

Control System Configuration Management at PSI Large Research Facilities

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The control system of the PSI accelerator facilities and their beamlines consists mainly of the so called Input Output Controllers (IOCs) running EPICS. There are several flavors of EPICS IOCs at PSI running on different CPUs, different underlying operating systems and different EPICS versions. We have hundreds of IOCs which control the facilities at PSI. The goal of the Control system configuration management is to provide a set of tools to allow a consistent and uniform configuration for all IOCs. In this context the Oracle database contains all hardware-specific information including the CPU type, operating system or EPICS version. The installation tool connects to Oracle database. Depending on the IOC-type a set of files (or symbolic links) are created which connect to the required operating system, libraries or EPICS configuration files in the boot directory. In this way a transparent and user-friendly IOC installation is achieved. The control system expert can check the IOC installation, boot information, as well as the status of loaded EPICS process variables by using Web applications.

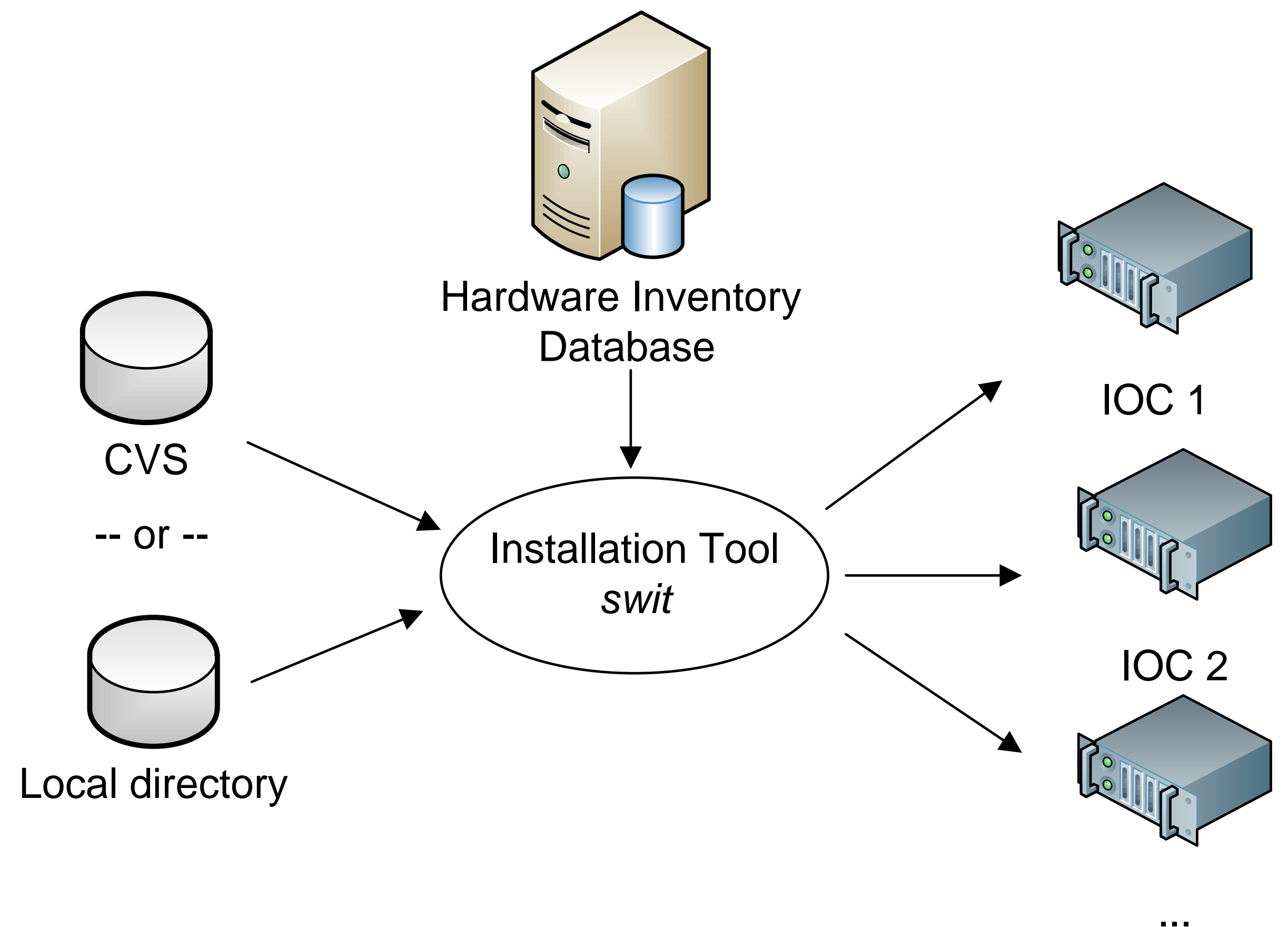
Configuration and Installation

Configuration and Installation Process

- Create configuration files and all the software needed to run an IOC on the file system. The configuration for specific IOC functionality is defined as a project and stored by using CVS.
- *swit* retrieves the configuration from the file systems or from the CVS, connects to the Hardware Inventory Database for IOC's specific information.
- *swit* installs the software in the IOC's boot directory.

Installation Tool Features

- *swit* allows software installation for testing or production.
- *swit* can install software for multiple IOCs.
- *swit* installs software from different projects into one target IOC.
- All IOCs types running in large research facilities at PSI can be installed by the tool.
- Uniform IOC boot directory structure is used for all IOCs in large research facilities at PSI.



Hardware Inventory Database

- Controls hardware information is stored in the Hardware Inventory Database in a hierarchical way.
- The database supports the work flow for hardware components requests, orders, delivering and installation.
- For IOCs components, there is also host related information available, (e.g. host name, CPU, operating system and EPICS version, network and serial connections etc.) .

IOC Boot Information

Information such as boot date, boot server name, operating system and EPICS version, is automatically stored during the boot process in the database. Users can view it by using the Web interface or a command line script can be used as well.

IOC EPICS PVs

Device Pattern	EPICS Live	Record	Value	EGU	Status	Severity	Type	IOC	Loaded
FIN	FIND1-MCRY30-APP-ID	103		UDF	INVALID	bo		FIN-M-CV10W	8/13/2013 11:06:24 AM
FIN	FIND1-MCRY30-B-CYC			UDF	INVALID	bo		FIN-M-CV10W	8/13/2013 11:06:17 AM
FIN	FIND1-MCRY30-COMMISSION	41061720		NO_ALARM	NO_ALARM	longout		FIN-M-CV10W	8/13/2013 11:06:29 AM
FIN	FIND1-MCRY30-CPLD-VERS	4		NO_ALARM	NO_ALARM	calc		FIN-M-CV10W	8/13/2013 11:06:20 AM
FIN	FIND1-MCRY30-DAC1-OFS	0.000		A	UDF	INVALID	ao	FIN-M-CV10W	8/13/2013 11:06:11 AM
FIN	FIND1-MCRY30-DAC1-SCA	0.000		VIA	UDF	INVALID	ao	FIN-M-CV10W	8/13/2013 11:06:11 AM
FIN	FIND1-MCRY30-DAC2-OFS	0		A	UDF	INVALID	longout	FIN-M-CV10W	8/13/2013 11:06:29 AM
FIN	FIND1-MCRY30-DAC2-OFS	0.000		A	UDF	INVALID	ao	FIN-M-CV10W	8/13/2013 11:06:11 AM
FIN	FIND1-MCRY30-DAC2-SCA	0.000		VIA	UDF	INVALID	ao	FIN-M-CV10W	8/13/2013 11:06:11 AM
FIN	FIND1-MCRY30-DAC2-SET	0		UDF	INVALID	longout		FIN-M-CV10W	8/13/2013 11:06:29 AM
FIN	FIND1-MCRY30-DL-DATA0					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-DATA1					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-DATA2					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-DATA3					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-DATA4					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-DATA5					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-DATA6					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-DEST	19		NO_ALARM	NO_ALARM	longout		FIN-M-CV10W	8/13/2013 11:06:29 AM
FIN	FIND1-MCRY30-DL-LEN	4000		NO_ALARM	NO_ALARM	longout		FIN-M-CV10W	8/13/2013 11:06:29 AM
FIN	FIND1-MCRY30-DL-PDAT0					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-PDAT1					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-PDAT2					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-PDAT3					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-PDAT4					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-PDAT5					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-PDAT6					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-PDAT7					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-PDAT8					waveform		FIN-M-CV10W	8/13/2013 11:06:37 AM
FIN	FIND1-MCRY30-DL-SFLGCLR			UDF	INVALID	bo		FIN-M-CV10W	8/13/2013 11:06:17 AM
FIN	FIND1-MCRY30-DL-SFLGSET			UDF	INVALID	bo		FIN-M-CV10W	8/13/2013 11:06:17 AM
FIN	FIND1-MCRY30-DL-START	DOWNLOAD		UDF	INVALID	bo		FIN-M-CV10W	8/13/2013 11:06:17 AM
FIN	FIND1-MCRY30-DL-STAT	Unknown		NO_ALARM	NO_ALARM	mbbi		FIN-M-CV10W	8/13/2013 11:06:31 AM
FIN	FIND1-MCRY30-DL-STOPLG	NO		UDF	INVALID	bo		FIN-M-CV10W	8/13/2013 11:06:17 AM

All EPICS PVs loaded on an IOC during booting are stored automatically in the database. Their names, values record types, alarm status and load date can be seen by using dedicated Web interface. Scalar values are accessible for live update as well.