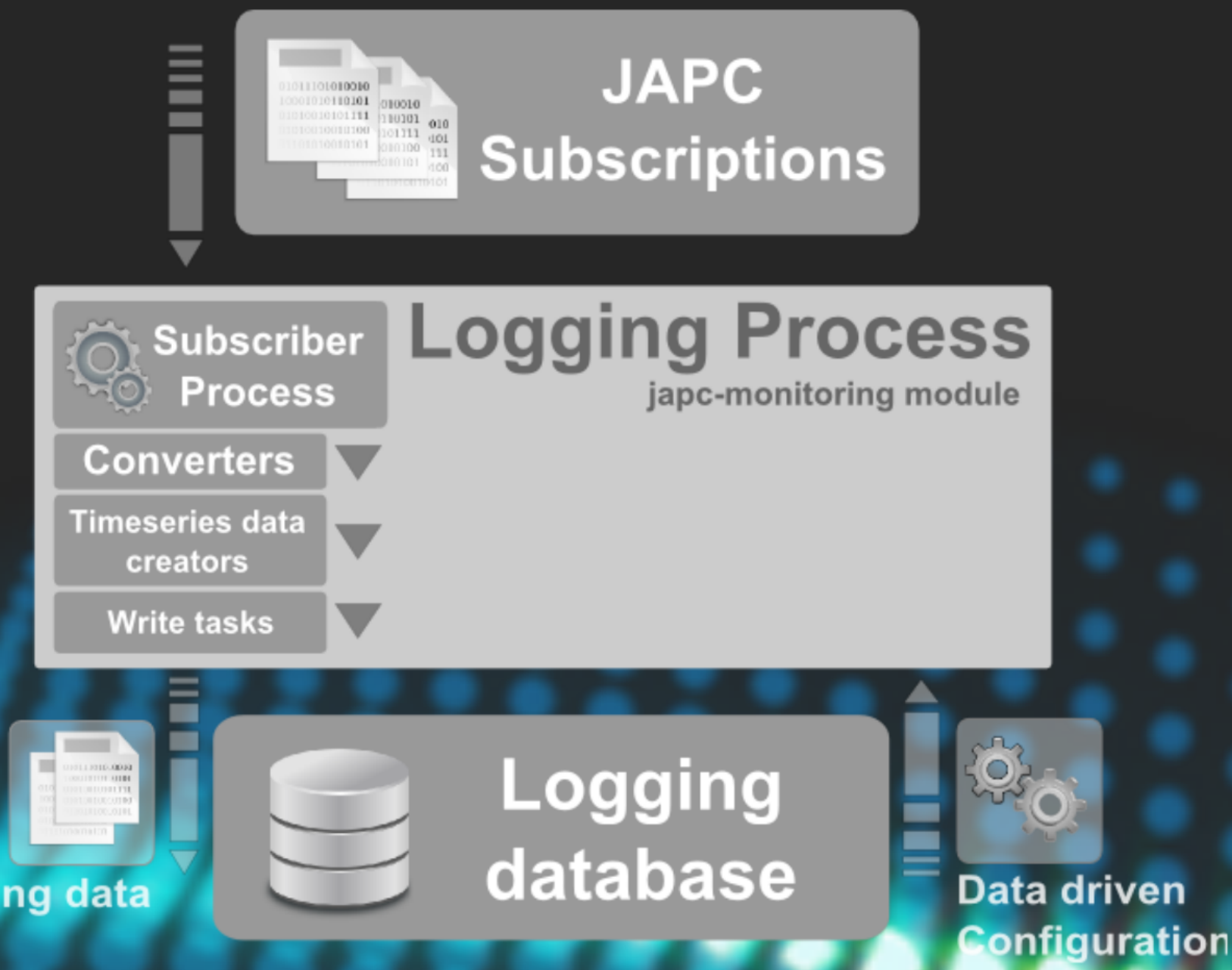
Logging Processes at glance:

4 instances logging data from:

- 5400 devices
- 11 000 parameters
- more than 200 000 distinct signals



CALS Logging Processes overview



"The causes of events are ever more interesting
than the events themselves"

Marcus Tullius Cicero

Utilizing CEP

To search for **patterns**
indicating **problems** with data logging
or
opportunities to tune existing
configuration

Esper engine in CALS processes

- fully data driven configuration
- dedicated, separate instances (RM)
- set of EPL queries focused on searching of:
 - process health related patterns
 - loggate values trends

patterns with data

parameter update rate is
below average

beam is STABLE but device
does not produce any data

parameter update rate
exceeded allowed threshold

device is accessible but data
are not being logged

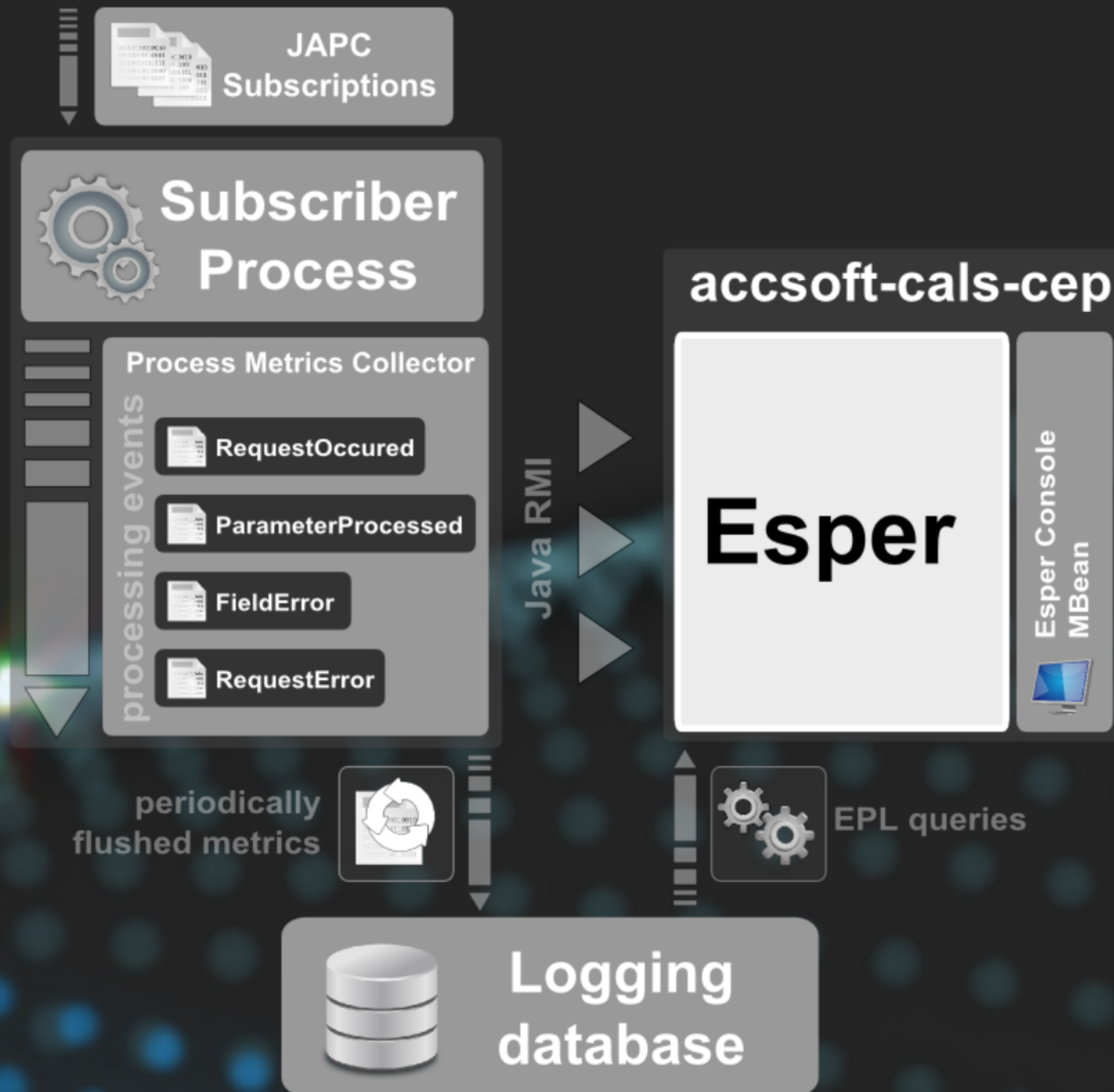
variance of a signal value
is below threshold

parameter error state
is fluctuating

Esper engine in CALS processes

- fully data driven configuration
- dedicated, separate instances (RMI)
- set of EPL queries focused on searching of:
 - process health related patterns
 - logged values trends

Logging Process



Current state and next steps

Test implementation showed big **potential**,
not only for CALS but **operations**
surveillance as well

Test phase also visibly showed potential
 dangers hidden behind complexity of program.
 Based on experts' processing and Espen study

problems encountered during test
 phase are being investigated

next steps

tests in similar environment, with full production
 load (tens of thousands of events / sec)

"commonware" like library, not specific for CALS

deployment into production and further analysis of
 interworking activities

Test phase also vividly showed potential dangers hidden behind complexity of analysis based on events processing and Esper itself

problems encountered during test phase are being investigated

next steps:

tests in sandbox environment, with full productional load (tens of thousands of events / sec)

"commons" like library, not specific for CALS

deployment into production and further analysis of interesting patterns

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