



14th International Conference on Accelerator and Large Experimental Physics Control Systems (ICALEPCS 2013)
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San Francisco, California



THE CODAC SOFTWARE DISTRIBUTION FOR THE ITER PLANT SYSTEMS

Abstract

In order to support the adoption of the ITER standards for the Instrumentation & Control (I&C) and to prepare for the integration of the plant systems I&C developed by many distributed suppliers, the ITER Organization is providing the I&C developers with a software distribution named CODAC Core System. This software has been released as incremental versions since 2010, starting from preliminary releases and with stable versions since 2012. It includes the operating system, the EPICS control framework and the tools required to develop and test the software for the controllers, central servers and operator terminals. Some components have been adopted from the EPICS community and adapted to the ITER needs, in collaboration with the other users. This is the case for the CODAC services for operation, such as operator HMI, alarms or archives. Other components have been developed specifically for the ITER project. This applies to the Self-Description Data configuration tools. This software has also been used for the production of the first I&C applications in Cadarache for the monitoring of power stations.

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CODAC Core System

- ❖ The Software distribution produced by the ITER Organization (IO) for configuring all systems (terminals, servers and controllers) both at ITER site and at the construction sites
- ❖ Includes
 - Software infrastructure
 - Read Hat Enterprise Linux (RHEL)
 - EPICS
 - The software components required for the target system,
 - The development tools when required

- ❖ Regular releases twice a year
 - New components
 - Improvements
 - Bug fixes
- ❖ If required, maintenance release and patches
- ❖ Issue tracking and change management with Bugzilla
- ❖ Regular test process prior to each release
- ❖ On-line support with dedicated team and issue tracking
- ❖ Training
 - On-site (Cadarache)
 - At Domestic Agencies (KO, US, JA...)
 - On-line (new)

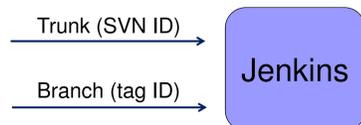
Release	Fixed issues
3.0.0 (2012-02-15)	468
3.1.0 (2012-06-22)	305
4.0.0 (2013-02-15)	428
4.1.0 (2013-06-22)	411

- ❖ Automated build with standardized process (compile/test/package)
- ❖ Supported versions: *major_nb.minor_nb.maintenance_nb*
- ❖ All versions pushed to a distribution server
- ❖ Official versions downloaded by the end users (yum)
 - On-site systems
 - Anywhere with a network path to IO (registered users only)
- ❖ Daily version for continuous integration and tests (trunk)
- ❖ Beta versions for pre-release tests.

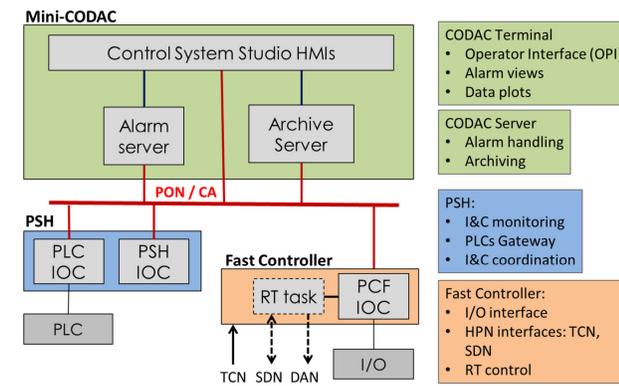
ITER Source repository (SVN)

Trunk	1.0	1.1	2.0	2.1	3.0	3.1	4.0	4.1	4.2
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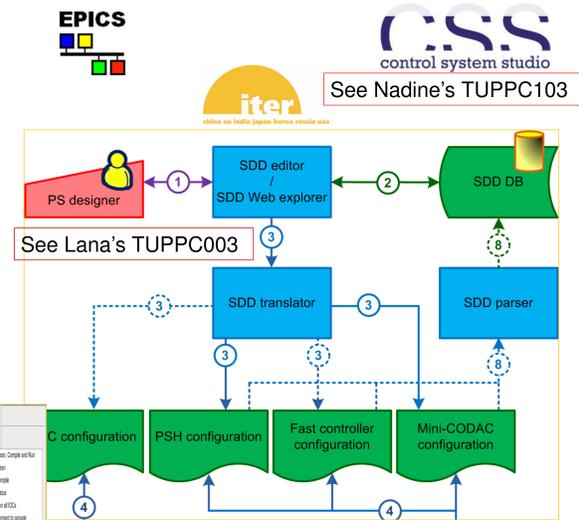
branches



Software components for operation



Development tools



RHEL	V1.0	V1.1			
RHEL 5.3	V1.0 Feb-10	V1.1 Jun-10			Preliminary
RHEL 5.5	V2.0 Feb-11	V2.1 Feb-12			Deprecated
RHEL 6.1 MRG-R 2.0	V3.0 Feb-12	V3.1 Jul-13			Supported
RHEL 6.3 MRG-R 2.1	V4.0 Feb-13	V4.1 Jul-13	V4.2 Feb-14	V4.3 (TBC) Jul-14	Supported
RHEL 6.5 EPICS 3.15	V5.0 TBD				

2013 supported hardware (Linux + EPICS)

- Siemens S7/400 S7/300
- PXI/PXIe chassis
- NI PXI-6259, PXI-6682/6683-H, PXI-6528
- NI PXIe-6368 (beta version)

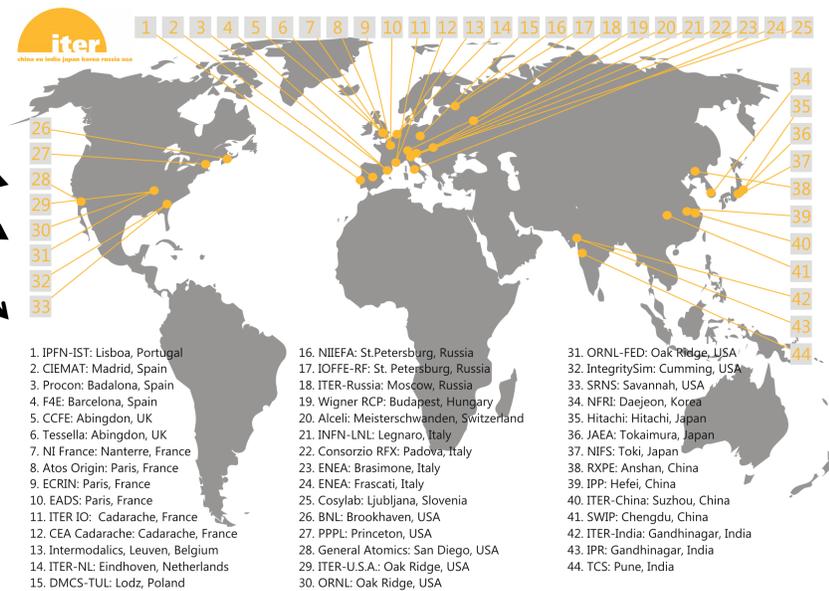
2014 candidate features

- Tests tools (plant system I&C tests)
- Data archiving (scientific data and other large data)
- NI FlexRIO support
- Support for RT programs (EPICS interface, tuning)

Distribution Server (RHEL satellite server)

1.0.0	1.1.0	2.0.0
2.0.1	2.1.0	3.0.0
3.1.0	4.0.0	4.1.0
4.2b1	4.2b2	

RPMs (version number)



- IPFN-IST: Lisboa, Portugal
- CIEMAT: Madrid, Spain
- Procon: Badalona, Spain
- F4E: Barcelona, Spain
- CCFE: Abingdon, UK
- Tessella: Abingdon, UK
- NI France: Nanterre, France
- Atos Origin: Paris, France
- ECRIN: Paris, France
- EADS: Paris, France
- ITER IO: Cadarache, France
- CEA Cadarache: Cadarache, France
- Intermodalics: Leuven, Belgium
- ITER-NL: Eindhoven, Netherlands
- DMCS-TUL: Lodz, Poland
- NIEFA: St.Petersburg, Russia
- IOFFE-RF: St. Petersburg, Russia
- ITER-Russia: Moscow, Russia
- Wigner RCP: Budapest, Hungary
- Alcelf: Meisterschwanden, Switzerland
- INFN-LNL: Legnaro, Italy
- Consorzio RFX: Padova, Italy
- ENEA: Brasimone, Italy
- ENEA: Frascati, Italy
- Cosylab: Ljubljana, Slovenia
- BNL: Brookhaven, USA
- PPPL: Princeton, USA
- General Atomics: San Diego, USA
- ITER-U.S.A.: Oak Ridge, USA
- ORNL: Oak Ridge, USA
- ORNL-FED: Oak Ridge, USA
- IntegritySim: Cumming, USA
- SRNS: Savannah, USA
- NFRE: Daejeon, Korea
- Hitachi: Hitachi, Japan
- JAEA: Tokaimura, Japan
- NIJS: Toki, Japan
- RXPE: Anshan, China
- IPP: Hefei, China
- ITER-China: Suzhou, China
- SWIP: Chengdu, China
- ITER-India: Gandhinagar, India
- IPR: Gandhinagar, India
- TCS: Pune, India

