PAUL SCHERRER INSTITUT

PSI

Felix Armborst on behalf of the Operations Team

Alarm handling for the Accelerators at PSI

European XFEL visit to PSI, November 14th, 2023

Outline

I. The alh

1. Overview
2. Received Questions for this workshop
3. Configuration Workflow

II. PSI alh extensions

1. Overview
2. Alarm Logging Server
3. Operation Event Logging System
4. Operator Shift Protocol Tool
5. ELOG: Tracking Bridged Alarms
6. ELOG: Piquet Lists

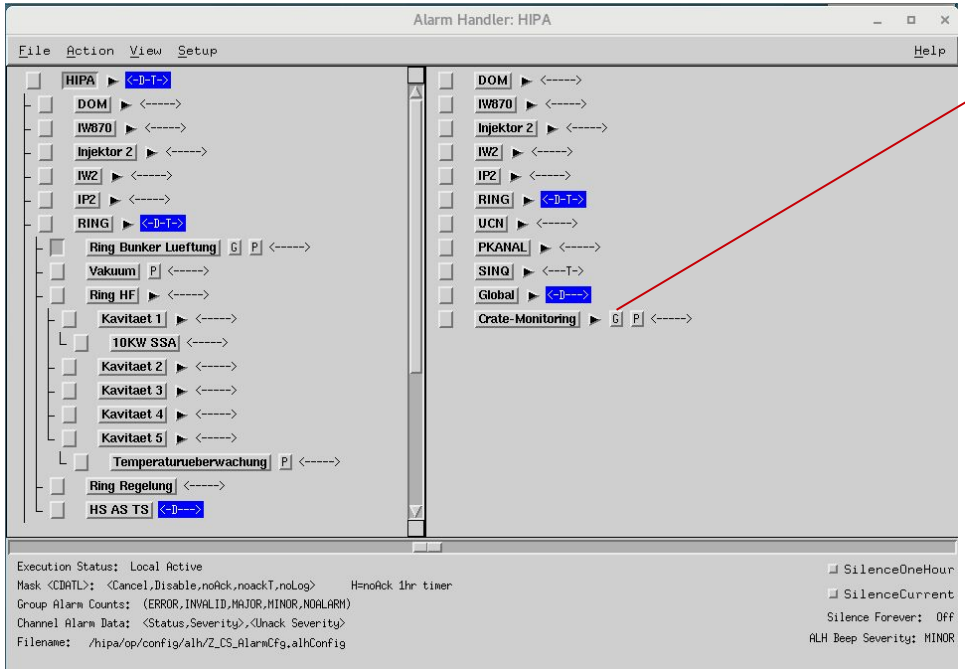
The alh - Overview

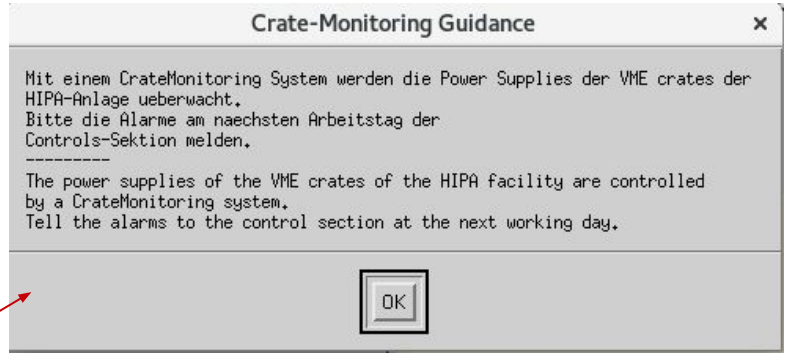
- **The alh provides**
  - acoustic and visual indicators
  - guidances
  - shortcuts to related panels
  - acknowledgment of warnings/alarms by operator
  - possibility to modify mask settings of groups of or individual alarms

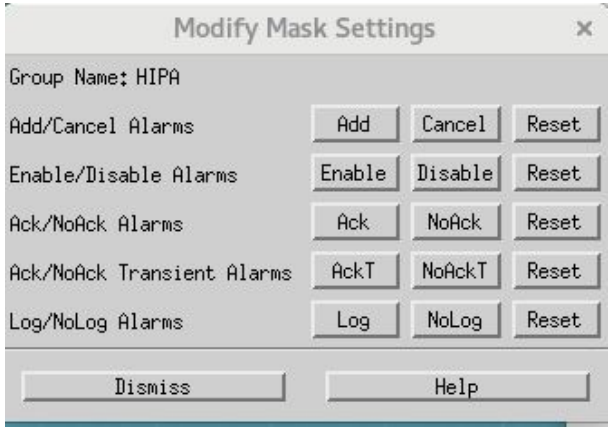
- **Missing / Solved otherwise**
  - Persistent and documented Alarm bridging →elog, operator, helpertools (e.g., SchichtProtokollTool)
  - Persistent, failsafe / multi-user / multi-instance Logging →logging server + scraper scripts
  - Downtime Logging / Information

- **Some of the general downsides**
  - Outdated X-Motif
  - Last update August 2014 → No bugfixes, no support, no security (patches)

The alh - Overview







The alh - Received Questions for this workshop

- **what types of events are supported?**
  - EPICS events
    - MAJOR Alarm (i.e., HIHI or LOLO)
    - MINOR Alarm / Warning (i.e., HIGH or LOW)
    - Invalid (e.g. defective hardware, out-of-valid-range, …)
    - Error (PVs disconnected)
- **how are people notified?**
  - Acoustic and visual indications for the operators in the control room
  - Telephone call from the operators to the corresponding expert group / piquet
- **how are alarms acknowledged?**
  - With a click from the operator
- how is the alarm handler configured
  - See slide 7

The alh - Configuration Workflow

- Chain of Command
  - Alarm Definitions (Expert Groups and Operations) → Merge Requests
  - Config File on Git (Machine Responsible from Controls) → Quality Control
  - Git Auto-Deployment (Simon Rees, Rene Kappeller)
  - User (Operations)
- SLS
  - Andreas Luedeke, Felix Armborst
  - Renata
- PROSCAN
  - Stephan Maeder
  - Hubert
- SwissFEL
  - Christoph Kittel, Didier Voulot
  - N/A
- HIPA
  - Thomas Marder
  - Hubert

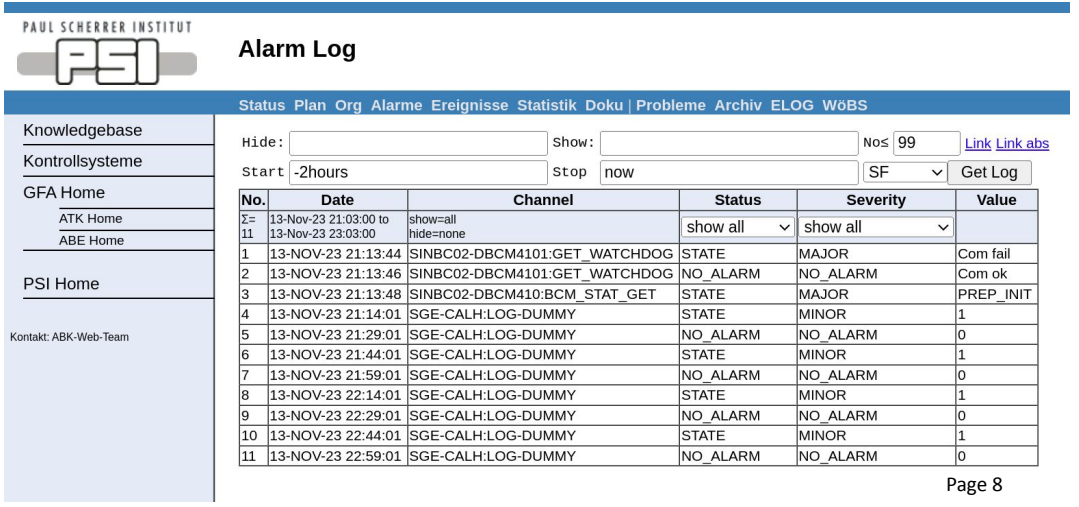
See also the “SwissFEL alarm handler policy” on indico for further information

PSI alh extensions - Overview

- Logging (mostly part of the extension package)
- Only one alh instance per machine is allowed to write to oracle, others write to file
- Individual sound for each machine (4 facilities handled by one group of operators!)
- Various wrappers
- Operator tools for
  - Piquet lists
  - Persistent and tracked bridging of alarms
- …

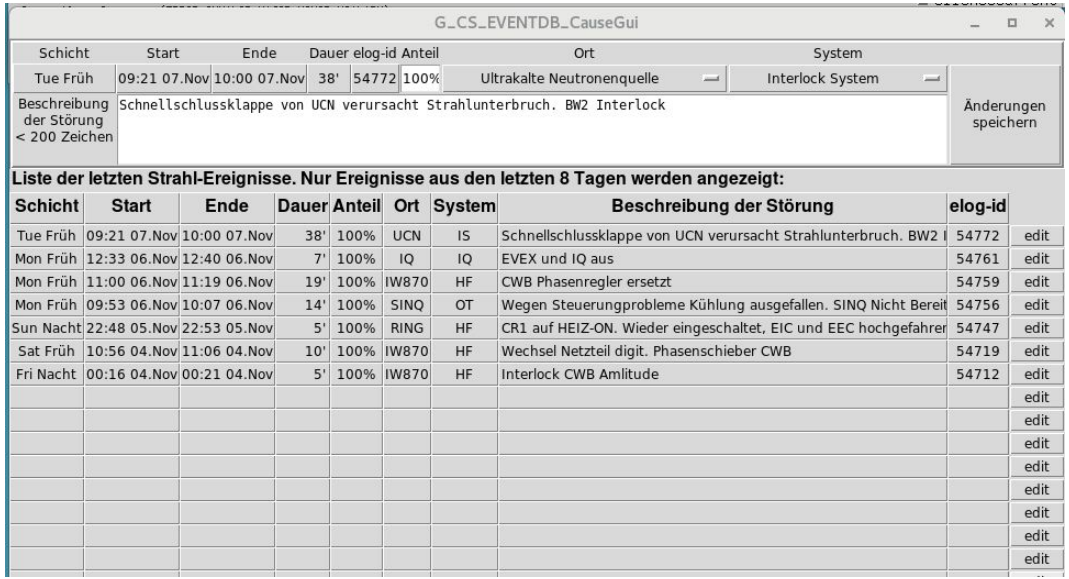
PSI alh extensions - Alarm Logging Server

- Server receives alarms of each machine (local msgqueue + tcp2oracle)
- All alarms stored in relational database
- Web service (intranet) to browse and filter alarm logs:
  - https://gfa-operation.intranet.psi.ch/alh/?fac=SLS
  - https://gfa-operation.intranet.psi.ch/alh/?fac=HIPA
  - https://gfa-operation.intranet.psi.ch/alh/?fac=Proscan
  - https://gfa-operation.intranet.psi.ch/alh/?fac=SF



No.	Date	Channel	Status	Severity	Value
Σ= 11	13-Nov-23 21:03:00 to 13-Nov-23 23:03:00	show=all hide=none	show all	show all	
1	13-NOV-23 21:13:44	SINBC02-DBCM4101:GET_WATCHDOG	STATE	MAJOR	Com fail
2	13-NOV-23 21:13:46	SINBC02-DBCM4101:GET_WATCHDOG	NO_ALARM	NO_ALARM	Com ok
3	13-NOV-23 21:13:48	SINBC02-DBCM410:BCM_STAT_GET	STATE	MAJOR	PREP_INIT
4	13-NOV-23 21:14:01	SGE-CALH:LOG-DUMMY	STATE	MINOR	1
5	13-NOV-23 21:29:01	SGE-CALH:LOG-DUMMY	NO_ALARM	NO_ALARM	0
6	13-NOV-23 21:44:01	SGE-CALH:LOG-DUMMY	STATE	MINOR	1
7	13-NOV-23 21:59:01	SGE-CALH:LOG-DUMMY	NO_ALARM	NO_ALARM	0
8	13-NOV-23 22:14:01	SGE-CALH:LOG-DUMMY	STATE	MINOR	1
9	13-NOV-23 22:29:01	SGE-CALH:LOG-DUMMY	NO_ALARM	NO_ALARM	0
10	13-NOV-23 22:44:01	SGE-CALH:LOG-DUMMY	STATE	MINOR	1
11	13-NOV-23 22:59:01	SGE-CALH:LOG-DUMMY	NO_ALARM	NO_ALARM	0

PSI alh extensions - Operation Event Logging System



- Used for SLS, HIPA und SwissFEL
- Rules defining "Events" are easily configurable and arbitrary amount of events can be defined
- Easily adjustable for different control systems
- A. Lüdeke, “Operation event logging system of the Swiss Light Source”, https://link.aps.org/doi/10.1103/PhysRevSTAB.12.024701

PSI alh extensions - Operator Shift Protocol Tool

- Shortcuts for
  - Predefined ELOG entries, e.g., startup or shutdown
  - Piquet lists
  - Currently bridged alarms
  - Currently active tasks
  - …

PSI alh extensions - ELOG: Piquet Lists

Operation | Development | Beamlines | Service | Groups | ELOG
SLS | SwissFEL.. | Proscan | Hipa.. | GLS | Pikett | Op.Org..

Pikett, Seite 1 von 1 — Nicht eingeloggt — ELOG-GFA

Finden | Anmelden | Hilfe

Anlage: HIPA
Woche: 45

zusammengefasst | mit Antwortketten — -- Gruppe -- | HIPA | 45 | -- Jahr -- — 18 Einträge

Gruppe	Anlage	Woche	Jahr		Notiz	Zeitraum
Hallendienst	HIPA|SLS|Proscan	KW 45	2022	Mo-Mo: Herma		Mon 07-Nov - 13-Nov-22 KW45, Regeln
Kryogene Anlagen	HIPA|SLS|Proscan	KW 45	2022	Daniel Deak		Mon 07-Nov - 13-Nov-22 KW45, Regeln
Prozesskühlung	HIPA|SLS|Proscan|SwissFEL	KW 45	2022	Mo-Fr: Silva Fr-Mo: Marti		Mon 07-Nov - 13-Nov-22 KW45, Regeln
SINQ/UCN	HIPA	KW 45	2022	Mo-Fr: Bertr Fr-Mo: Rene		Mon 07-Nov - 13-Nov-22 KW45, Regeln
SU-West	HIPA|SLS|Proscan	KW 45	2022	Mo-Fr: André Fr-Mo: Frede		Mon 07-Nov - 13-Nov-22 KW45, Regeln
Speisegeräte	HIPA|SLS|Proscan|SwissFEL	KW 45	2022	Mo-Mo: Duss		Mon 07-Nov - 13-Nov-22 KW45, Regeln
p-Controls	HIPA|Proscan	KW 45	2022	Mo-Do: Valer Do-Mo: Fabia		Mon 07-Nov - 13-Nov-22 KW45, Regeln
p-HF	HIPA|Proscan	KW 45	2022	Mo-Sa: Marku Sa-Mo: Steph		Mon 07-Nov - 13-Nov-22 KW45, Regeln
p-Vakuum	HIPA|Proscan	KW 45	2022	Mo-Fr: Micha Fr-Mo: Pasca		Mon 07-Nov - 13-Nov-22 KW45, Regeln
Hallendienst	HIPA|SLS|Proscan	KW 45	2023	Mo-Mo: Peter		Mon 06-Nov - 12-Nov-23 KW45, Regeln
Kryogene Anlagen	HIPA|SLS|Proscan	KW 45	2023	Axel Tute [+		Mon 06-Nov - 12-Nov-23 KW45, Regeln
Prozesskühlung	HIPA|SLS|Proscan|SwissFEL	KW 45	2023	Mo-Fr: Silva Fr-Mo: Andre		Mon 06-Nov - 12-Nov-23 KW45, Regeln
SINQ/UCN	HIPA	KW 45	2023	Mo-Fr: Pasca Fr-Mo: Bertr		Mon 06-Nov - 12-Nov-23 KW45, Regeln
SU-West	HIPA|SLS|Proscan	KW 45	2023	Mo-Fr: André Fr-Mo: Max H		Mon 06-Nov - 12-Nov-23 KW45, Regeln
Speisegeräte	HIPA|SLS|Proscan|SwissFEL	KW 45	2023	Mo-Mo: Ebi M		Mon 06-Nov - 12-Nov-23 KW45, Regeln
p-Controls	HIPA|Proscan	KW 45	2023	Mo-Mo: Janis		Mon 06-Nov - 12-Nov-23 KW45, Regeln
p-HF	HIPA|Proscan	KW 45	2023	Mo-Mo: Andre		Mon 06-Nov - 12-Nov-23 KW45, Regeln
p-Vakuum	HIPA|Proscan	KW 45	2023	Mo-Fr: Micha Fr-Mo: Marc		Mon 06-Nov - 12-Nov-23 KW45, Regeln

PSI alh extensions - ELOG: Tracking Bridged Alarms

Operation | Development | Beam | priv | Service | Groups | ELOG
SLS | SwissFEL | Proscan | GLS | Pikett | Op.Org.

SLS Operation Log (Admin: A. Lüdeke), Seite 1 von 1 — Nicht eingeloggt — ELOG-GFA

Neu | Finden | Anmelden | Hilfe

Eintrag:	Überbrückung
Effekt:	Aktiv

ausführlich | zusammengefasst | mit Antwortketten | Anhänge verstecken

-- Alle Einträge -- | Überbrückung | -- System -- | Aktiv | -- auto -- | 10 Einträge

Wann	Titel	Autor	Eintrag	Effekt	System	ID	auto
Fri 15-Sep-23 17:07	ARIDI-BPM-06MD:OFB-STAT	Mäder, Armborst, Thomsen, Hottinger	Überbrückung	Aktiv	Diagnostik	59108	no

Kanal:	ARIDI-BPM-06MD:OFB-STAT
Pfad:	ACCELERATOR / / /RING/Ring Diagnostic/ARIDI_OFBn/ARIDI-BPM_OFB-STAT/ARIDI-BPM-06_OFB_STAT
Grund:	Ausfall vom BPM-06MD. Wird repariert am nächste MD.

Thu 14-Sep-23 14:41	Ventilatorproblem ARIRF-VME-A1B	Mäder, Hottinger, Thomsen, Kittel	Überbrückung	Aktiv	Controls	58798	no

Kanal:	Ventilatorproblem ARIRF-VME-A1B
Pfad:	ACCELERATOR / / / Global Alarms / VME Crate Power Supplies / canbus, 1.Ast / ARIRF-VME-A1B
Grund:	bis Darktime oder wenn es einen Langen unterbruch am Tag gibt

Thu 31-Aug-23 08:32	ARIMA-CBE:PS-MODE disabled	Mäder, Lehmann, Lüdeke	Überbrückung	Aktiv		58794	no

Kanal:	ARIMA-CBE:PS-MODE
Pfad:	ACCELERATOR / RING / Ring Magnets / ARIMA-CB / ARIMA-CB_PS-MODE
Grund:	PS defekt, bleibt DISABLED bis auf Weiteres.

Fri 25-Aug-23 23:32	X09LA-ID nicht in Betrieb	Barchetti, Hottinger, Holliger	Überbrückung	Aktiv	Frontends	58619	no

Kanal:	X09LA-ID -> Read Value , Compare Set Read , Power Supply Mode
Pfad:	ACCELERATOR / / /Ring/Ring Insertion Devices/X09LA-ID
Grund:	nicht in Betrieb -> disconnected -> broken Link

Mon 21-Aug-23 22:17	X09LA-FE-PI2:TC1/2	Marder, Lehmann, Lüdeke	Überbrückung	Aktiv	Frontends	58438	no

Kanal:	X09LA-FE-PI2:TC1 und X09LA-FE-PI2:TC2
Pfad:	ACCELERATOR / RING / FE Alarms MIS / X09LA-FE / Photonshutter Freigabe
Grund:	Beamline kaputt, kein Strahl bis zur Darktime

Mon 14-Aug-23 14:17	X06DA-FE-MK1:FLOW_BDUMP disabled	Hiller, Lüdeke, Weilbach	Überbrückung	Aktiv	Frontends	58206	no

Kanal:	X06DA-FE-MK1:FLOW_BDUMP
Pfad:	ACCELERATOR / RING / Ring Beamdump by MIS / X06DA Interlocks / Strahldump / Straldump vom Frontend
Grund:	PX3 wird umgebaut: gelegentlicher Alarm, ohne dass der Strahl verloren geht.

Tue 08-Aug-23 14:17	Output power horizontal MBF Amplifier disabled	Lüdeke, Probst, Füglister, Facchetti, Haller, Weber	Überbrückung	Aktiv	Diagnostik	57977	no

Kanal:	Output power horizontal MBF Amplifier
Pfad:	ACCELERATOR / RING / Ring Diagnostics / Multibunch Feedback / MBF-Ampl /
Grund:	Reperatur wurde verschoben auf unbestimmt

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Thank you for your attention
And thanks to the many colleagues
who provided slides and input
for this presentation
Swiss Light Source