

AlarmHandler

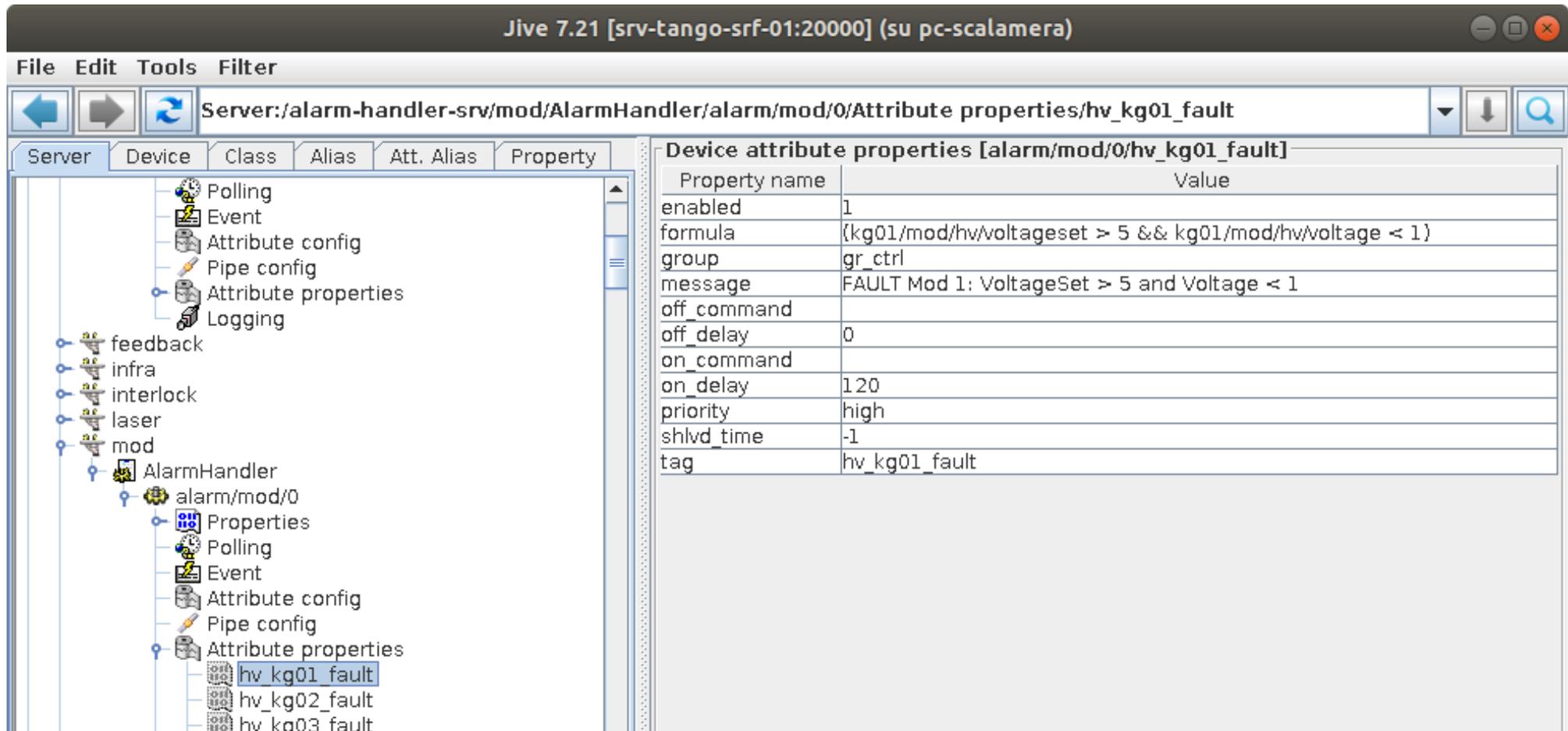
Graziano Scalamera

Main differences with old alarm system

- alarms are configured in attribute properties
- when an alarm is loaded a dynamic attribute with the same name is created
- alarm attributes are of DevEnum type with the following labels NORM, UNACK, ACKED, RTNUN, SHLVD, DSUPR, OOSRV, ERROR
- AlarmSummary attribute for overall alarms status + GetAlarmInfo command for detailed alarm information created to be compatible (to be checked/fixed) with PANIC
- AlarmManager: a device to ease configuration of new alarms and summarize status/statistics of all AlarmHandlers
- No dedicated DB for alarm history, HDB++ should be used

alarms are configured in attribute properties

- One property per alarm property
- Can be modified offline
- Need ReLoadAll command or restart/init of the device to be reloaded → TODO: update configuration via attribute properties watching properties (?)



The screenshot shows the Jive 7.21 interface for configuring the AlarmHandler. The window title is "Jive 7.21 [srv-tango-srf-01:20000] (su pc-scalamera)". The main window displays the configuration for the "hv_kg01_fault" property under the "AlarmHandler" device.

The left pane shows a tree view of the configuration hierarchy:

- Server
- Device
 - Class
 - Alias
 - Att. Alias
 - Property
 - Polling
 - Event
 - Attribute config
 - Pipe config
 - Attribute properties
 - Logging

The right pane shows the "Device attribute properties [alarm/mod/0/hv_kg01_fault]" table:

Property name	Value
enabled	1
formula	{kg01/mod/hv/voltageset > 5 && kg01/mod/hv/voltage < 1}
group	gr_ctrl
message	FAULT Mod 1: VoltageSet > 5 and Voltage < 1
off_command	
off_delay	0
on_command	
on_delay	120
priority	high
shlvd_time	-1
tag	hv_kg01_fault

a dynamic attribute for each alarm

- Client interested in a specific alarm can subscribe its events (GUI, HDB++, other AlarmHandlers, notifier proxies)
- Alarm quality/exception report qualities/exceptions of attributes in the formula (so a device not running is visible in the alarm)
- Need to change naming scheme:
 - Old
 - device name was not meaningful and alarm name was *x/y/z/k* with often *x/y/z* name of the device which the alarm refers to
device=*f/alarm/alarm_f*, alarm=*bc01/power_supply/psb_bc01.01/fault*
 - One alarm device can contain all alarms
 - New
 - device name has to be meaningful and alarm name cannot contain '/' since it's an attribute
device=*alarm/power_supply/0*, alarm=*psb_bc01.01_fault*
 - It's reasonable to have one or more alarm devices per group of alarms
alarm/power_supply/linac, *alarm/power_supply/uh*, ...
alarm/diagnostics/fermi
alarm/climate/0, *alarm/climate/1*, ...

alarm attributes are of DevEnum type (IEC 62682:2014)

NORM	Normal alarm state	Normal process condition	Acknowledged	Enabled
UNACK	Unacknowledged alarm state	Abnormal process condition	Unacknowledged	Enabled
ACKED	Acknowledged alarm state	Abnormal process condition	Acknowledged	Enabled
RTNUN	Returned to normal alarm state	Normal process condition	Unacknowledged	Enabled
SHLVD	Shelved state	Normal or abnormal process condition	Not applicable	Temporarily disabled
DSUPR	Suppressed by design state	Normal or abnormal process condition	Not applicable	Disabled
OOSRV	Out of service alarm state	Normal or abnormal process condition	Not applicable	Disabled

- Shelve command → alarm state remain SHLVD for shlvd_time (configured per alarm)
- Disable command → alarm state changed to OOSRV state until Enable command is called
- ERROR state → at least one of the attribute in the formula is in exception, or formula cannot be parsed

alarmSummary + GetAlarmInfo

- alarmSummary attribute returns an array of tag, state, priority, time, formula, message for each alarm in key=value; format

```
tag=pdu_rc_kg01_01_temperature;state=NORM;priority=high;time=2020-10-06  
15:47:36.651265;formula=(...);message=Temperature out of range
```

- GetAlarmInfo command returns all properties of a given alarm or just the ones specified as parameter

```
[0] tag=pdu_rc_kg01_01_temperature  
[1] state=NORM  
[2] formula=((kg/pdu/pdu-rc-kg01-01/temperature < 20.0 || kg/pdu/pdu-rc-kg01-01/temperature >  
29.0) && kg/pdu/pdu-rc-kg01-01/temperature > 0 && 0)  
[3] values={"kg/pdu/pdu-rc-kg01-01/temperature":23,"kg/pdu/pdu-rc-kg01-01/  
temperature":23,"kg/pdu/pdu-rc-kg01-01/temperature":23}  
[4] quality=ATTR_VALID  
[5] enabled=1  
[6] shelved=0  
[7] ack=1  
[8] audible=1  
[9] counter=1  
[10] freq_counter=1
```

...

AlarmHandler

AlarmManager

- A device where to collect state/statistics from many AlarmHandlers
- A device to ease configuration: every property of an alarm has an attribute to be filled (instead of writing attribute properties of an AlarmHandler or passing a string with a key=value; list to the AlarmHandler command Load)
- Maybe a useless complication and redundant when there will be a GUI ?

Alarm history and HDB++

- No dedicated DB for alarm history, HDB++ should be used
 - Should GUI or AlarmManager (or ?) automatically archive with HDB++ when loading new alarms ?
 - Should also others attribute in the formula automatically be archived ?

PANIC

- Should be able to read alarm status from AlarmHandlers through alarmSummary+GetAlarmInfo
- Should be able to load new alarms in AlarmHandler attribute properties

PANIC Alarm Panel (*): 2017-09-14 09:56:38 (on controls02)

BL29 STATES	BL29_PRIMARY WATER_ILK	BL29_PRESSURE FE	BL29_PRESSURE 5	BL29_PRESSURE 4	BL29_PRESSURE 3	BL29_PRESSURE 2	BL29_PRESSURE 1
BL29_MONO PNTM_PRESSURE INTERLOCK	BL29_IPCT SWITCH TO_OFF	BL29_IPCT OFF	BL29_EPS WARNING	<ul style="list-style-type: none"> See Alarm Details Preview Formula/Values View History Change Severity Reset Alarm(s) Acknowledge/Relenounce Alarm(s) Disable/Enable Alarm(s) 		BL29_BK PRESSURE	BL29_BK_ELOTECH TEMPERATURES
BL29_BK COMMS LOST	BL29 refill	BL29_PRESSURE HECTOR	BL29_MONO PNTM_PRESSURE WARNING			BL29_BK START	PANIC

PANIC

PANIC 6.4.0 (*/*/[*~*(building|bake)*]@alba03) (on ctdevelsa)

File Tools Help View

Sort: State

State

Filter: Update Save As

ShowActive Only SelectAll/None

▲	LT_DI_SCO01_LOST	-	UNACK	-	2017-09-26 09:13:44	-	mach/alarm/ccds-01	-	Ac
▲	RADIATION_WARNING	-	UNACK	-	2017-09-26 09:57:10	-	sr/pss/alarms	-	Re
▲	LT_DI_SCO01_FAULT	-	UNACK	-	2017-09-26 09:13:42	-	mach/alarm/ccds-01	-	17
▲	BO_VC	-	UNACK	-	2017-09-26 09:13:24	-	bo/vc/alarms	-	Pr
!	LT_DI_SCO01_DISABLED	-	UNACK	-	2017-09-26 09:13:54	-	mach/alarm/ccds-01	-	se
!	TIMING_RHB	-	UNACK	-	2017-09-26 09:13:41	-	al/ti/alarms	-	Re
!	TIMING_MASTER_ALARM	-	UNACK	-	2017-09-26 09:13:35	-	al/ti/alarms	-	Ve
!	TIMING_HB	-	UNACK	-	2017-09-26 09:13:29	-	al/ti/alarms	-	He
!	EPS_CCG_VC_VALUES_DIFFER	-	UNACK	-	2017-09-26 09:13:21	-	sr/eps/alarms-02	-	Co
!	BEEP_TEST	-	UNACK	-	2017-07-25 15:05:52	-	mach/alarm/beep-alarm	-	Te
!	ARCHIVING02	-	ACKED	-	2017-09-26 09:13:39	-	archiving/alarms/1	-	ar
!	SCW_CryocoolerCoolerError	-	NORM	-	2017-09-26 11:36:53	-	id04/ct/alarms	-	Su
!	SCW_InterlockQuench	-	NORM	-	2017-09-26 11:36:53	-	id04/ct/alarms	-	In
!	MIRAS_temp_updown	-	NORM	-	2017-09-26 11:36:53	-	sr/eps/alarms-fast	-	M
!	MIRAS_mirrorIN_MPSnotSafe	-	NORM	-	2017-09-26 11:36:53	-	sr/eps/alarms-fast	-	M
!	MIRAS_temp_warning_last5	-	NORM	-	2017-09-26 11:36:53	-	sr/eps/alarms-delta	-	M
!	MIRAS_temp_warning	-	NORM	-	2017-09-26 11:36:53	-	sr/eps/alarms-delta	-	M
!	BadOrbit	-	NORM	-	2017-09-26 11:36:53	-	sr/bd/alarms	-	Be
!	BEAM_LOST	-	NORM	-	2017-09-26 11:36:53	-	sr/bd/alarms	-	Be



AlarmHandler



Idea ?

Sequencer - srv-tango-srf-01:20000 - seq/recover/ic

Master List

Tree View Node View seq/recover/ic seq/recover/ic

Device	State	Last Exec	Elapsed	Description
seq/recover/ic	RUNNING	5d 17h 2m	177	Recover automatically Ionization Chambers
seq/recover/ic fel01.01	RUNNING	unavailable	4307829	Start automatic recover of fel01/mps/ic fel01.0...
mbd/diagnostics/rtcm mbd.01	ON			
fel01/mps/ic fel01.01	ON			
uh/pdu/pdu-t-fel01-01	ON			
tango/admin/ec-mps-usa-01	ON			
seq/recover/ic iufel01.01	RUNNING	unavailable	4307829	Start automatic recover of iufel01/mps/ic iufel...
seq/recover/ic iufel01.02	RUNNING	unavailable	4307829	Start automatic recover of iufel01/mps/ic iufel...
seq/recover/ic iufel01.03	RUNNING	unavailable	4307828	Start automatic recover of iufel01/mps/ic iufel...
seq/recover/ic iufel01.04	RUNNING	unavailable	4307828	Start automatic recover of iufel01/mps/ic iufel...
seq/recover/ic iufel01.05	RUNNING	unavailable	4307827	Start automatic recover of iufel01/mps/ic iufel...
seq/recover/ic iufel01.06	RUNNING	unavailable	4307826	Start automatic recover of iufel01/mps/ic iufel...
seq/recover/ic sfel01.01	RUNNING	unavailable	4307826	Start automatic recover of sfel01/mps/ic sfel01...
seq/recover/ic fel02.01	RUNNING	unavailable	4307826	Start automatic recover of fel02/mps/ic fel02.0...
seq/recover/ic fel02.02	RUNNING	unavailable	4307825	Start automatic recover of fel02/mps/ic fel02.0...
seq/recover/ic fel02.03	RUNNING	unavailable	4307825	Start automatic recover of fel02/mps/ic fel02.0...
seq/recover/ic iufel02.01	RUNNING	unavailable	4307824	Start automatic recover of iufel02/mps/ic iufel...
seq/recover/ic iufel02.02	RUNNING	unavailable	4307824	Start automatic recover of iufel02/mps/ic iufel...
seq/recover/ic iufel02.03	RUNNING	unavailable	4307823	Start automatic recover of iufel02/mps/ic iufel...
seq/recover/ic iufel02.04	RUNNING	unavailable	4307822	Start automatic recover of iufel02/mps/ic iufel...
seq/recover/ic iufel02.05	RUNNING	unavailable	4307822	Start automatic recover of iufel02/mps/ic iufel...
seq/recover/ic iufel02.06	RUNNING	unavailable	4307822	Start automatic recover of iufel02/mps/ic iufel...
seq/recover/ic iufel02.07	RUNNING	unavailable	4307821	Start automatic recover of iufel02/mps/ic iufel...
seq/recover/ic iufel02.08	RUNNING	unavailable	4307821	Start automatic recover of iufel02/mps/ic iufel...
seq/recover/ic sfel02.01	RUNNING	unavailable	4307819	Start automatic recover of sfel02/mps/ic sfel02...

Refreshed a subset of 74 sources over 126 in 1 milliseconds cumbia ▾