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Secure Remote Operation of Light Source Beamline Controls with FreeNX

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In light source beamlines, there are times when remote operations from users are desired. This becomes challenging, considering cybersecurity has been dramatically tightened throughout many facilities. Remote X-windows display to Unix/Linux workstations at the facilities, either with straight x traffic or tunneling through ssh (ssh -XC), is quite slow over long distance, thus not quite suitable for remote control/operations. We implemented a solution that employs the open source FreeNX technology. With its efficient compression technology, the bandwidth usage is quite small and the response time from long distance is very impressive. The setup we have, involves a freenx server configured on the linux workstation at the facility and free downloadable clients (Windows, Mac, Linux) at the remote site to connect to the freenx servers. All traffic are tunneled through ssh, and special keys can be used to further security. The response time is so good that remote operations are routinely performed. We believe this technology can have great implications for other facilities, including those for the high energy physics community.

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