



**FUSION
FOR
ENERGY**

The EPICS Data Diode

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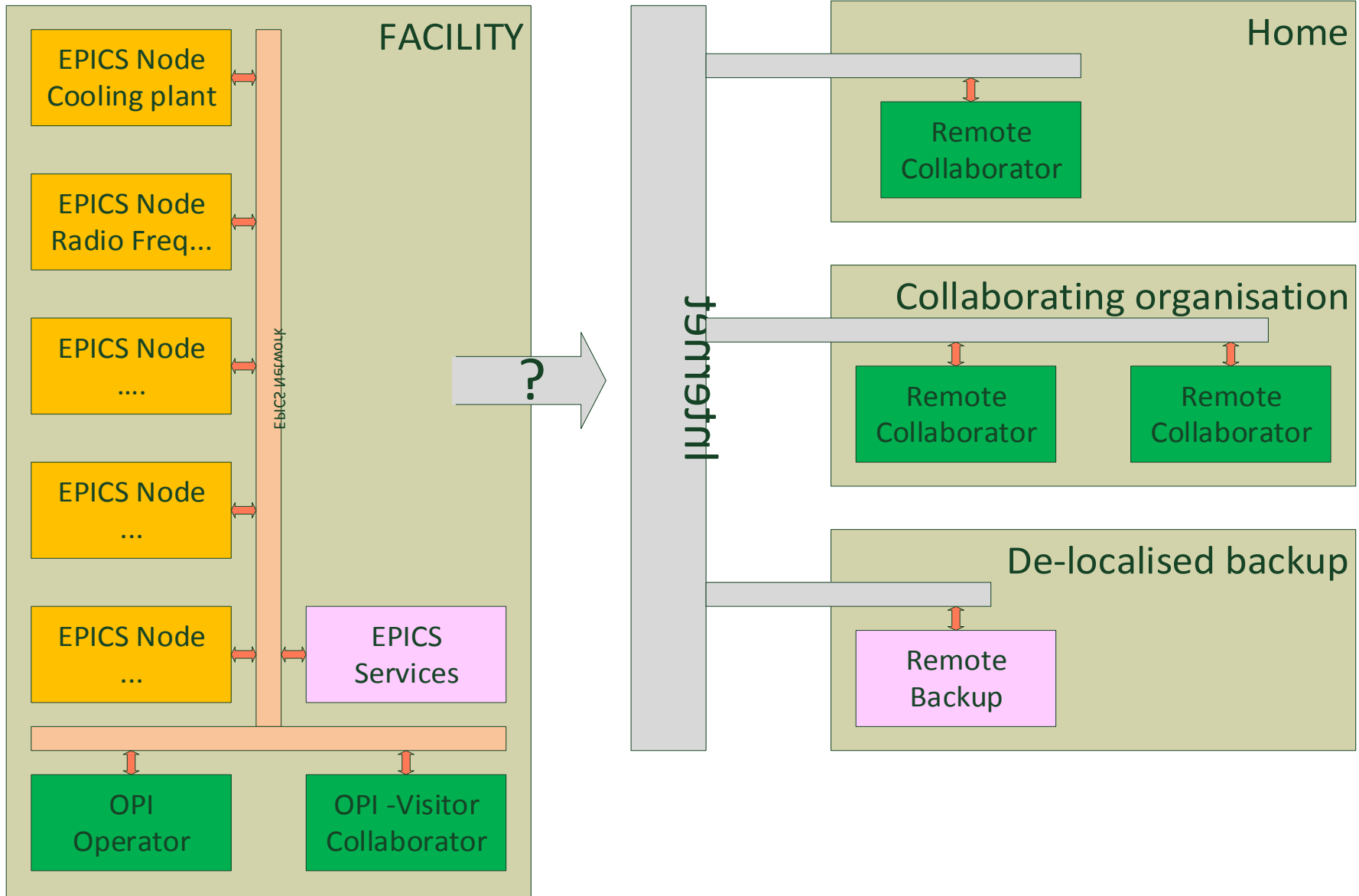
To minimize the risks in large experimental facilities, high level of coordination is needed.

Main coordination center = CONTROL ROOM

REQUIREMENTS:

- *Stringent rules for allowing external connections to the facility.*
- *Remote operation not allowed.*
- *To allow remote monitoring, traffic must be one-directional to the external server(s).*

Current State and needs



Objectives:

- A mean to send the data out efficiently

Implements:

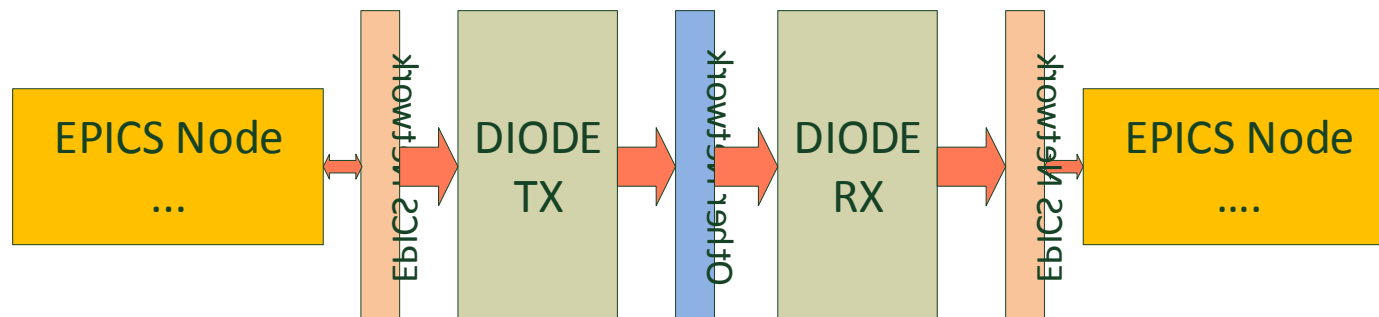
- One-way gateway between two networks via a third one (for instance internet)
- **Cannot be configured to let data in the opposite direction**

Requires:

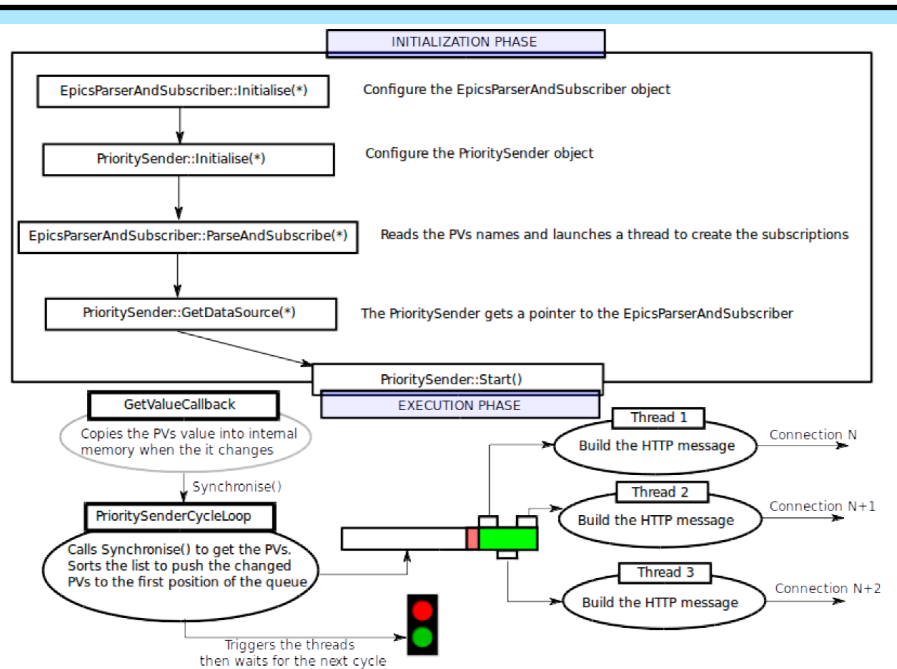
- Minimum network security compromise: only ability to connect to external server (like a Browser)

Currently uses HTTP so that we can go through proxies.

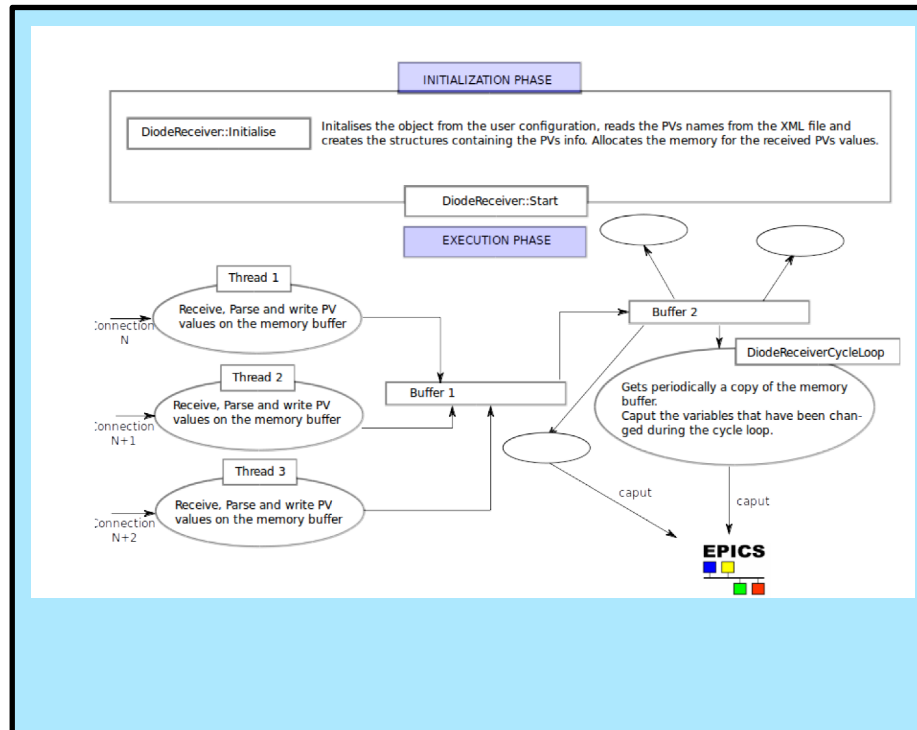
Multiple parallel connections to handle network latencies.



Diode Sender



Diode Receiver



- Configurable number of connections.
- Configurable send rate, the PVs changed during the period are sent first.
- Configurable caput rate on the receiver. The PV timestamp is preserved.

- The Diode provides an immediate and safe solution to monitor machine operations remotely.
- The use of the **MARTe2** lib for its implementation makes it easy to configure and adaptable for different use cases (push the PVs to serial, to reflective memory, etc.)
- It is suitable for long-distance communication as well as for local ones (i.e technical to office network).
- Currently it reads/writes to EPICS through the **channel access** and uses **softIOCs** to replicate the sender EPICS environment on the receiver.
- The first version is already being employed. Currently it is passing through the QA process, to find out what can be improved.