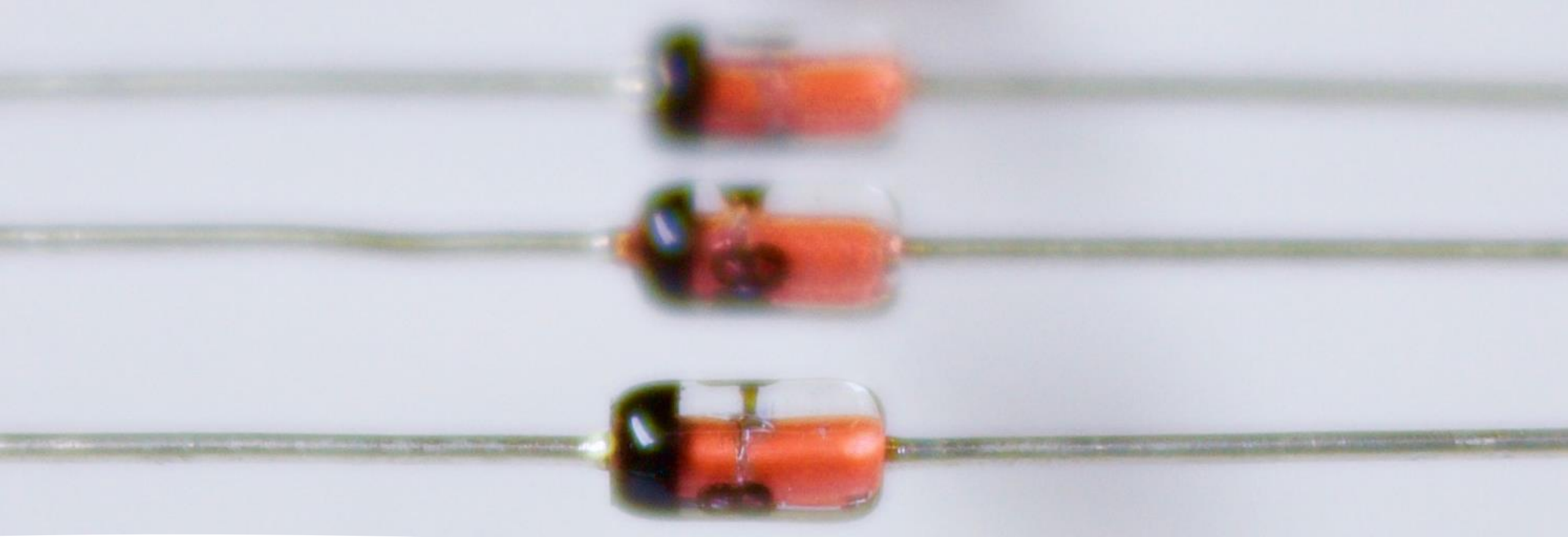


(Yet Another) EPICS Diode

One-Way Data for ITER Remote Participation

Ralph Lange, ITER Organization

EPICS Collaboration Meeting, 24-28 April 2023

iter

china eu india japan korea russia usa

Remote Participation – NOT Remote Control

ITER is a Nuclear Facility. There are strict access rules in place.

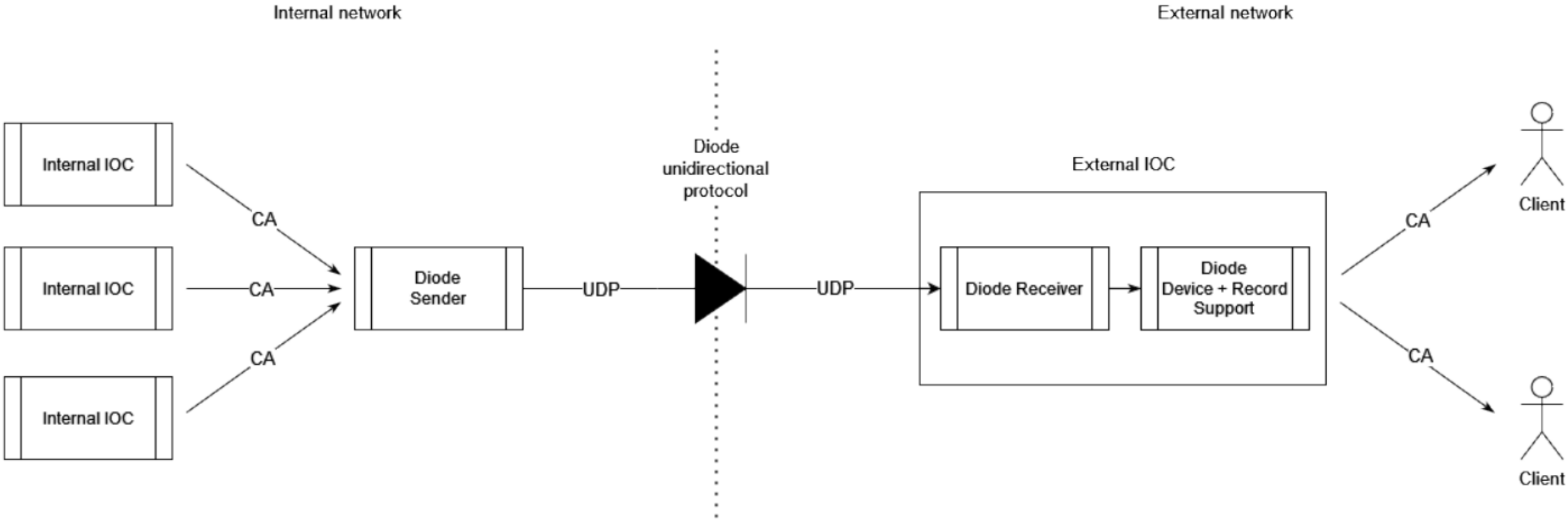
Requirements:

- Strict rules to limit external connections to the facility.
- No remote operation.
- Network traffic is enforced to be strictly one-directional from the inside to the outside.
  (E.g., using a commercial “network diode” box.)

F4E (Giuseppe Ferro et al.) developed an EPICS Data Diode (presented at the EPICS Collaboration Meeting in 2020).
Their implementation uses HTTP on the long distance.

ITER (Leonid Lobes) has tested CA working fine over long distance (presented at the EPICS Collaboration Meeting in 2022).
ITER decided to do another implementation, using a UDP stream across the diode, which meets the ‘strictly one-directional’ requirement.

> *Don’t reinvent the wheel, just realign it.*
>
> *Anthony D’Angelo*



Replicating an IOC Using a UDP Stream

Both sides (sender and receiver) are fully configured.
Sender has CA subscriptions and sends updates (value/time/status) through a mostly binary UDP streaming protocol.
Receiver pushes data into the EPICS Database and sends out CA updates.
This setup will be local, with CA being used across the long distance.

Status and Roadmap

- Requirements and Design Documents are approved.
- Our contractor (Cosylab) delivered a proof-of-concept implementation, using specialized Record and Device Support in the receiver IOC.
- The next version, using a “hollowed-out” receiver IOC and supporting all fields and record types, is expected in late summer 2023.
- There are no ITER specifics in this code. It will be made available to the EPICS collaboration.
- Stay tuned for future reports on this.

Credits

- Denis Stepanov, Leonid Lobes (ITER)
- Matej Sekoranja (Cosylab)

Thank you!