

Traffic Reducing and Monitoring for the PEFP Control Network

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1. Introduction

Proton Engineering Frontier Project (PEFP) has developed a 20MeV proton accelerator, and established a distributed control system based on EPICS [1] for sub-system components such as vacuum unit, beam diagnostics, and power supply system. The control network of the PEFP is divided into two separate different subnets. In order to access IOC Process Variables between the separate subnets as well as IOC PVs, EPICS Channel Access Gateway [2] has been applied in the PEFP network. The EPICS channel access gateway is both a channel access server and channel access client. Clients connect to the server side, and the client side connects to IOCs and other servers. This allows many clients to access a process variable while making only one connection to the remote server, thus reducing the load on critical IOCs or other servers. [3] [4] In addition, it provides convenient access from one subnet to another and provides extensive additional access security. In this paper provides the gateway application in the PEFP control network and the method to provide a client with an access will be introduced and its result will be reported.

2. Requirement

We need to provide read access to the machine process variables for the PEFP personnel and the experimental groups and in some cases write access for specified users as well. Experiment specification is like as follows.

- CPU : Processor : Intel Xeon Processor 5160
- Processor Speed :3.0 GHz
- Main Memory : 2G PC2-5300 CL5 ECC Memory
- Hard Disk : 1TB Hot-swap SATA II HDD
- OS : Linux Redhat

To build a Channel Access Gateway, several software development tools should be installed in advance. The tools installed are EPICS 3.14.9 for a channel accessing, MEDM and StripTool for process variable monitoring and controlling. We have a very intimate knowledge of what is happening internally in the gateway.

- EPICS Base 3.14.9
- GNU Regex 0.13
- Gateway 2.0.3.0
- MEDM 3.1.3
- StripTool 12.5.12

3. Design for the Gateway

The PEFP has a single network, where most of IOCs, servers and client computers are located. The single network of the control system for accelerator operating is shared by both client and server. Therefore the PEFP control network divides into machine network and control network. In order to access IOC PVs between the separate subnets as well as IOC PVs, EPICS channel access gateway has been applied in the PEFP network. The gateway provides access security. The access security is specified gateway.pvlist in gateway. The gateway.pvlist function is to specify what process variable name patterns are allowed or denied and to optionally associate patterns with access security groups and security levels in the access file.

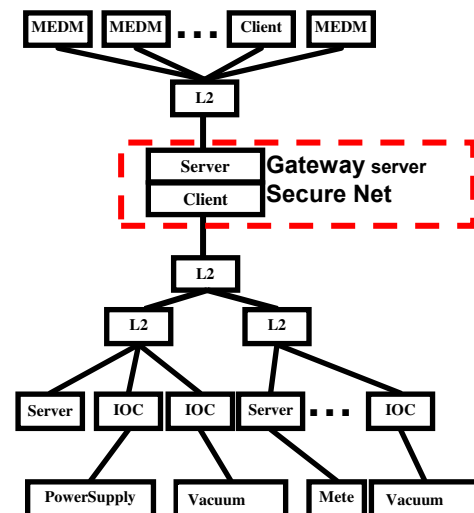


Figure 1. shows the architecture of PEFP control network

4. Implementation and Setup of the Gateway

Gateway has the process variables from the IOCs and is running on linux. There is one gateway which connects between machine network and control network as shown in the figure 2.



Figure 2. The channel access gateway of the PEFP control network.

Some panels are created using MEDM [5] and StripTool [6] for monitoring of the gateway as shown in the figure 3.

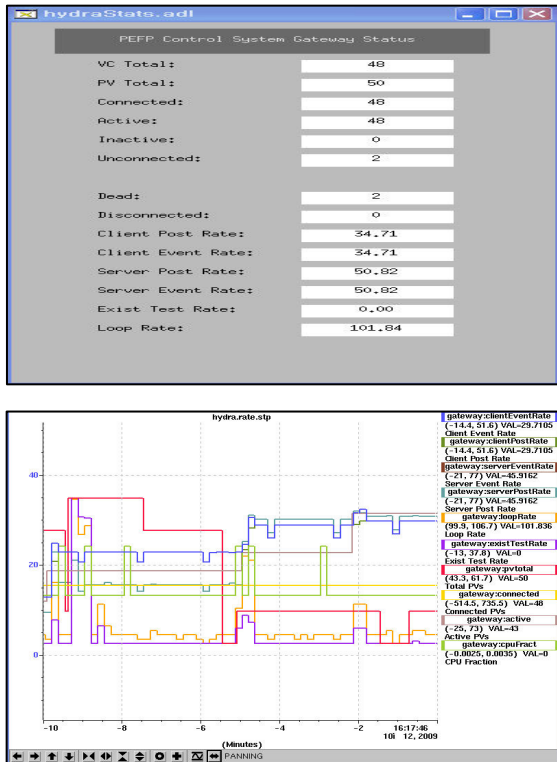


Figure 3. MEDM and StripTool for network traffic monitoring.

5. Conclusions

The gateway has put into the testing and working for one month without restart. Through this period of testing, the current version of the gateway has been found to be quite stable and capable of handling a large number of process variables. It will become an important part of the PEFP control system and will be relied upon by more and more users.

REFERENCES

- [1] EPICS, <http://www.aps.anl.gov/epics/>
- [2] Gateway, The Process Variables Gateway, <http://www.aps.anl.gov/epics/extensions/gateway/index.php>
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- [4] Kenneth Evans, Jr., "Gateway Users Guide", Advanced Photon Source Argonne National Laboratory 9700 South Cass Avenue Argonne, IL 60439, September 2005
- [5] MEDM, Motif Editor and Display Manager, <http://www.aps.anl.gov/epics/extensions/memd/index.php>
- [6] StripTool, <http://www.aps.anl.gov/epics/extensions/striptool/index.php>