**Poster Presentation**

MS52.P07

Remote Access of the beamline BL17U at Shanghai Synchrotron Radiation Facility

Q. Wang[1,2], B. Sun[1], S. Huang[1], Z. Wang[1], J. He[1]

[1]*Shanghai Institute of Applied Physics, CAS. Shanghai, China,* [2]*Graduate University of Chinese Academy of Sciences, Beijing,China*

BL17U at Shanghai Synchrotron Radiation Facility (SSRF) is a PX beamline designed to high resolution and high throughput structural determination of macromolecules and their complexes. Since it opened to user community at 2009, more than 800 structures are publicly deposited to PDB up to date by using the beamline. The beamline offer more than 160 research group beamtime, the beamtime is over subscribed seriously. Full automation is requested and the staffs keep improving the automation and convenience. Sample changer is critical for the remote operation, it let the users do not need to enter the hutch in their experiment. Several facilities have developed their own robot to achieve this purpose since ten years ago. While for a very shortly period to put the beamline in operation, we adopt the commercial robotics, ACTOR from RIGAKU company, as the sample changer. Users can put 5 uni-type pucks into the dewar one time, totally 80 cryocooled samples. The low level control software is offered by the vendor, although it is not open source, the software provide the API to further development, which can be used to integrate the robot to our software system. Under the help from SSRL, we implement the Blu-Ice/DCS system to our beamline for control and data acquisition [1]. Based on the Blu-Ice/DCS protocol [2], a new DHS is developed to integrate the ACTOR robot to Blu-Ice/DCS. All the function, such as the mount, exchange, dismount and anneal, are implemented as operations. Thus we can program the proper operation by the script engineer to meet the requirements. The intuitive GUI is in the same order as the PUCK in the dewar, the user just click the sample to mount and exchange their samples. Except the laser sensor used to make sure the sample mounted to goniohead successfully, at the same time the user can observe the mount process by the live video server which also integrated into the software. Thanks to the Blu-Ice, the multi GUI clients are supported. The authorized remote users connect to the facility intranet by VPN, by means of the NX client they can connect to the GUI computer on site, as shown in Figure 1. Then they can only run the GUI program for data collection, so the intranet network environment and the equipment are protected maximum.

[1] Wang Q., Huang S., Sun B., Tang L., He J.. (2012). Nuclear Techniques. 35, 5-11, *[2]* McPhillips T.M., McPhillips S.E., Chui H.J., Cohen A.E., et al. Journal of Synchrotron Radiation, 2002, (9):401-406

Authorized Users   Security Connect(vpn,ssh)   FireWall   GUI   DCS Server   Beamline
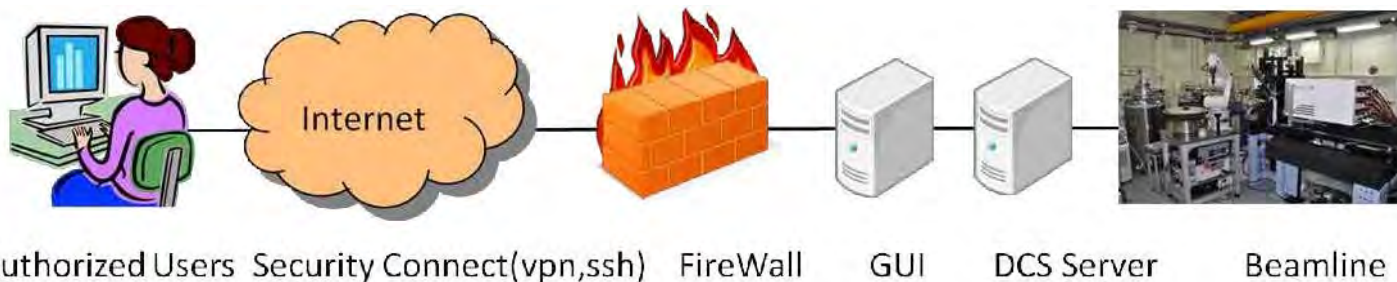
Keywords: remote access, BL17U, Blu-Ice