

REMBRANDT - The Remote Beam Instrumentation and Network Diagnosis Tool



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Abstract

REMBRANDT: Mission and Features

Observe and configure distributed DAQ systems.

Reduce trouble-shooting efforts and reaction time.

Beam instrumentation devices and associated data acquisition components for the coming FAIR accelerators will be distributed over a large area and partially installed in inaccessible radiation exposed areas. Besides operation of the device itself, like acquisition of data, it is mandatory to control also the supporting LAN based components like VME/µTCA crates, front-end controllers (FEC), middle ware servers and more. Fortunately many COTS systems provide means for remote control and monitoring using a variety of standardized protocols like SNMP, IPMI or iAMT.

REMBRANDT, the REMote Beam instRumentation And Network Diagnosis Tool, is a Java framework, which allows the authorized user to monitor and control remote systems while hiding the underlying protocols and connection information such as IP addresses, user-IDs and passwords. In addition to monitoring the device state (like voltage and current load), the main features are the remote power switching of the systems and the observation of the FEC's boot process via protocols like reverse telnet or iAMT Serial-Over-LAN. REMBRANDT is designed to be extensible with new protocols.

Monitoring and Control of:

- 24 different DAQ types
- > ca. 1000 channels
- > ca. 400 DAQ systems
- > 17 electronic rooms + many local niches

Remote Actions

Monitoring e.g. Hardware, Fan, Volt/Amp, Temp.

VME

CPU & Crate

μΤCΑ

CPU & MCH

- Power Cycle
- Reset
- Boot Observation console output e.g. PXEboot
- Logging e.g. user access, settings
- Diagnosis e.g. warning, errors

GSI & FAIR Facility www.fair-center.eu SIS100/300 Plasma Physics **Atomic Physics**

Supported Protocols:

- > SNMP (Simple Network Management Protocol): snmp4j libs [1]
- > iAMT SOL (Serial-over-LAN): AMTTERM to JAVA [2]
- > iAMT (INTEL Active Management Technology): JAVA Web-services
- > IPMI (Intelligent Platform Management Interface): VERAX IPMI lib [3]
- > Telnet: Apache Commons Net lib [4]

High Voltage

Systems

Other LAN

Hardware

- > SSH: Jcraft ssh2 lib [5]
- > Ping

Software Architecture

Supported Hardware:

- VME Crate (Wiener, Elma)
- MTCA.4 Crate (NAT MCH)
- > Industry PC (eg. Kontron KISS)
- ➤ High Voltage Systems (ISEG, CAEN)
- NIM Crate (Wiener)
- > Modular CPUs (VME, μTCA)
- > LAN Devices

Complemented by:

- > IP-KVM Switches remote access via USB/VGA/IP
- Terminal Server remote access on consoles (RS232)
- Hardware Database & Barcode System

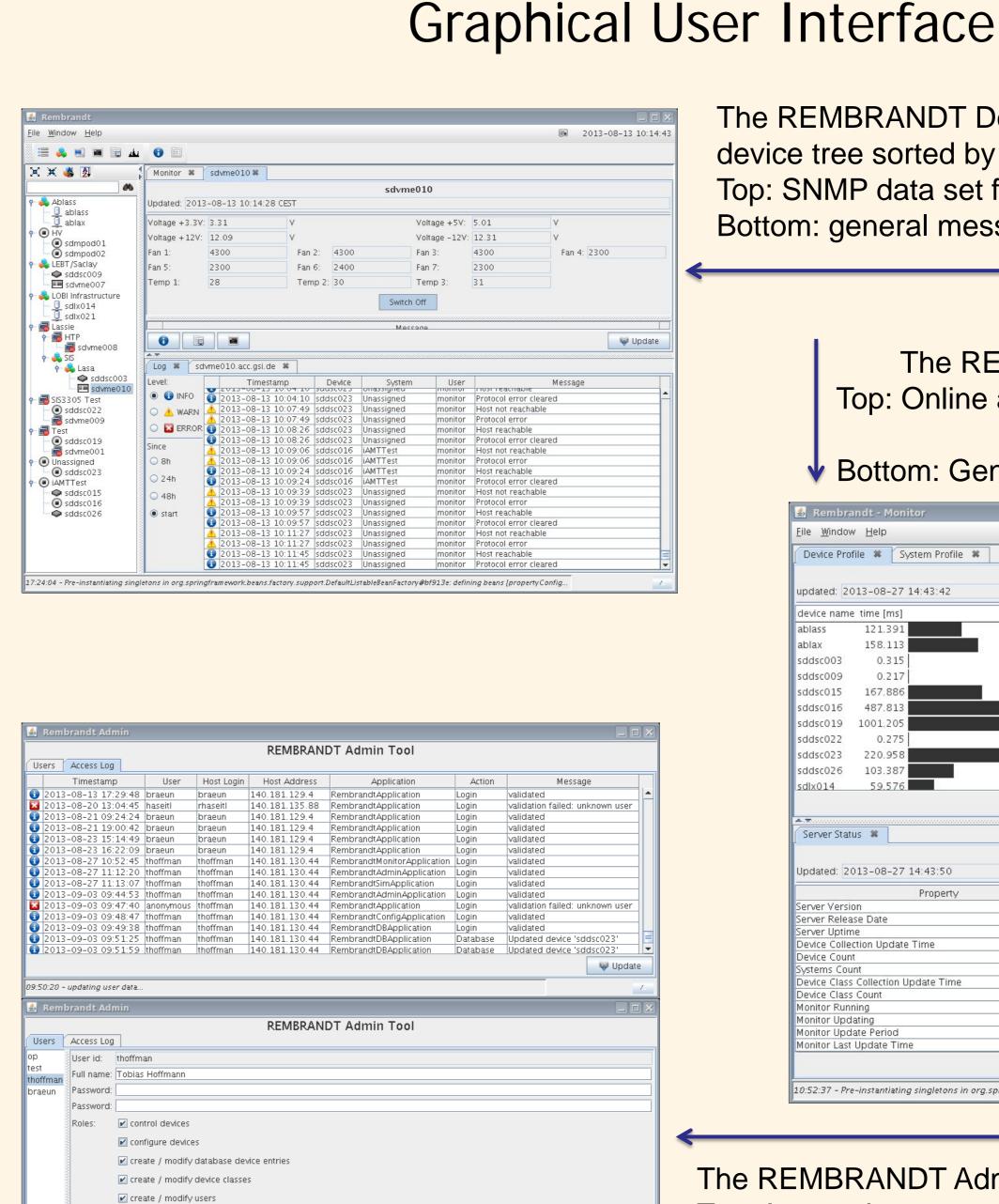
References:

SNMP4J: http://www.snmp4j.org/ amtterm: https://www.kraxel.org/cgit/amtterm/ Verax IPMI Library: Verax Systems http://www.veraxsystems.com Apache Commons Net: http://commons.apache.org/proper/commons-net/ JSch (Java Secure Channel) SSH2 implementation http://www.jcraft.com/jsch/

Client Tier System Information Manager Device Device Administration Configuration Monitor Trouble Changelog Hardware Shooting **Remote Method** Database Database Database Invocation GET, SET, ... **MySQL Database** Monitor - Device-Classes Thread **Device Access** User - Devices Management Single - Users Cron 令 - Logging Thread - Archiving Server Tier LAN IPMI, SNMP, iAMT TELNET, Ping, SSH, etc.

IndustryPC

Data Acquisition Hardware



🙆 Commit 🔀 💠 New User

9:55:20 - updating user data..

The REMBRANDT Device Monitor. Left: device tree sorted by different categories. Top: SNMP data set for a VME crate. Bottom: general message overview.

> The REMBRANDT Server Monitor. Top: Online access time measurements for timeout optimization. Bottom: General server status overview

	Device Access Profile	
updated: 2013-08-27 14:43:42		
device name time [ms]		
ablass 121.391		
ablax 158.113		
sddsc003 0.315		
ddsc009 0.217		
ddsc015 167.886		
ddsc016 487.813		
ddsc019 1001.205		
sddsc022 0.275		
ddsc023 220.958		
ddsc026 103.387		
dlx014 59.576		
22.272.		₩ Update
		- opuate
Server Status *		
	Server Status	
Jpdated: 2013-08-27 14:43:50		
Property	Value	
Property Server Version	Value 1.0.2	
Property	Value	
Property Server Version Server Release Date	Value 1.0.2 2013-06-17	
Property Server Version Server Release Date Server Uptime Device Collection Update Time Device Count	Value 1.0.2 2013-06-17 4d 1:07:07 2013-08-23 13:36:42 19	
Property Server Version Server Release Date Server Uptime Device Collection Update Time Device Count Systems Count	Value 1.0.2 2013-06-17 4d 1:07:07 2013-08-23 13:36:42 19 10	
Property Server Version Server Release Date Server Uptime Device Collection Update Time Device Count Systems Count Device Class Collection Update Time	Value 1.0.2 2013-06-17 4d 1:07:07 2013-08-23 13:36:42 19 10 2013-08-23 13:36:42	
Property Server Version Server Release Date Server Uptime Device Collection Update Time Device Count Systems Count Device Class Collection Update Time	Value 1.0.2 2013-06-17 4d 1:07:07 2013-08-23 13:36:42 19 10	
Property Server Version Server Release Date Server Uptime Device Collection Update Time Device Count Systems Count Device Class Collection Update Time	Value 1.0.2 2013-06-17 4d 1:07:07 2013-08-23 13:36:42 19 10 2013-08-23 13:36:42 10	
Property Server Version Server Release Date Server Uptime Device Collection Update Time Device Count Systems Count Device Class Collection Update Time Device Class Count Monitor Running Monitor Update Period	Value 1.0.2 2013-06-17 4d 1:07:07 2013-08-23 13:36:42 19 10 2013-08-23 13:36:42 10 true false 10s	
Property Server Version Server Release Date Server Uptime Device Collection Update Time Device Count Systems Count Device Class Collection Update Time Device Class Count Monitor Running Monitor Updating	Value 1.0.2 2013-06-17 4d 1:07:07 2013-08-23 13:36:42 19 10 2013-08-23 13:36:42 10 true false	
Property Server Version Server Release Date Server Uptime Device Collection Update Time Device Count Systems Count Device Class Collection Update Time Device Class Count Monitor Running Monitor Update Period	Value 1.0.2 2013-06-17 4d 1:07:07 2013-08-23 13:36:42 19 10 2013-08-23 13:36:42 10 true false 10s	₩ Update
Property Server Version Server Release Date Server Uptime Device Collection Update Time Device Count Systems Count Device Class Collection Update Time Device Class Count Monitor Running Monitor Update Period	Value 1.0.2 2013-06-17 4d 1:07:07 2013-08-23 13:36:42 19 10 2013-08-23 13:36:42 10 true false 10s 2013-08-27 14:43:42	₩ Update

The REMBRANDT Admin Tool. Top: Access log. Bottom: User Management and access rights.

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