ITER Needs for EPICS & Web

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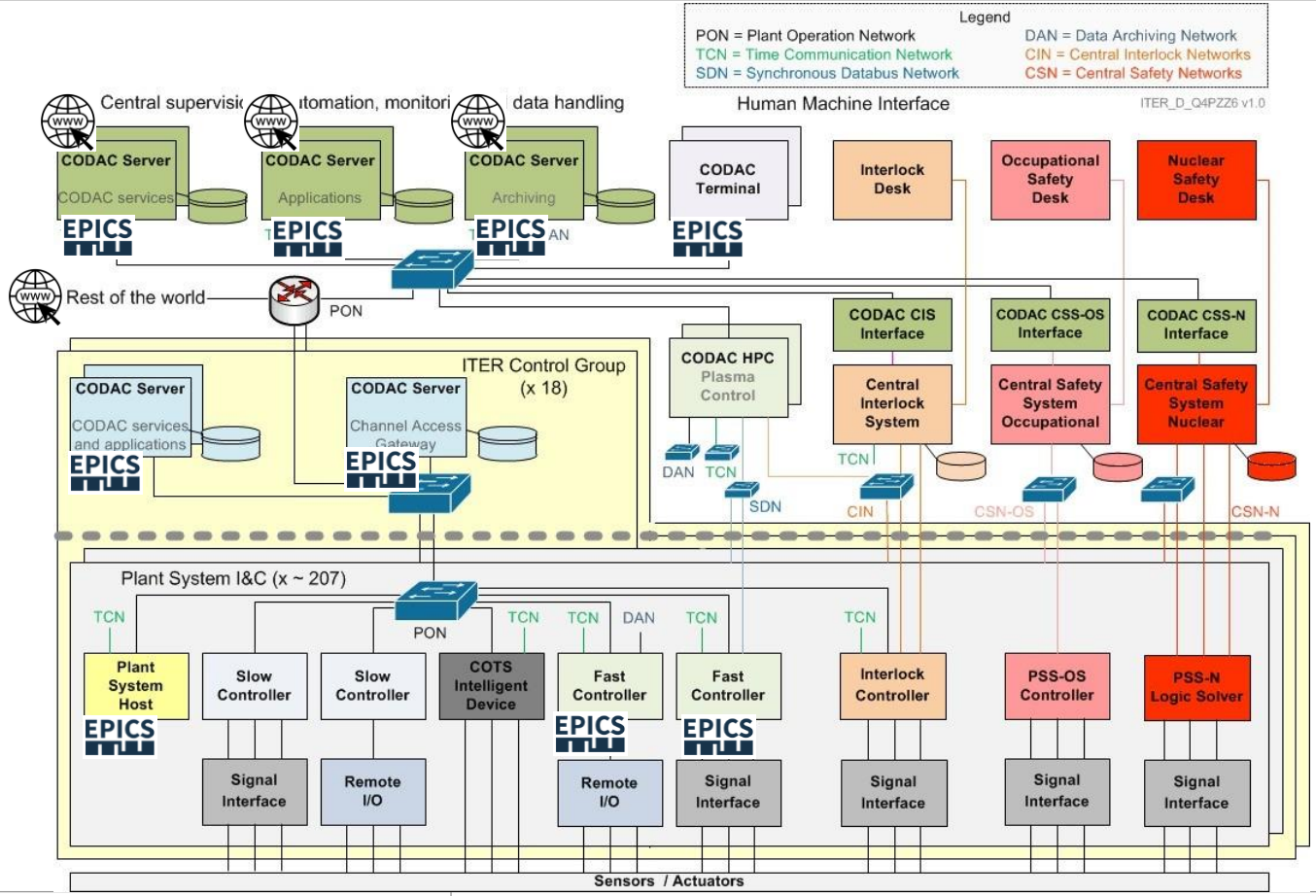
Disclaimer: The views and opinions expressed herein do not necessarily reflect those of the ITER Organization

Scope

- Web tools are nowadays ubiquitous and can be found in both development (configuration) and runtime environments
- This presentation is about run-time and “post-runtime” data presentation and dissemination, not about configuration tools

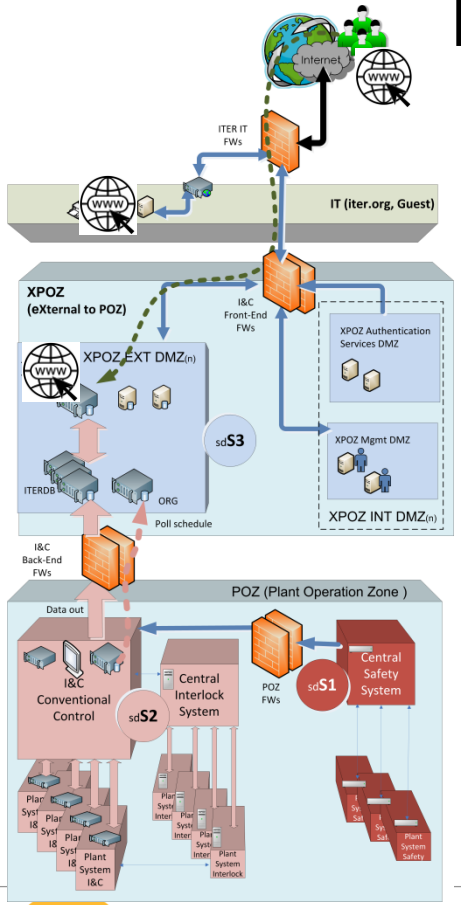
Place of EPICS & Web in Architecture



ITER Constraints

- Nuclear plant network segregation
- Role-based access
- Remote participation

Network Zoning & Security Degrees



IEC 62645 mapping:

- S1 – Safety systems (POZ)
- S2 – Conventional controls & interlocks (POZ)
- S3 – XPOZ
- Other – IT

Each zone may have multiple specialized networks. Networks can be structured in subnets.

Classes of Remote Users

- Off-site Research
  - Access to ITER internal resources (IDM, CAD, …)
  - Access to UDA
  - Access to Scientific Data Center
  - Access to experiment status data for non-operators
  - Limited access to live data
- Off-site Remote Participation Center
  - Access to ITER via dedicated VPN
  - Access to XPOZ (remote participation segment)
  - Access to live data
  - Remote control room setup replicating main control room
- On-site (ITER IT network)
  - (treated same as “off-site research”)

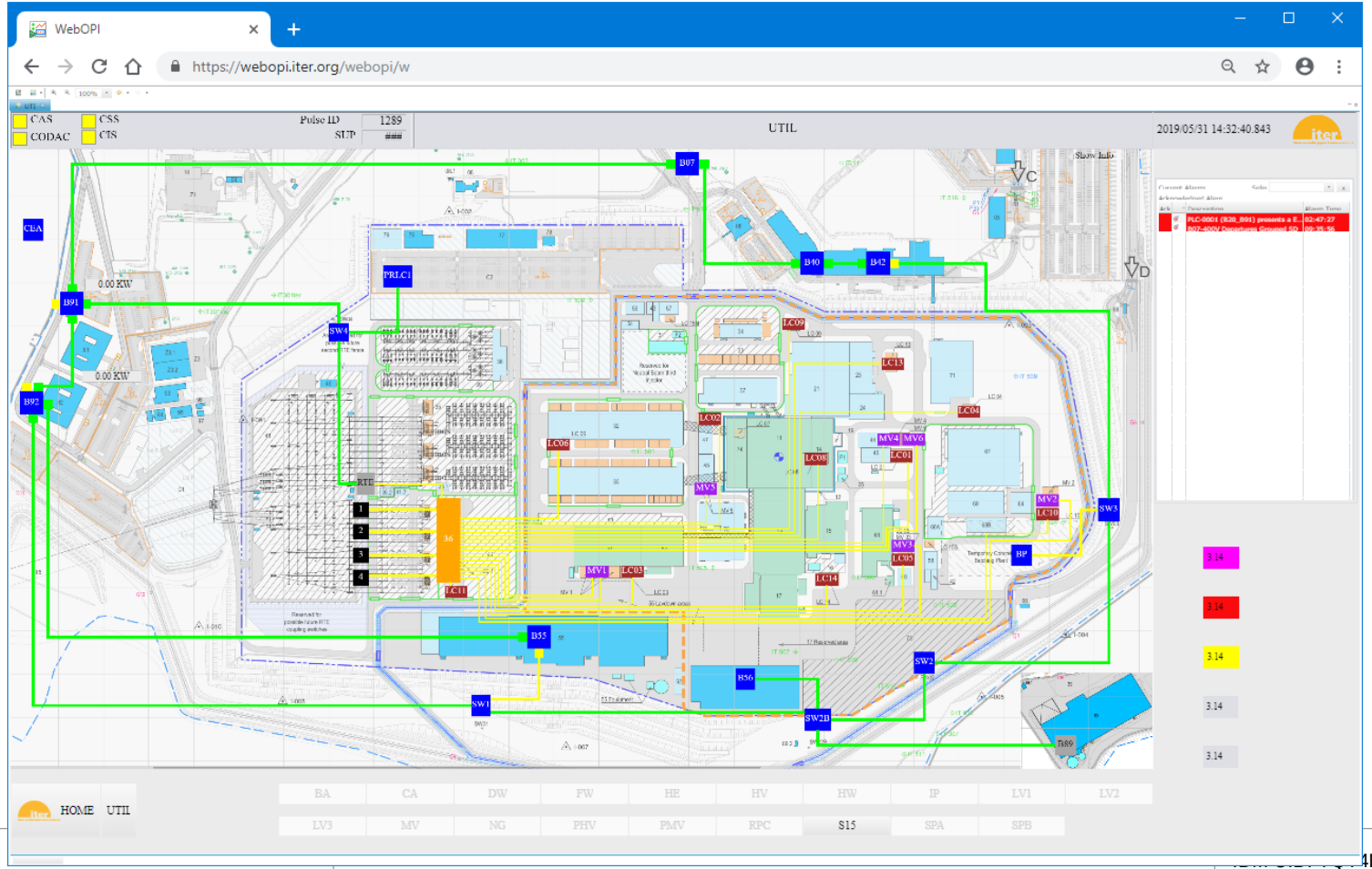
Why Web Tools?

- Server-side intelligence – easier to control / modify
- No software to manage on user side
- Low learning effort; use out of the box
- Functionality nearly equal to standard desktop environment
- Use of standard protocols / ports – simplifies network setup
- Established mechanisms for user authentication
- …

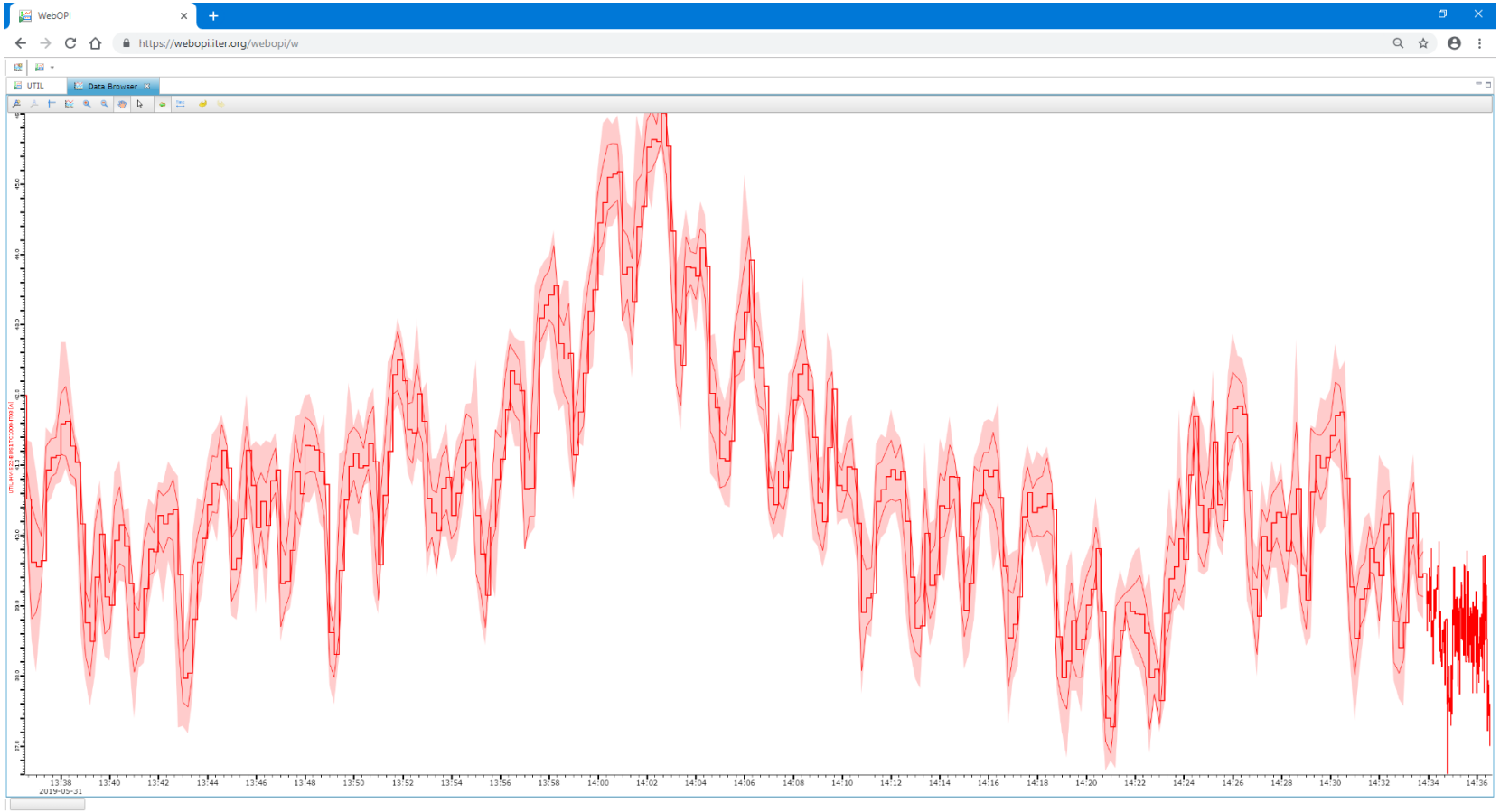
ITER Basic Requirements

- Live access to run-time data
- Easy access to archived data
- Screen designing capabilities, dashboards
- Rich drawing interface, basic operations
- Scalability
- …
- … if possible, avoid writing a yet another tool

CS-Studio Web OPI



CS-Studio Web Data Browser



CS-Studio Web Tools

(+) Part of standard CODAC software stack

(+) Reuse of existing screens (some tweaks are needed)

(+) EPICS connection out of the box

(+) Access to source code + community

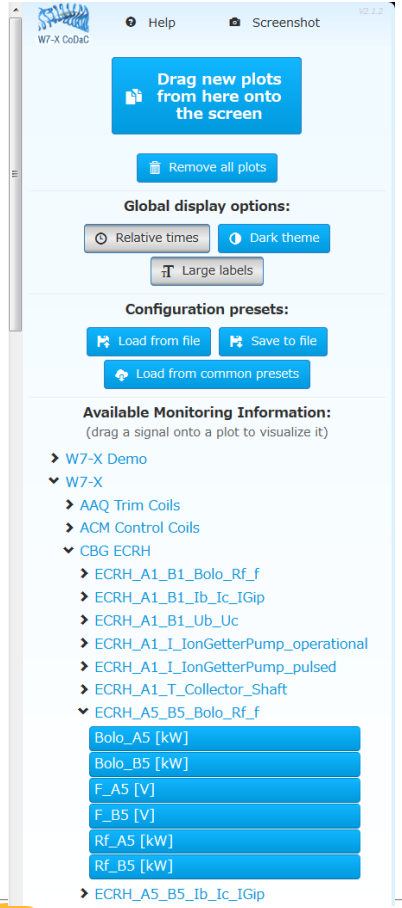
(?) Too operator-oriented, no dashboards

(?) Scalability

(?) Support and future. ITER has to maintain its own branch and fixes

Status: baseline, but needs to be complemented with other functions

W7-X DAVInCI



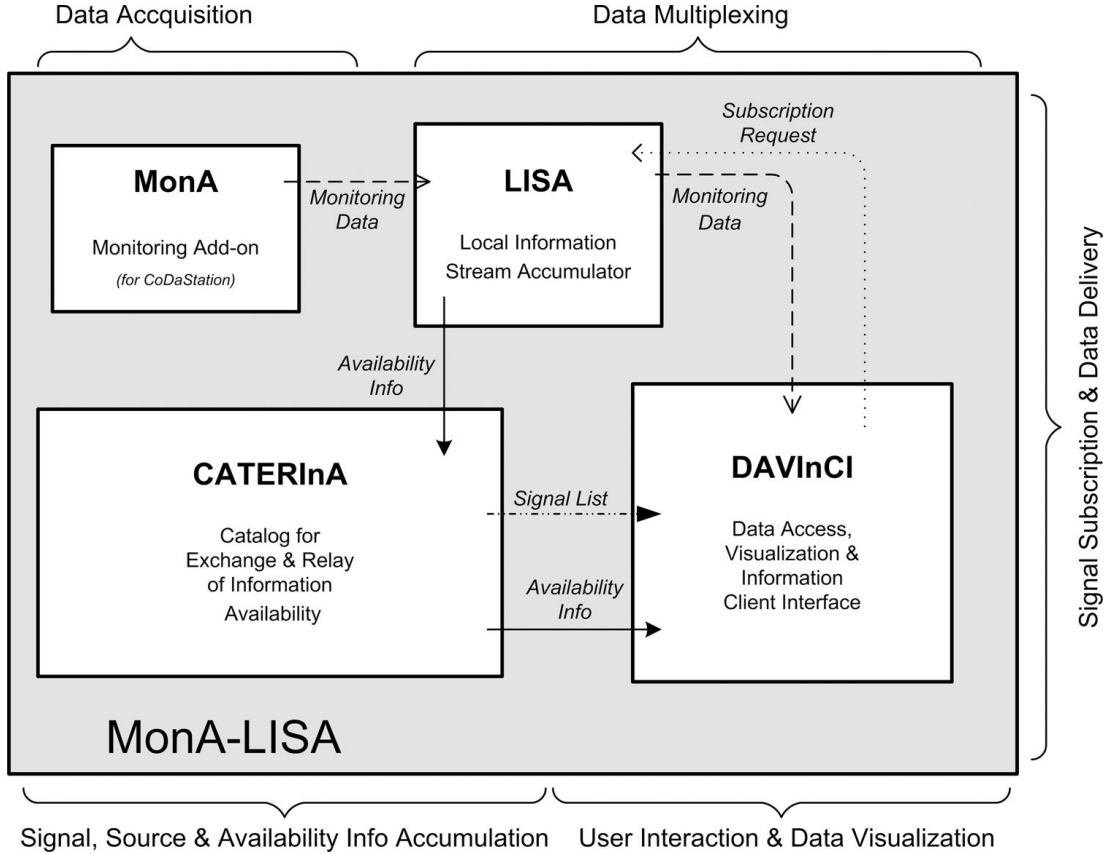


Image credit: Dumke, 11th IAEA TM on Control, DAQ & RP, 2017

W7-X Screens


AAQ11 -actual value, AAQ22 -actual value, AAQ11 -actual value, AAQ41 -actual value, AAQ51 -actual value
Density Single Channel Interferometer
15:37:31 W7-X
ecegarbageypr_v4 - LOOP
cryo
PB
average_hpa
average_lpa
inlet
outlet
AAQ11 -actual value
AAQ22 -actual value
AAQ31 -actual value
AAQ41 -actual value
Be invited to try it out yourself at
http://datamonitor.ipp-hgw.mpg.de
(Only available within the IPP network)
Your CoDaC Team
Planar coils B current

W7-X Tools

(+) Modern, nice look & feel

(+) Functionality, user-defined screens

(+) Scalability

(?) No EPICS or UDA connectors

(?) Portability

(?) Access to source code

Status: demo version installed at ITER, evaluation on-going

Other Candidates?

Conclusion

- Web tools to navigate EPICS and other machine data are clearly needed
- CS-Studio is a baseline but has limitations
- Studies ongoing