ALBA: EXTENDING ALARM HANDLING IN TANGO

Panic Application

Notifications

GUI

SMS

Log

Email

WEB

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What an Alarm System should do

An Alarm system is needed to notify any important incidence in the control system, but also to keep a continuous feedback of machine and beamlines operation.

Logging and notification of changes in operation conditions may prevent problems before they occur.

Our requirements were focused on having a reliable notification service, capable of logging and absolutely integrated in our control system.

Although two alarm logging systems already existed in Tango as independent tools, at ALBA we preferred to integrate alarms in the existing applications. To develop our own alarm system we borrowed as much as possible from the existing systems.

Tango Alarm Systems

The Tango Alarm System
The Tango Alarm System [5] was developed at Elettra institute by Graziano Scalamera and Lorenzo Pivetta. It uses a MySQL alarm database containing sets of rules that are permanently checked by a central daemon, the Tango Alarm Server. This server logs alarm changes and triggers actions if needed. The rules are combinations of boolean operators and Tango Attribute values.

Soleil Alarm Database
Soleil has developed an Alarm Database that mimics the behaviour of Tango Archiving System [6], but focused on storing Attribute Quality (Valid/Invalid/Changing/Warning/Alarm) changes instead of values. The system uses a MySQL database and a pool of Archiver devices polling the quality of those Tango Attributes registered in the Database (events are not supported).

Types of messages

☐ **Alarm**: The alarm condition has been activated.
☐ **Recovered**: Alarm conditions are now inactive, but alarm state is kept.
☐ **Reminder**: When Condition is still active for X period or it is active again after a Recovered period.
☐ **Acknowledge**: Alarm has been reset by operator.
☐ **Auto-reset**: Alarm has been reset after being in Recovered state for a long time.
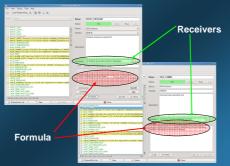
Source of an Alarm

PyAlarm applies python parsing; enabling a richer rule syntax with list comprehensions, regular expressions, string replacement and other functional features.

The source of an alarm comes from:

☐ **Vacuum**
☐ **Temperatures**
☐ **EPS devices**
☐ **Availability of services**
☐ **Any Tango attribute…**

Alarm's Declaration with Panic
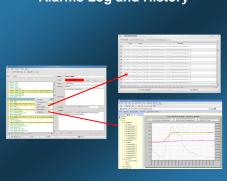
Receivers

Formula

Alarm Life Cycle

In ALBA Alarm system every Alarm requires human acknowledge to be reset. We added additional alarm notifications to avoid alarms being unnoticed. Changes in alarm condition value will trigger Reminder or Recovered emails while it is not acknowledged yet.

Alarm Conditions

Recovered? → Triggering

Reminder → Alarm ← Ack

Alarm Notification

Alarms Log and History

Severities

☐ ALARM
☐ WARNING
☐ DEBUG
☐ ERROR

Alarm Device Properties

Device Properties		
Property name	Property type	Description
LogFile		File where alarms are logged
AlarmThreshold		Min number of consecutive Events/Pollings that must trigger an Alarm
AlertOnRecovery		It can contain 'email' and/or 'sms' keywords to specify if an automatic message must be sent in case of alarm returning to safe level
FlagFile		File where a List of Codes and the status depending of them can be shown or not
PollingPeriod		Periode in ms. in which all attributes not event-driven will be polled
MaxAlarmsPerDay		Max. Number of Alarms to be sent each day for one condition
MaxMessagesPerAlarm		Max. Number of messages to be sent each time that an Alarm is activated/recovered/reset
FromAddress		Address from will appear as Sender of mail and SMS
SMSConfig		Arguments for sendSMS command
SnapConfig		
Reminder		If a number of seconds is set, a reminder mail will be sent while the alarm is still active.
AutoReset		If a number of seconds is set, the alarm will reset if the conditions are no longer active after the given interval.

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