MULTI-HOST MESSAGE ROUTING IN MADOCA II

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Abstract

SACLA introduced a second beamline (BL2) in 2014. To manage the complexity in multi-beamline operation, we redesigned control architecture to perform independent access controls by facility side, and reduce troubles in the ad hoc application for controls over firewall network. To fulfil the requirements, we implemented multi-host message routing in MADOCA II.

A BL master WS was introduced to intermediate all message commands between a GUI and an Equipment Manager (EM). Independent access controls can be managed by setting on the BL master WS, then the influence of miss-configuration by end-users was avoided. The new control architecture has been successfully implemented into SACLA DAQ system in September 2014.

Access Control in Message Server

- Access Control List (ACL) in a Defined File
  - Management of Access control for each message
- Extended for message routing with management method
  - Message route is attached in a message to identify the route to back the message to a GUI

Technical Issues

- Prevention of Messaging Loop
  - Checking the duplication of the hosts in the message route
- Round-Trip Time (RTT)

<table>
<thead>
<tr>
<th>Case</th>
<th>RTT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A GUI and an EM in the same host</td>
<td>0.40 ms</td>
</tr>
<tr>
<td>A GUI and an EM in different hosts</td>
<td>1.89 ms</td>
</tr>
<tr>
<td>A GUI and an EM in different hosts with an intermediate host</td>
<td>2.75 ms</td>
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</tbody>
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For PCs with DHCP connections

Solution

- Implement Multi-host Message Routing in MADOCA II
- Introduce a BL master WS to intermediate all message commands, and for independent access controls by MS setting on the WS

Multi-host Message Routing in MADOCA II

Redesigned control framework for the multi-beamline operation

- Get rid of the ad hoc socket application
- Independent access controls by facility side to avoid the influence of miss-configuration by end-users

Summary

- Multi-host message routing was implemented in MADOCA II to have sophisticated access controls
- Implemented into SACLA DAQ in September 2014, and it has been stably operating
- Also adopted into SACLA new beamline (BL1) in 2015
- Application to SPring–8 beamline controls is undergoing

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