HDB++ - AlarmHandler Integration @Elettra

Graziano Scalamera

HDB++ - AlarmHandler

What are “Alarms”

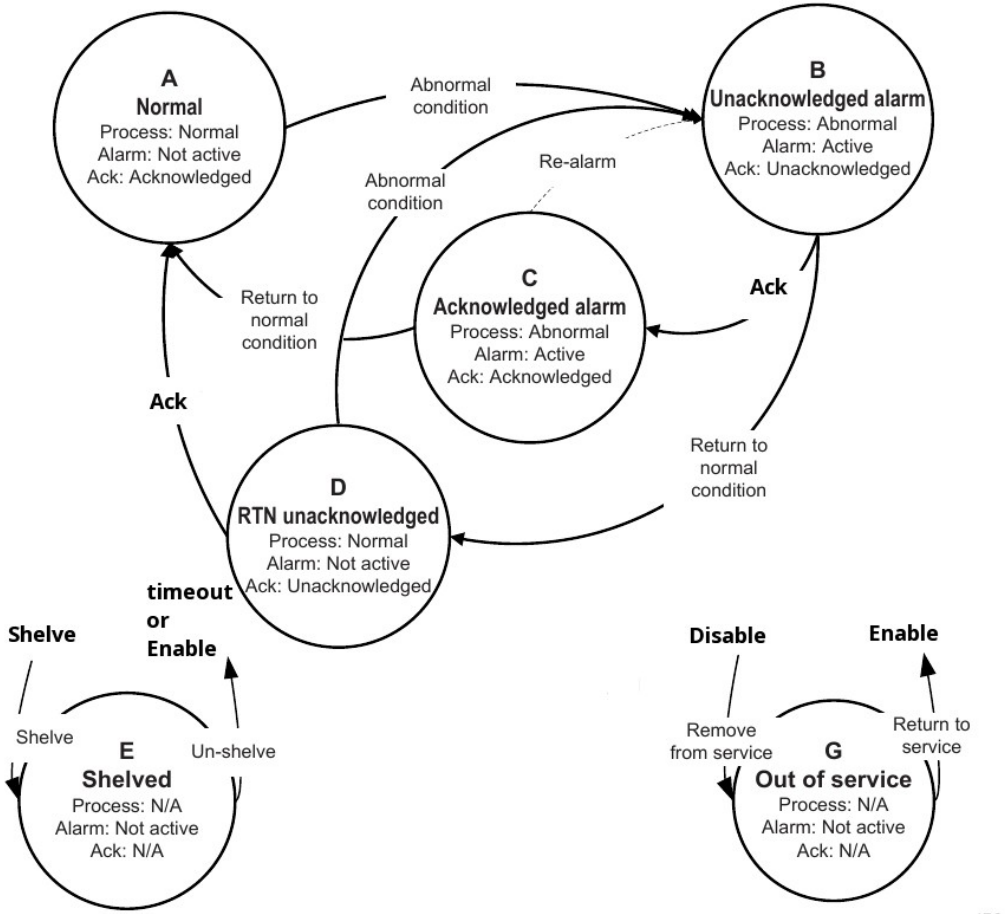
- Each Alarm is an attribute of DevEnum type
- Alarm values are: NORM, UNACK, ACKED, RTNUN, SHLVD, DSUPR, OOSRV, ERROR (**IEC 62682**)
- Alarm attributes push change and archive events at each variation

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

HDB++ - AlarmHandler

What are “Alarms”

- Each Alarm is an attribute of DevEnum type
- Alarm values are: NORM, UNACK, ACKED, RTNUN, SHLVD, DSUPR, OOSRV, ERROR (**IEC 62682**)
- Alarm attributes push change and archive events at each variation



HDB++ - AlarmHandler

Deployement in Elettra and Fermi

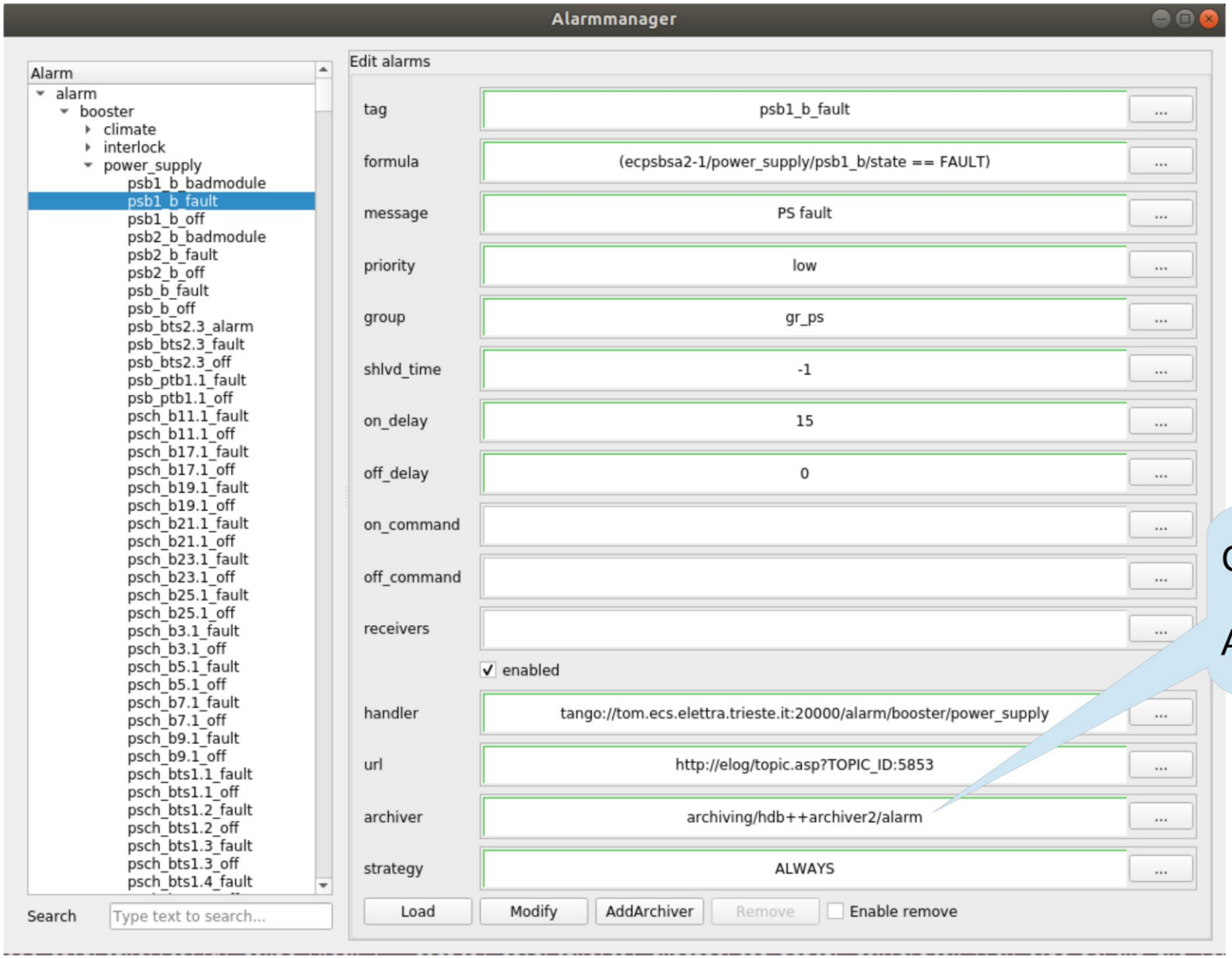
ELETTRA

- **26** alarm-handler devices
- **1224** alarm rules managed by Control Room GUI
- **7** alarm rules sending only email notifications

FERMI

- **22** alarm-handler devices
- **897** alarm rules managed by Control Room GUI
- **415** alarm rules sending only email notifications

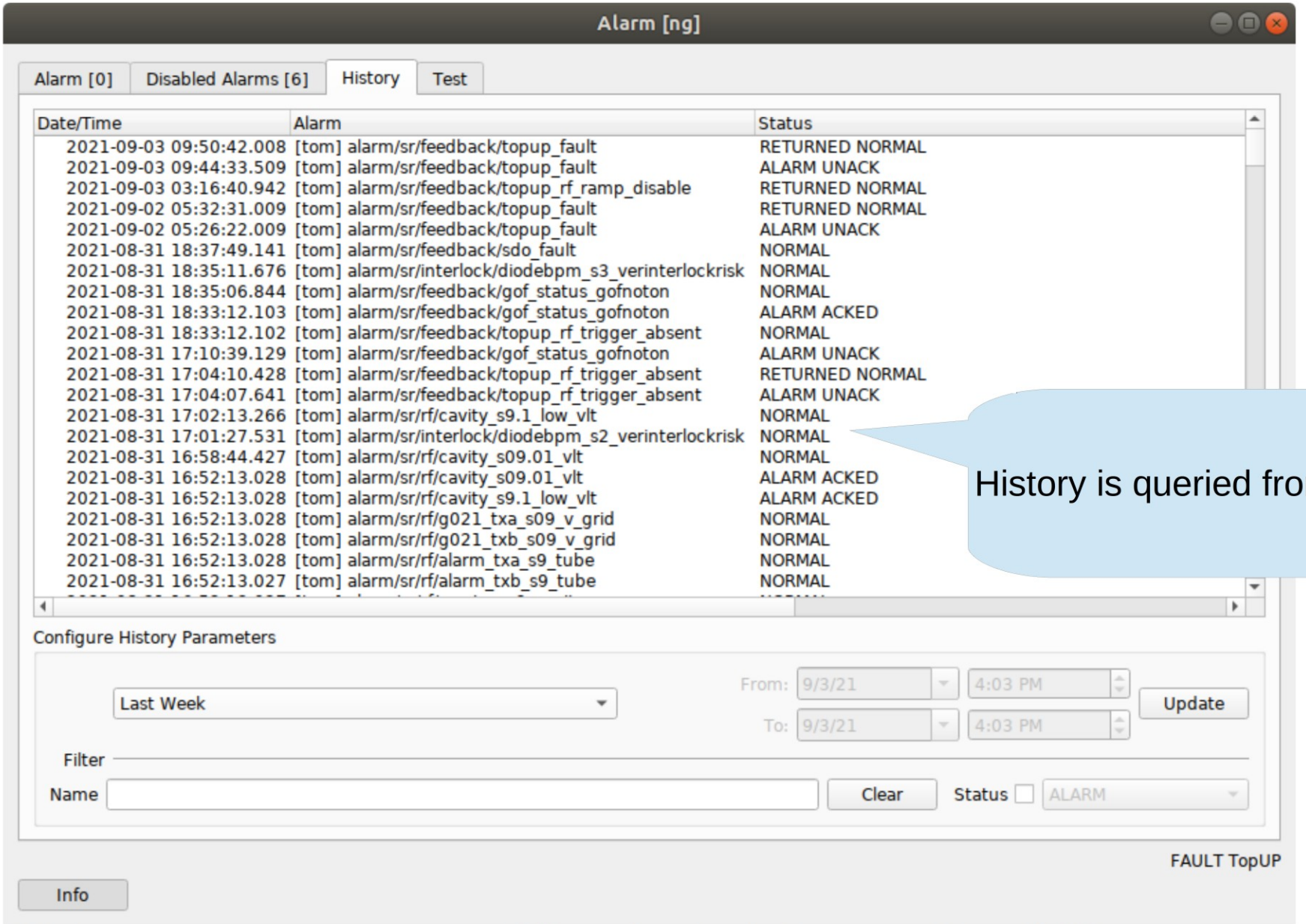
HDB++ - AlarmHandler
AlarmManager GUI



Configure archiving of alarms from AlarmManager GUI

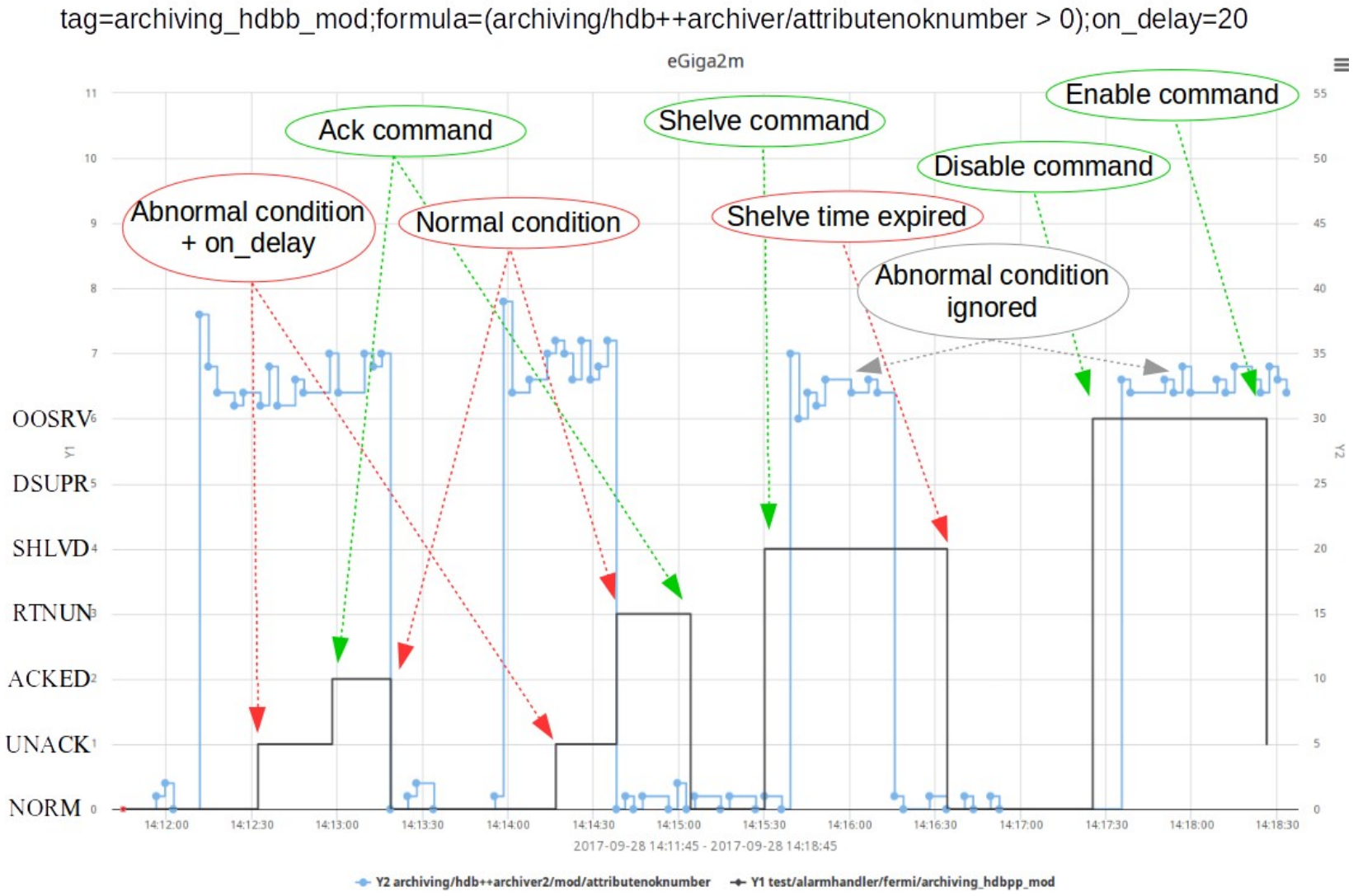
HDB++ - AlarmHandler

Alarm-ng GUI



HDB++ - AlarmHandler

Correlate alarm state and attribute values with Egiga



HDB++ - AlarmHandler

DevEnum support

- Numeric value is stored in att_scalar_devenum_ro
- Enum label value is stored in att_parameter only when it changes

```
CREATE TABLE `att_scalar_devenum_ro` (
  `att_conf_id` int(10) unsigned NOT NULL,
  `data_time` datetime(6) NOT NULL,
  `recv_time` datetime(6) NOT NULL,
  `value_r` smallint(6) DEFAULT NULL,
  `quality` tinyint(1) DEFAULT NULL,
  `att_error_desc_id` int(10) unsigned DEFAULT NULL,
  PRIMARY KEY (`att_conf_id`,`data_time`)
);
```

HDB++ - AlarmHandler

DevEnum support

- Numeric value is stored in att_scalar_devenum_ro
- Enum label value is stored in att_parameter only when it changes

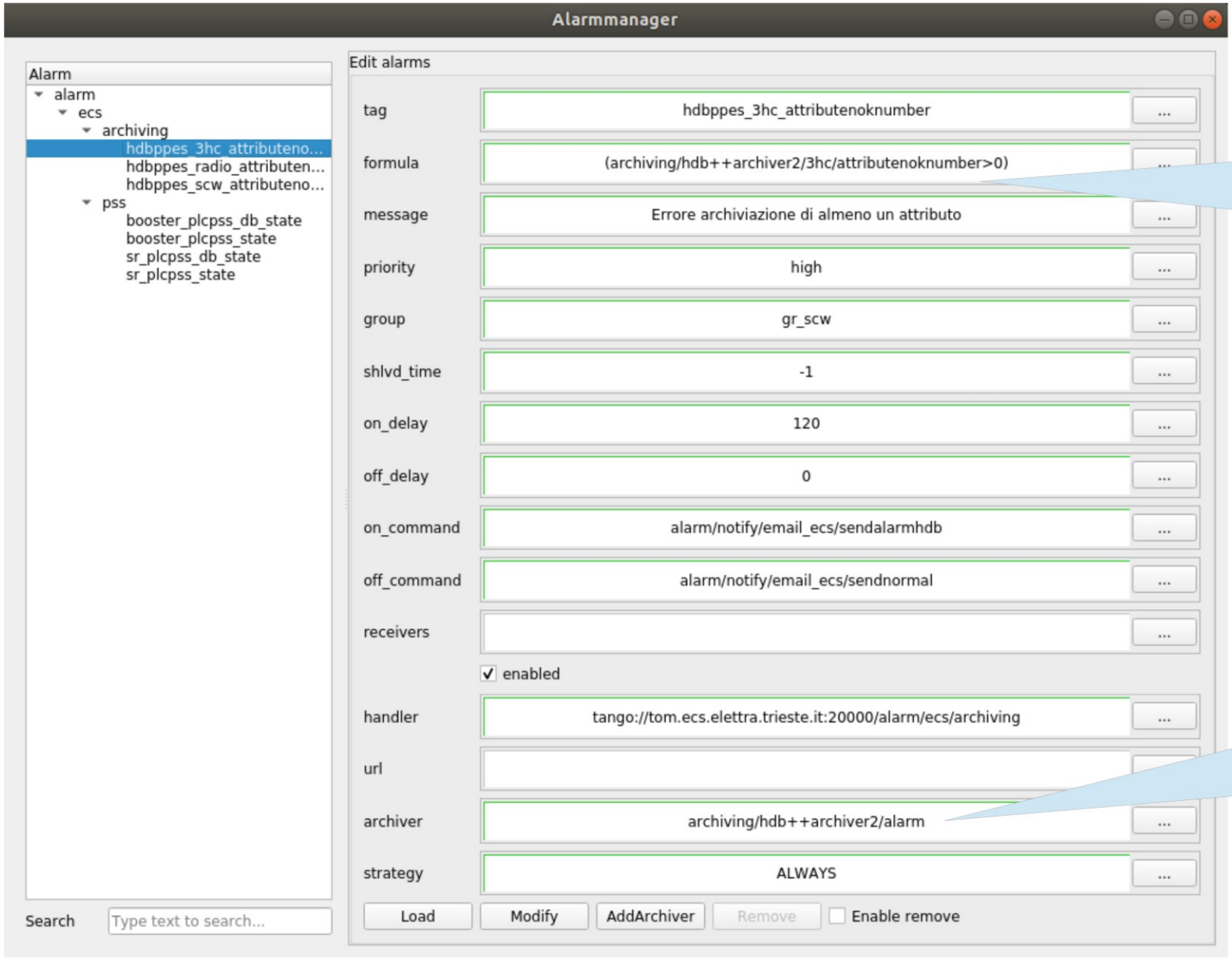
```
CREATE TABLE `att_parameter` (
  `att_conf_id` int(10) unsigned NOT NULL,
  `recv_time` datetime(6) NOT NULL,
  `label` varchar(255) NOT NULL DEFAULT '',
  `unit` varchar(64) NOT NULL DEFAULT '',
  `standard_unit` varchar(64) NOT NULL DEFAULT '1',
  `display_unit` varchar(64) NOT NULL DEFAULT '',
  `format` varchar(64) NOT NULL DEFAULT '',
  `archive_rel_change` varchar(64) NOT NULL DEFAULT '',
  `archive_abs_change` varchar(64) NOT NULL DEFAULT '',
  `archive_period` varchar(64) NOT NULL DEFAULT '',
  `description` varchar(1024) NOT NULL DEFAULT '',
  `enum_labels` json NOT NULL,
  PRIMARY KEY (`att_conf_id`,`recv_time`)
);
```

HDB++ - AlarmHandler
DevEnum support

- Not possible to address JSON array element from a column value in MySql 5.7
- Egiga joins the two queries at application level
- alarm-ng-gui hardcodes label in the query:

```
SELECT asd.data_time AS 'Date/Time',ac.att_name AS 'Alarm',
COALESCE(
REPLACE(REPLACE(REPLACE(REPLACE(REPLACE(REPLACE(asd.value_r
 ,'0','NORMAL')
  ,'1','ALARM UNACK')
   ,'2','ALARM ACKED')
    ,'3','RETURNED NORMAL')
     ,'4','SHELVED')
      ,'6','DISABLED'),aed.error_desc) AS 'Status'
FROM hdbpp.att_scalar_devenum_ro asd JOIN hdbpp.att_conf ac
 ON asd.att_conf_id=ac.att_conf_id LEFT OUTER JOIN
  att_error_desc aed
 ON aed.att_error_desc_id=asd.att_error_desc_id
WHERE ac.att_name in (SELECT att_name FROM hdbpp.att_conf
WHERE att_name LIKE '%alarm/test/demo/%' ) AND
 DATE(asd.data_time) > DATE_SUB(CURRENT_DATE(),INTERVAL 1
 DAY) ORDER BY asd.data_time DESC;
```

HDB++ - AlarmHandler
Archiving of alarms on archiver status



Configure alarms on hdb++es archiver status

Archive (with a different) hdb++es archiver

HDB++ - AlarmHandler

Questions ?