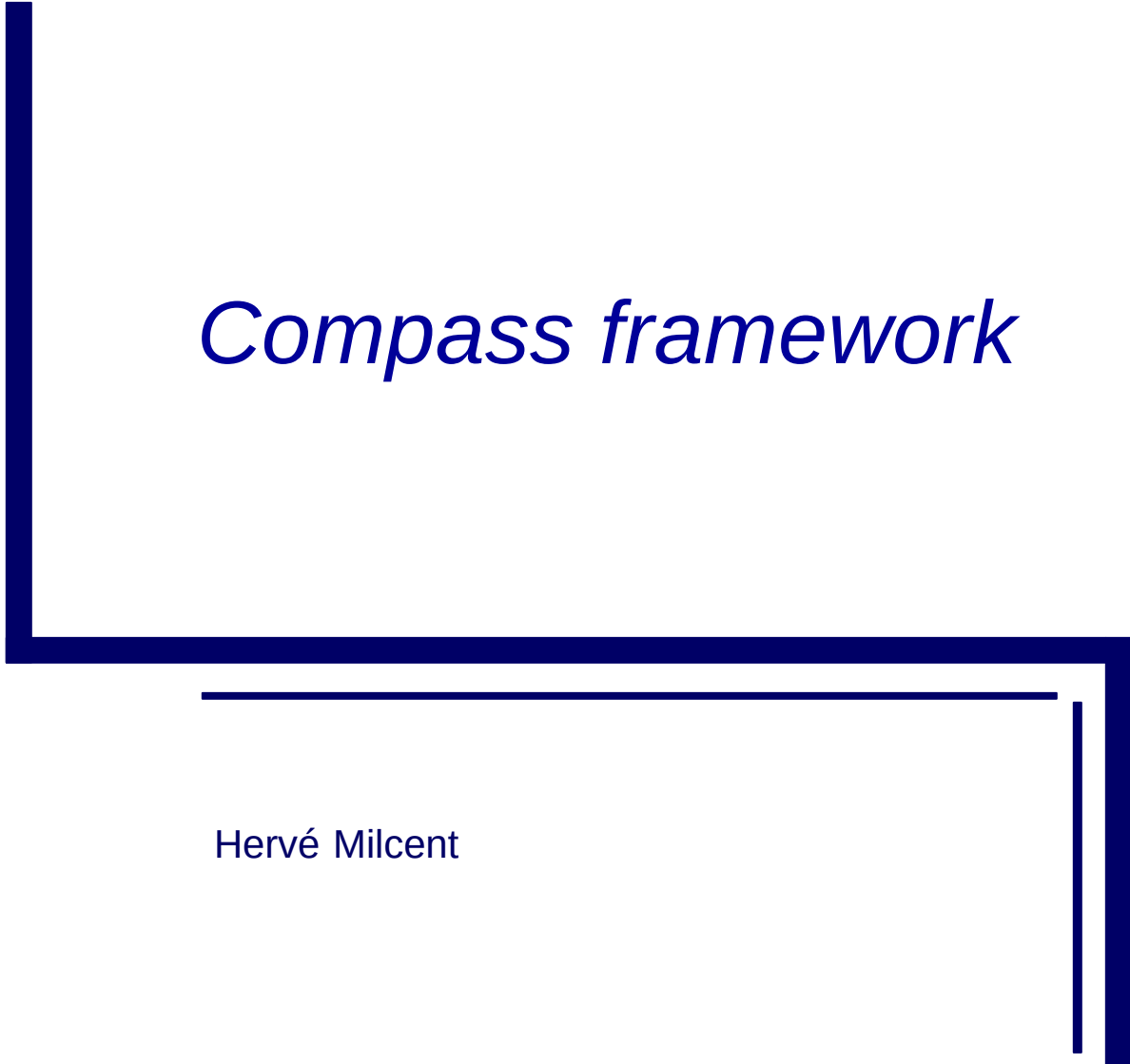




Compass framework

Hervé Milcent



Content

- History
- Architecture
- Framework concept
- Framework elements types
- Framework panels
- Conclusions



History

Archit.

Concepts

Elt. type

Panels

Conclusions

IT-CO

- One year
- Help and advise
- Questionnaire
- Interview
 - common elements: HV, WIENER fan tray, etc.
 - common needs: user access, archiving, etc.
 - detector with existing DCS.
- User requirement document
- Analysis, scenario (use case)



History

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Conclusions

IT-CO

Constraints

- SCADA: for supervision
 - PVSS (Linux-NT)
- Commercial components
 - fieldbus: PROFIBUS, CAN
 - OPC
- Re-use running software
 - VME-NA48 front-end software
 - communication protocols: DIM



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History

Archit.

Concepts

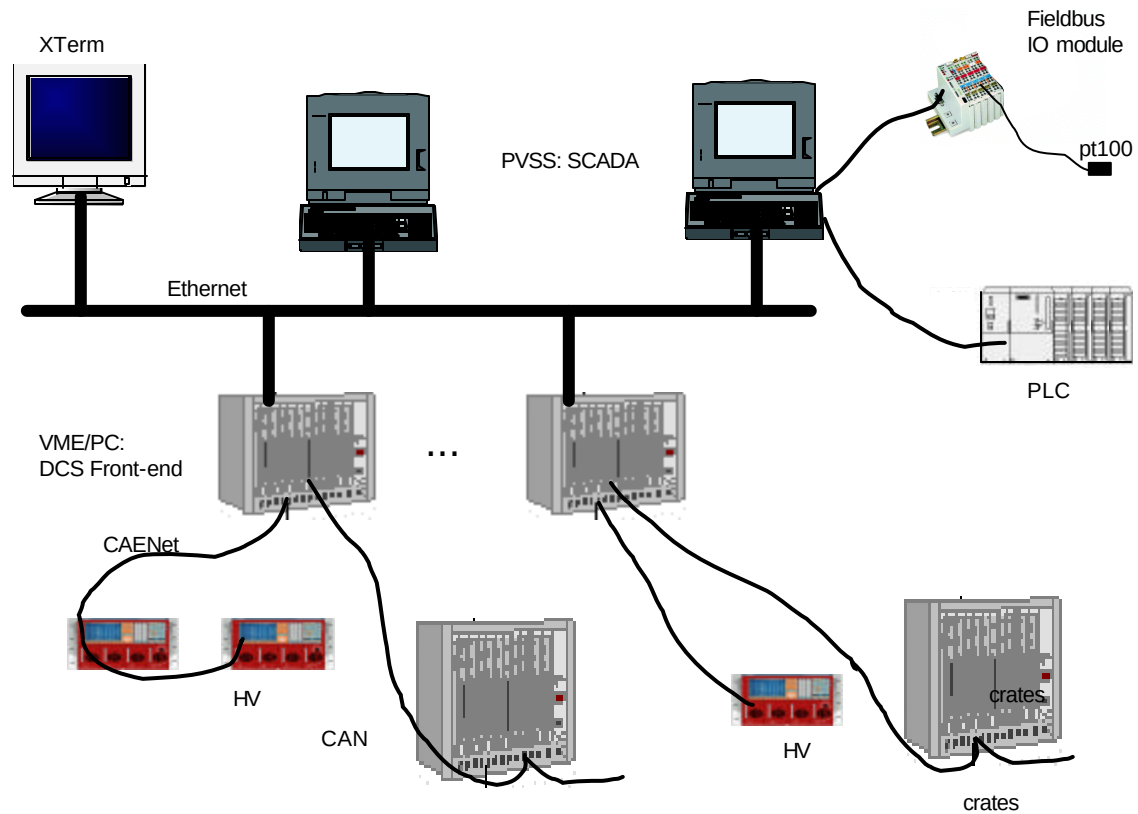
Elt. type

Panels

Conclusions

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Hardware/software architecture



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History

Archit.

Concepts

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Panels

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Interviews results:

- Common hardware elements
- Common software requirements
 - access to the elements
 - user access, etc.
- Element classified in a hierarchical way



A Framework:

- Common representation
- Same behavior
- Ease the development of the DCS



History

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Conclusions

IT-CO

The Framework

- Library of common elements types:
 - analogue input, digital input, HV, etc.
- Tree hierarchy
- Behavior
- SCADA implementation hidden from the developer
- Library of PVSS panels:
 - configuration
 - operation
- Integration of user-defined elements types
- Front-end software and its configuration tool



History

Archit.

Concepts

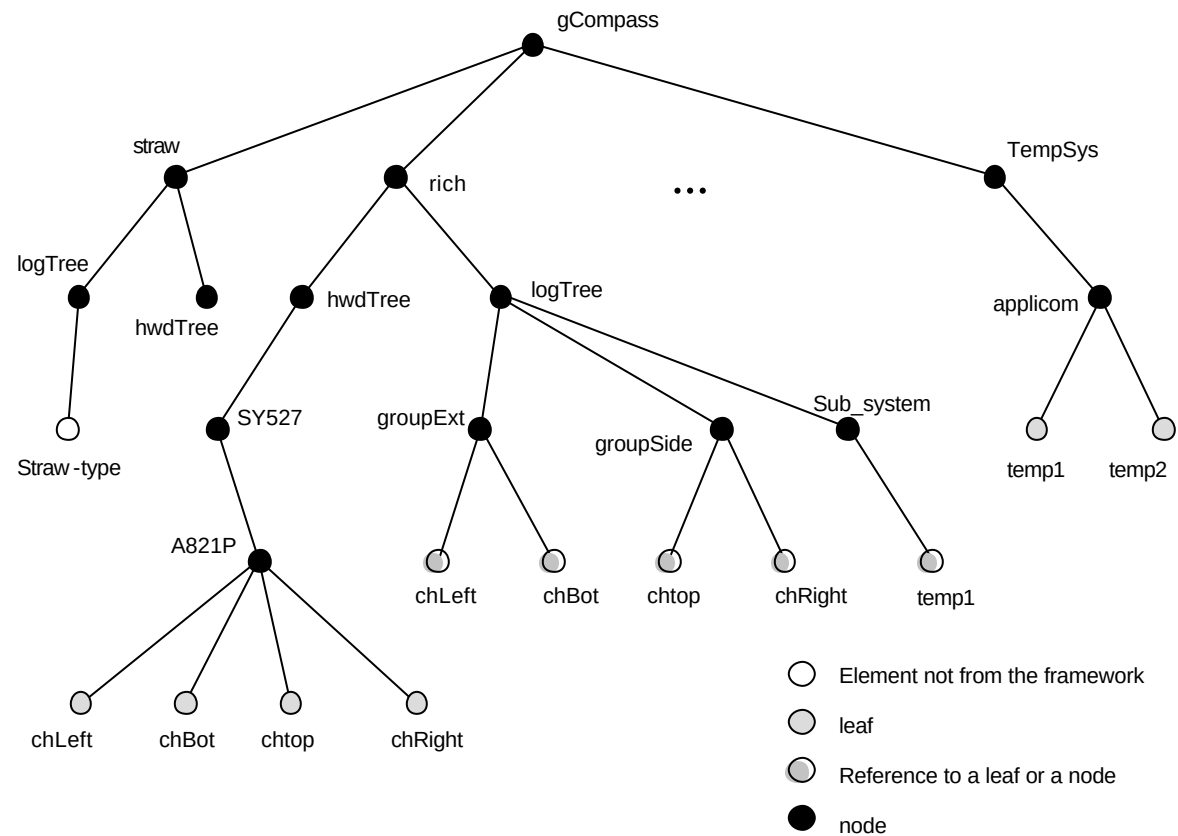
Elt. type

Panels

Conclusions

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Tree hierarchy



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History

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- Alarms: anomaly on an element, a wrong state, diagnostic, etc.
 - categories: warning, fault, fatal
 - alarm on leaves, summary alarms on nodes
 - propagated to the top of the tree
 - mask/un-mask/acknowledge at leaf or node level
- Action: from top to bottom
 - enable/disable
 - mask/un-mask
 - acknowledge
 - HV action: HV groups, HV systems



History

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Elements types

- DETECTOR element type
 - hardware tree, logical tree
- Input/output data: analogue, digital
 - OPC, DIM
- HV: Front-end software, DIM
 - SY127, SY403, SY527
 - HV channel
 - HV group, HV system
- SUB_SYSTEM
- SERVICE
- Fan-tray



History

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HV

- Re-use JCOP HV configuration tools
 - defining the elements
 - importing the front-end configuration
- Add COMPASS specific requirements
 - alarms configuration
 - DIM, OPC connection
- Add HV behavior
 - automatic mask of the alarm during ramping time
 - alarm limits on the readout voltage automatically adjusted
 - pre-empted user action



History

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Interfacing new elements

- User-defined elements
- At DETECTOR level: logical tree
- At SUB_SYSTEM level
- A standard interface has to be provided
- Up to the developer to configure and manipulate them



History

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IT-CO

Framework Panels

- Configuration panels
 - create/modify/add/delete configuration (alarms, archive, connection to hardware, etc.)
 - change the tree hierarchy
- Run-time:
 - to browse the tree hierarchy
 - to operate/view the elements
 - can be used in user defined panels
- Reference (symbol)
 - used in user defined panels to operate/view the elements
 - call run-time panels

Alarm color convention is implemented



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E.g: Analogue input configuration

History

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Almodification: Almodification

DCS: OFFLINE

name: dcs1:rich_AI_temperature

detector: dcs1:rich

description:

unit: degC conv

alert

☒ Alert ON/OFF alert category: Warning

if value > 30 show text: Bad value

if value between limits show text: OK

if value < 20 show text: Bad value

peripheral address of value

☐ none

☒ OPC OPC item: IN1.W100

☐ DIM OPC server: applicomOPCServer

archiving condition for value

☒ archive data

☒ archive with smoothing

☐ old/new comparison

☒ value-dependent archive deadband: 1

smoothing

☐ use deadband smoothing deadband: 1

parent: dcs1:rich go to ...

hwdOrig: dcs1:rich_HWD_1 go to ...

OK Apply cancel



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E.g: CAEN HV configuration (automatically imported)

History

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peripheral config: CAEN_HV_chPeriphConfig

DCS: OFFLINE

channel name:

☐ none

☐ OPC

☒ DIM

drvNr: ☒ use default FrontEnd

DIM service for enableCmd:

readBackSettings

DIM Service	for i0:	rich_CCH_127_chan2\$i0Set
DIM Service	for i1:	rich_CCH_127_chan2\$i1Set
DIM Service	for v0:	rich_CCH_127_chan2\$v0Set
DIM Service	for v1:	rich_CCH_127_chan2\$v1Set
DIM Service	for rDwn:	rich_CCH_127_chan2\$rDwn
DIM Service	for rUp:	rich_CCH_127_chan2\$rUp
DIM Service	for tripTime:	rich_CCH_127_chan2\$tripTime

settings

DIM Command	for i0:	rich_CCH_127_chan2\$i0SetCr
DIM Command	for i1:	rich_CCH_127_chan2\$i1SetCr
DIM Command	for onOff:	rich_CCH_127_chan2\$onOffCr
DIM Command	for rDwn:	rich_CCH_127_chan2\$rDwnSetCr
DIM Command	for rUp:	rich_CCH_127_chan2\$rUpSetCr
DIM Command	for tripTime:	rich_CCH_127_chan2\$tripSetCr
DIM Command	for v0:	rich_CCH_127_chan2\$v0SetCr
DIM Command	for v1:	rich_CCH_127_chan2\$v1SetCr
DIM command	vMaxSoftValue:	rich_CCH_127_chan2\$vMaxSoftValue

actual

DIM Service for hardwareAlarm:	rich_CCH_127_chan2\$hardwareAlarm
DIM Service for iMon:	rich_CCH_127_chan2\$iMon
DIM Service for vMon:	rich_CCH_127_chan2\$vMon
DIM Service for isOn:	rich_CCH_127_chan2\$isOn
DIM Service for isOverCurrent:	rich_CCH_127_chan2\$isOverCurrent
DIM Service for rampingDirection:	rich_CCH_127_chan2\$rampingDirection

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Summary

- COMPASS is taking data

Framework is used for elements from:

- 2 PROFIBUS bus
 - APPLICOM OPC.
 - Common readout: temperature, analog, etc.
 - TrigHodoscope movement system
- PLC connection: gas systems
 - Schneider PLC-OPC: RS232 line
- HV SY527, SY403
- Detector developer

User-defined panels using the Framework panels



Relevant to JCOP

History

Archit.

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Panels

- Test bed for technology integration
 - PVSS, OPC, Fieldbus (PROFIBUS), PLC, DIM
- Prototype of a particular framework
- Development of standard device types
 - configuration, operation mechanism
- FSM test
- Convergence with the JCOP framework

Conclusions



Participants

- VME front-end
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- PVSS
 - O. Holme, IT-CO (student)
 - H. Milcent, IT-CO
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 - J. Rossi, IT-CO (student)
 - N. Karlsson, COMPASS (student)
 - C. Schuhegger, COMPASS (student)
 - N. Sergueeva, COMPASS
 - V. Sougoniaev, COMPASS