



EpicsOra and I/O hardware

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EpicsOra

Tool for building EPICS databases

- Oracle 9i database
- Oracle Web Forms UI
- Plans to link with hardware data

Project

The screenshot displays the EPICS Navigator interface. On the left, a tree view shows the project structure under 'PROJECTS'. The 'SMES' project is selected. Below it, the 'PROTOTYPES' section lists various components like 'temp_val', 'pid_on', 'ai_4-20', 'AnaValve', 'an_4-20', 'dig Valve', 'din', 'mbbIDirect', 'mbhaDirect', 'tempD', and 'tempICD'. Under 'INSTANCES', 'TSMCAN45' is listed with sub-entries 'TSMCAN45_langin' and 'TSMCAN45_mbbID'. On the right, a 'Project: SMES' window is open, showing a table of project metadata and a section for setting parameter values.

Name	Value
Project: SMES	
Name	SMES
Description	--
Default Epics	EpicsRS 13.10-D3
Default IOC	ttSMES
Date created	08-09-04 15:55:59
Created by	Genie

Parameters * Set Declare

Name	Value
P	TSM

Prototype

The screenshot shows the EPICS GUI interface. On the left is a project tree with the following structure:

- EPICS_RELEASE
- TEMPLATES
- PROJECTS
 - HE-OPC
 - He-Bilanz
 - EP-PIO
 - IRM Spawning
 - Komp H47a
 - Magnet-Testhalle
 - OraJava
 - SMES
 - PROTOTYPES
 - scmp_red
 - pid_on
 - ai_4-20 (selected)
 - RECORDS
 - AnalogInput
 - Archive
 - AnaValve
 - ai_4-20
 - dig Valve
 - dis
 - subbDirect
 - subbDirect
 - scmpD
 - scmpRTD

On the right is the Property Palette for the selected prototype 'ai_4-20':

Class			
Prototype: ai_4-20			
Name	ai_4-20		
Subprototype name rule	\$(name)		
Instance name rule	\$(P)\$(name)		
Config VDCT	Size 0	Insert	Delete
graphic JetMlist	Size 0	Insert	Delete
Project	SMES		
Type(base/composite)	base		
Epics Release	Epics03.13.10-D0		
Template	Sensor		
Date created	01-09-04 12:01:00		
Created by			
* Parameters / \$Link/\$Conn / Instances			
Declare parameters		Delete	
Name	Description		
descr	Description		
high	phys. Max		
low	phys. Min		
name	ID_name		

Prototype Records

The screenshot shows the EPICS software interface. On the left is a 'Project Navigator' window displaying a tree structure of projects and prototypes. The 'PROTOTYPES' section is expanded, showing a sub-section 'RECORDS' with a record named 'AnalogInput' selected. On the right is a 'Record Configuration' window titled 'Prototype record: AnalogInput[ai] top level: ai_4_20'. This window contains a table of record parameters.

Parameter	Value	Description
DESC	ai_4_20	\$(desc)
ASG		
SCAN	ai_4_20	1 second
PINI		NO
PHAS		0
EVNT		0
TSEL		
DTYP	ai_4_20	CANopen
DISV		1
SDIS		
ACKT		NO
DISS		NO_ALARM
PRIO		LOW
UDF		1
FLNK		
VAL		0
INP		
PREC	ai_4_20	2
LINR	ai_4_20	LINEAR
EGUF	ai_4_20	\$(high)
EGUL	ai_4_20	\$(low)
EGU	ai_4_20	\$(egu)

Instantiated Records

The screenshot shows the EPICS ECR Window with a tree view on the left and a detailed record view on the right.

Tree View (Left):

- TSM5P2R22
- TSM5TC2V13
- TSM5TC2V14
- TSM5TC2V15
- TSM5TC2V31
- TSM5TC2V32
- TSM5TC2V33
- TSM5TP3V24
- TSM5TP4R25
- TSM5TP9R17
- TSM5TP9R18
- TSM5TP9R17
- TSM5TP9R17_ai
- TSM5TP9R18
- TSMTriggering
- TSMVA2V13
- TSMVD2R16
- TSMVD2R19
- TSMVT9R17
- TSMVF9R18
- TSMVL2V12
- TSMWVtrbleg
- HARDWARES
- TF2
- TdeT2003
- Vibration DSM

Record View (Right):

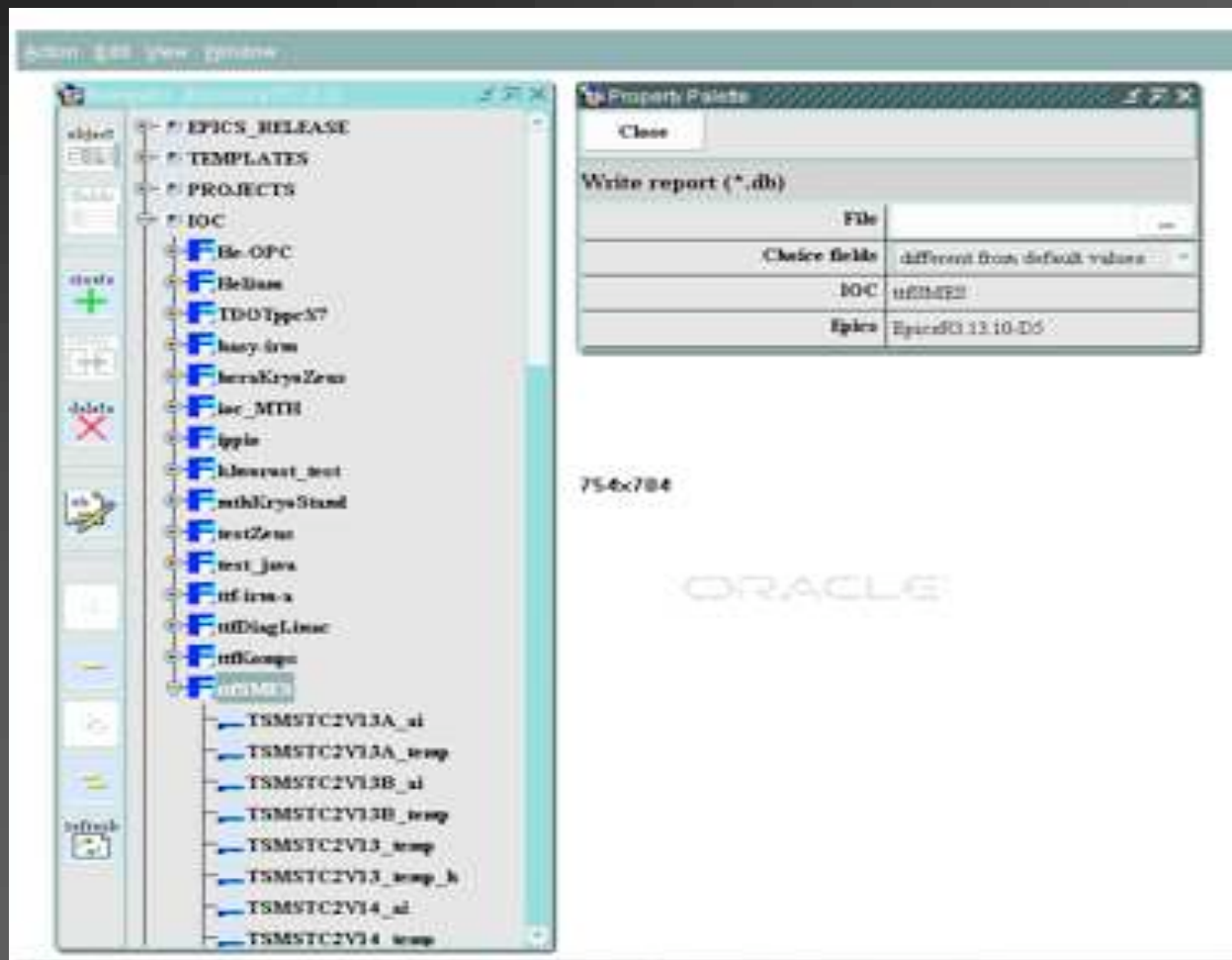
Instance record: TSMST9R17_ai(ai)

default	
ai_4-20	\$(desc)
ai_4-20	SZF (-) Spannungsabfall

nhf instance

DESC	ai_4-20	SZF (-) Spannungsabfall
ASG		
SCAN	ai_4-20	1 second
PINI		NO
PHAS		0
EVNT		0
TSEL		
DTYP	ai_4-20	CANopen
DISV		1
SDIS		
ACKT		NO
DISS		NO_ALARM
PRIO		LOW
UDF		1
FLNR		
VAL		0
INP		@CAN:036[4] 1-6553*
PREC	ai_4-20	2
LNHR	ai_4-20	LINEAR
EGUF	ai_4-20	200
EGUL	ai_4-20	0

.db file for IOC



Link with hardware: EPICS fields

- e.g. INP
- Device-specific formatted string, e.g. `@CAN1:N36[4] 'L=6553'`
- Parameters in string are device attributes, node, channel, limits...etc

Goals

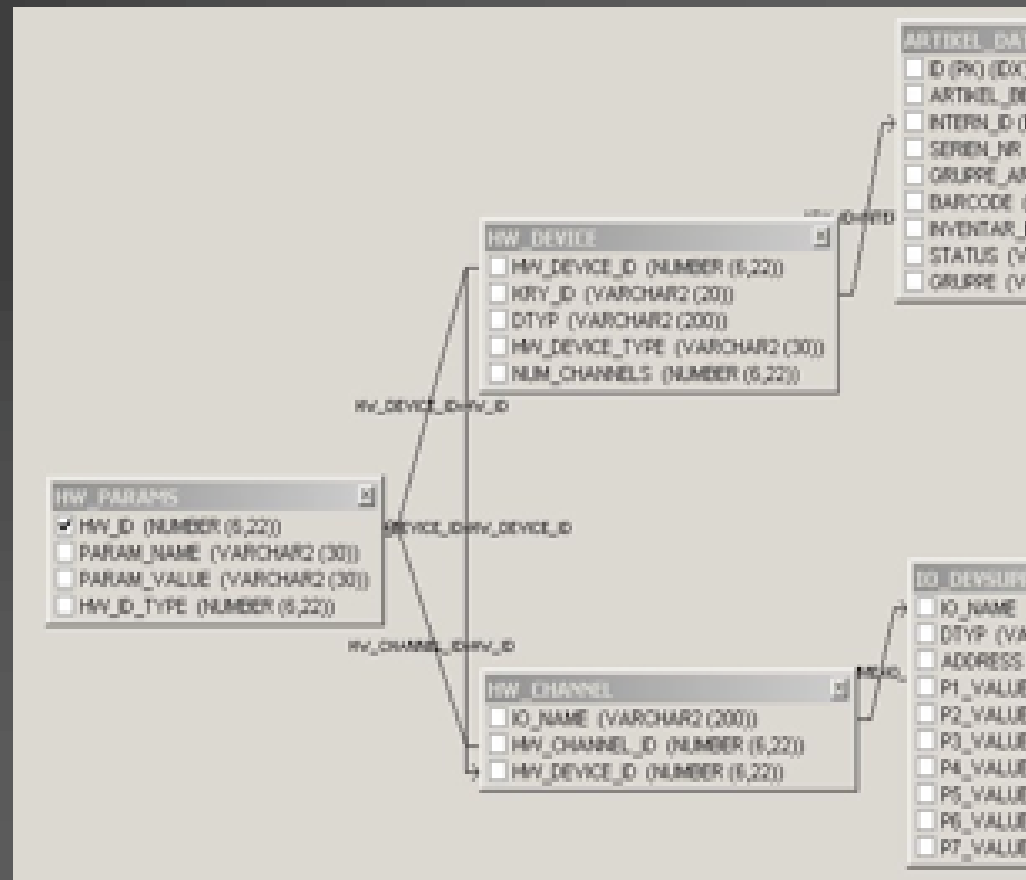
- Keep device data separate from EpicsOra database (can change devices with minimal changes to EpicsOra)
- Link EPICS PV to hardware device data
- Link hardware device to its EPICS PVs
- Link with assets database, other device data
- Pull EPICS address string parameters and values from device data
- Automatically generate formatted address string

IO_NAME

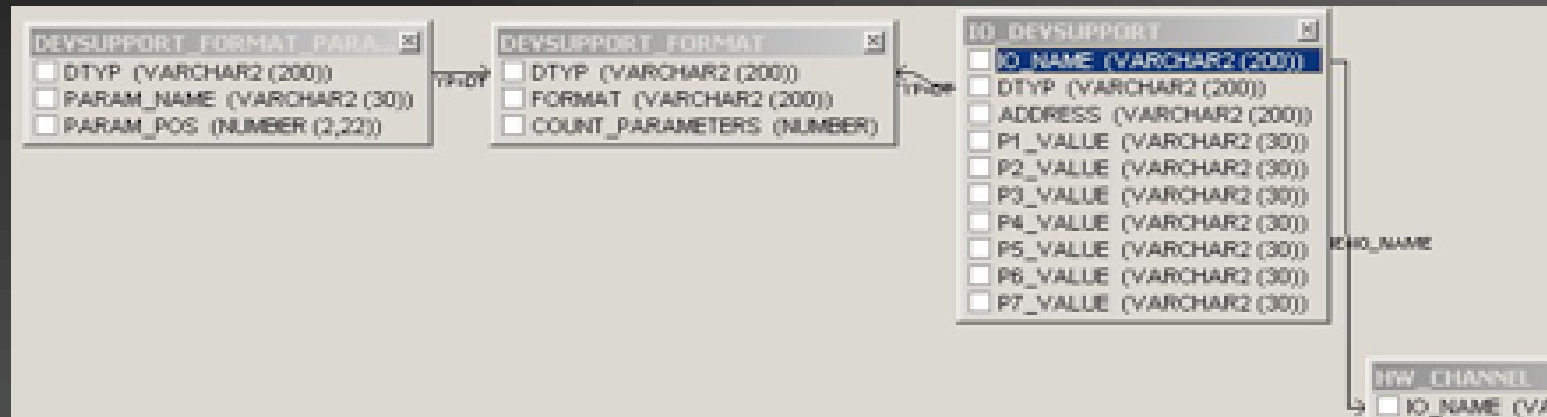
- Unique name associated with hardware channel
- Used by EpicsOra as a link to device data
- Can change device used by EPICS PV by moving the IO_NAME to another channel

Hardware device schema

- One device to many channels
- HW_PARAMS has list of device and channel parameter names + values
- Link to EpicsOra via HW_CHANNEL IO_NAME
- Link to assets db via HW_DEVICE. KRY_ID

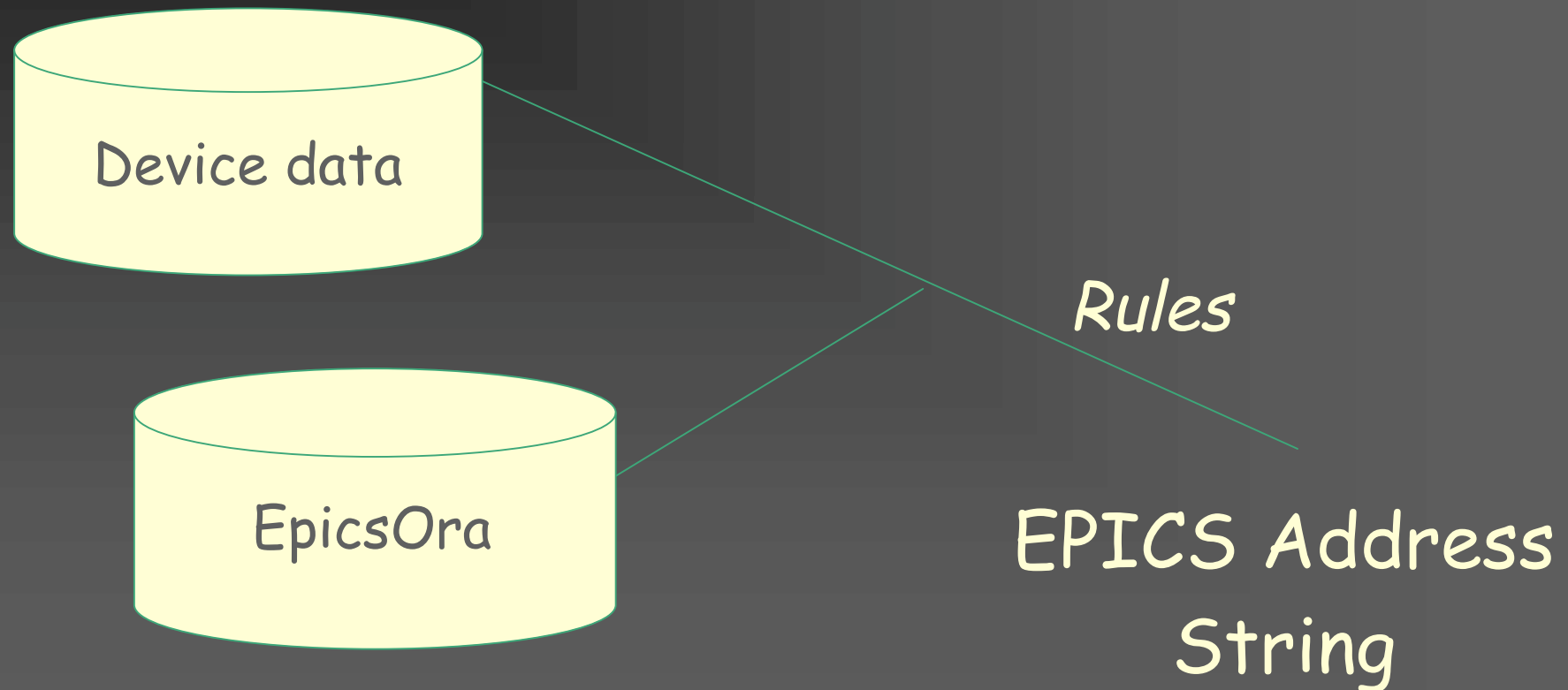


EpicsOra device schema

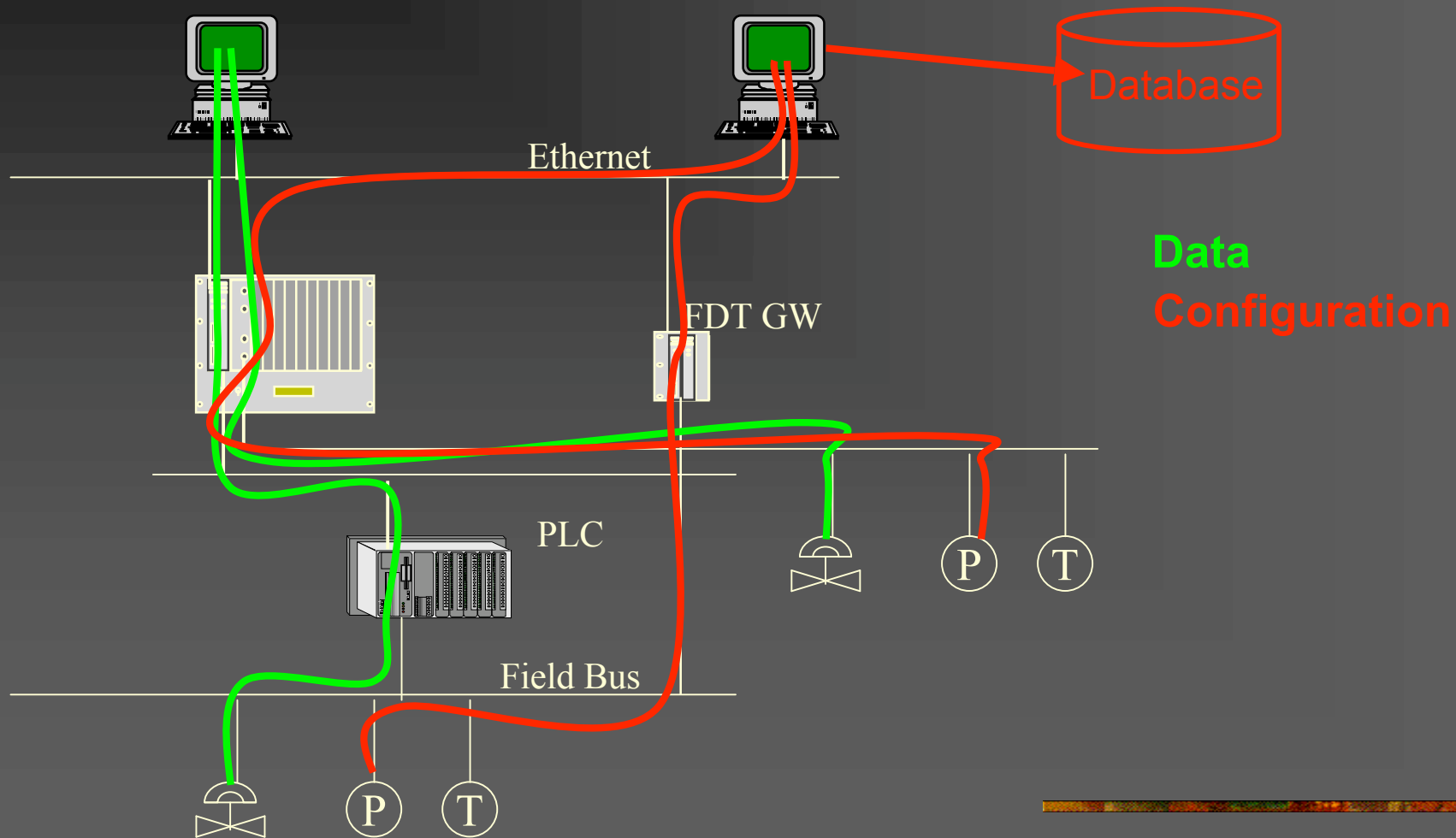


- DEVSUPPORT_FORMAT has format string
- IO_DEVSUPPORT links to hardware channel with IO_NAME; triggers assemble EPICS address strings with param values
- Param names and values from HW_PARAMS table

Putting them together



Integrating Intelligent Devices



Further work...

- Add sensor data and scaling parameters and functions to the device schema
- Add generic device class definitions to the device schema
- MS Excel used for device data; may use Excel VB macros as interface to Oracle
- Stored procedures, Oracle Forms code for managing the schemas
- Import flat EPICS .db files into EpicsOra