ISBN: 978-3-95450-209-7 ISSN: 2226-0358 doi:10.18429/JACoW-ICALEPCS2019-WEPHA120

MANAGEMENT OF THE MicroTCA SYSTEMS AND ITS COMPONENTS WITH A DOOCS-BASED CONTROL SYSTEM

V. Petrosyan†, K. Rehlich, E. Sombrowski, DESY, Hamburg, Germany

Abstract

The extensive management functionality is one of the key advantages of the MicroTCA.4 standard [1]. Monitoring and control of more than 350 MicroTCA crates and thousands of AMC and RTM modules installed at XFEL, FLASH, SINBAD and ANGUS experiments has been integrated into the DOOCS-based [2] control system. A DOOCS middle layer server together with Java-based GUIs - JDDD and JDTool - developed at DESY, enable remote management and provide information about MicroTCA shelves and components. The integrated management includes inventory information, monitoring current consumption, temperatures, voltages and various types of the built-in sensors. The system event logs and collected histories of the sensors are used to investigate failures and issues.

MOTIVATION

The main goal was:

- Monitor basic health of the shelves
- Receive event reports and failure notifications from the boards and other intelligent FRUs
- Manage power, cooling & interconnect resources in the shelves
- Report anomalies
- Take corrective actions when needed
- Retrieve inventory information
- Read sensors and store their values for further investigations

IMPLEMENTATION

The integration of IPMI interface into DOOCS system gives the possibility to monitor and control hundreds of crates and modules during operation. A DOOCS server communicates to MicroTCA Carrier Hub (MCH) of the crate via IPMI over LAN interface and provides overall management functionality for the DOOCS control system (Fig. 1).

VIEWS OF THE MicroTCA CRATES IN DOOCS

JDDD – Java DOOCS Data Display GUI (DESY designed) - was used for visualisation and management of MicroTCA crates (Figs. 2 and 3).

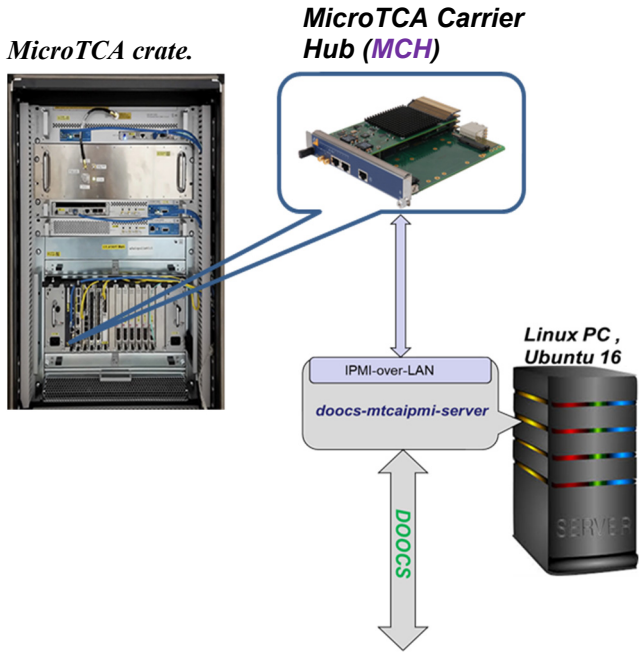

Figure 1: Hardware and software components.

Figure 2: MicroTCA 12-slot crate view JDDD.

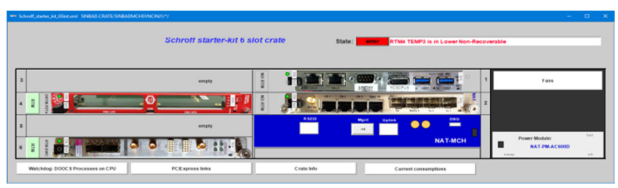

Figure 3: MicroTCA 6-slot crate view JDDD.

† vahan.petrosyan@desy.de

ISBN: 978-3-95450-209-7 ISSN: 2226-0358 doi:10.18429/JACoW-ICALEPCS2019-WEPHA120

All crate information, current consumptions, links connections and fans control are available via according panels opening from the main crate panel (Fig. 4).

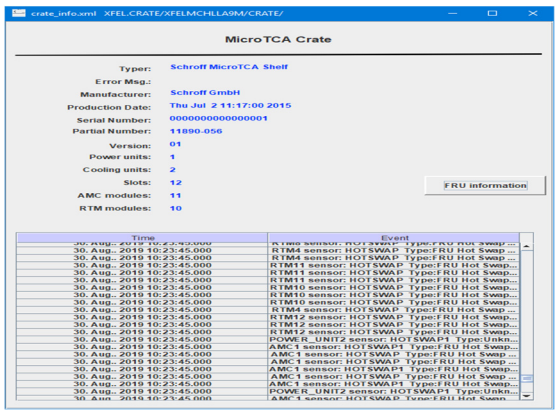

Figure 4: Main crate information and System Logs.

MANAGEMENT OF THE MODULES

The pluggable modules (FRU-Field Replaceable Unit) like Power Modules, Fan-Trays, AMCs and RTMs which are integrated in the chassis can be monitored and controlled with generic JDDD panels (Fig. 5).

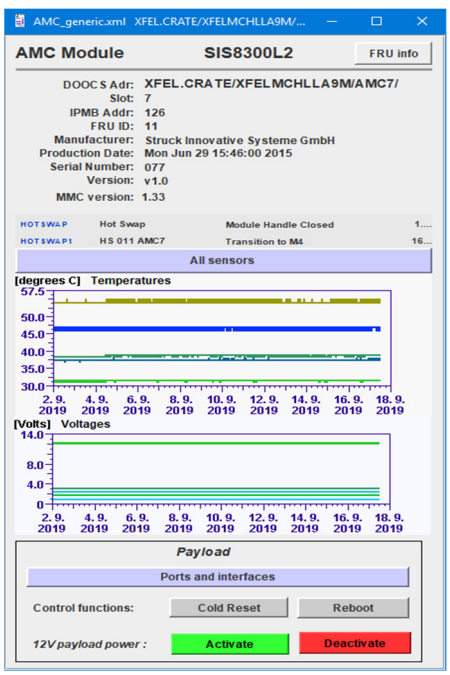

Figure 5: AMC module view JDDD.

All sensors values and its statuses are collected and saved for the further investigations (Fig. 6).

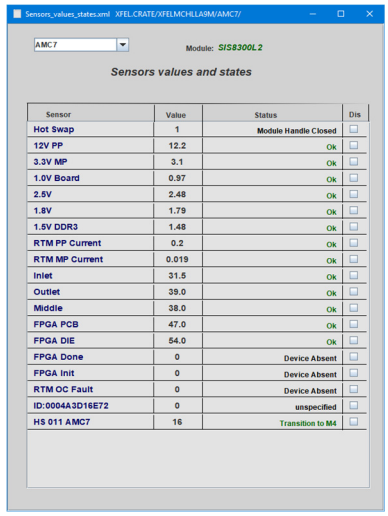

Figure 6: Sensors.

The modules can be tracked with JDTool (DESY designed) GUI using the names (Fig. 7).

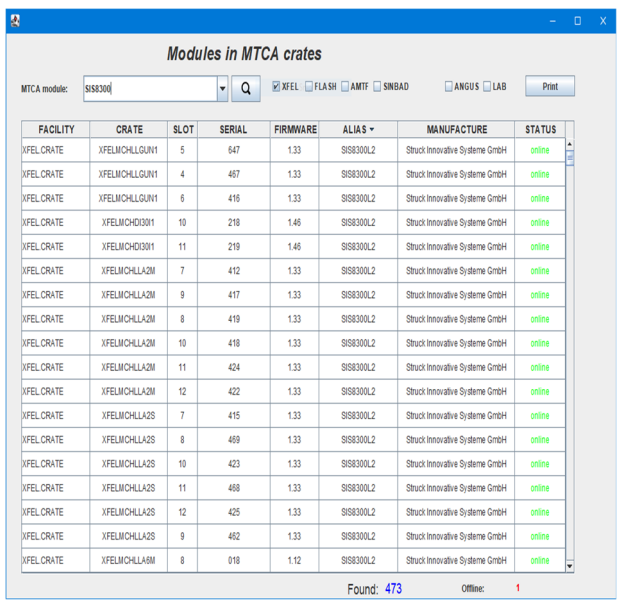

Figure 7: Tracking modules in the crates.

CONCLUSION

The integration of the management functionality of the MicroTCA crates in DOOCS control system provided possibility to monitor hundreds of the crates via one JDDD panel (Fig. 8).

ISBN: 978-3-95450-209-7 ISSN: 2226-0358 doi:10.18429/JACoW-ICALEPCS2019-WEPHA120

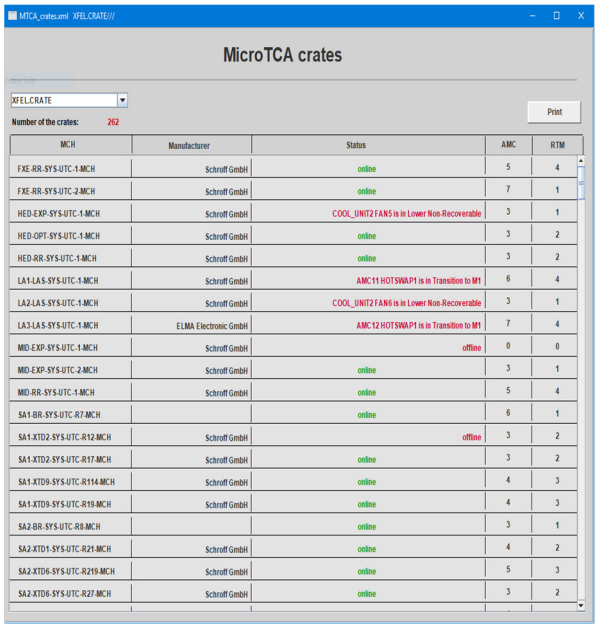

Figure 8: MicroTCA monitor.

In addition the doocs-ipmi server sends an e-mail to the subscribed users (Figs. 9 and 10).

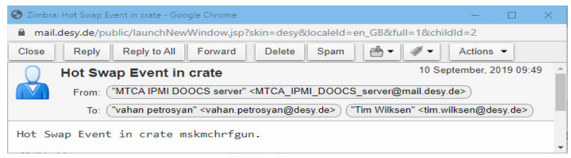

Figure 9: New Event in SEL.

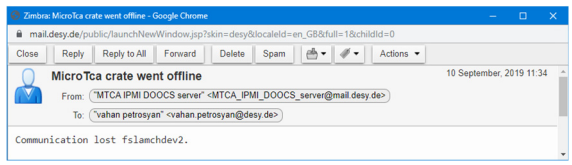

Figure 10: The crate is unavailable.

REFERENCES

[1] Open Modular Computing Standards, https://www.picmg.org/

[2] Distributed Object-Oriented Control System, DOOCS, https://doocs-web.desy.de/index.html.