SC22 Network Research Exhibition: Demonstration Preliminary Abstract

Open Optical Network Advanced Field Trial

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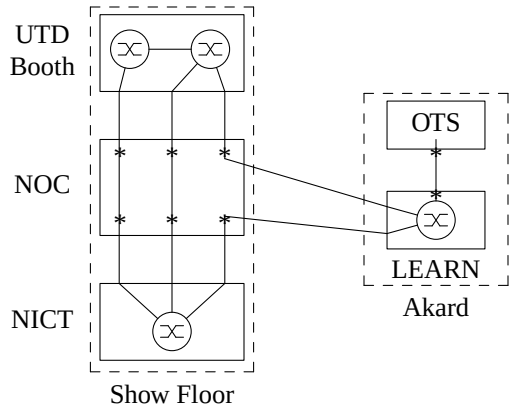
Abstract

Up until now, the Transponder, Reconfigurable Optical Add Drop Multiplexer(ROADM), and compute portions of the OpenROADM research have been done in the safety of a single physical environment. While this has led to great strides for OpenROADM, this year we are looking to expand our reach like never before. We aim to achieve this by spreading our our ROADM infrastructure, in order to manage across real fibers and facilitate connections for other research demos during SC22. We plan to do this by leveraging a main site in the UTD booth, as well as a site at NICT and in Akard, shown below:



The Akard site is especially important to us as it is the terminating point for multiple 100G connections between our campus and Science DMZ that are in the process of being created for SC this year. While we could leverage them over existing channels, having the OpenROADM network will allow researchers from across our campus to conduct experiments that we plan to present directly on the show floor. Additionally, the topology presented and the "fiber in the ground" will further the research conducted with the OpenROADM gear, giving valuable insights to the work conducted and uniquely affording the researchers the opportunity to provide evidence that their work is not limited to a lab environment.

Goals

1. Connect bespoke LEARN and OTS 100G ARDC and campus connections via OpenROADM
2. Use OpenROADM Based Network in Booth to support presenting UTD Research on show floor
3. Test the network with Mesh vs. Ring
4. Add OpenROADM Site to NICT to aid in supporting Keio Univeristy with their research.
5. Test restoration mechanism in the OpenROADM controller over the mesh at L0/L1.

Resources

The resources that will be required to make this work fall into two categories: Fiber and Power. The first is around Dark Fiber, both inside the convention center and beyond. From the show to WAN, we will need two pairs of dark fiber to Akard. We will terminate these in either LEARN's or OTS's cage to allow us to support a two-degree ROADM in Akard. We will also need a cross connect dark fiber from LEARN to OTS to allow us to place a transponder in the other cage and the aforementioned link. For the show floor, we need a minimum of two, preferably three dark fibers from the UTD booth to the NOC, as well as the same count from the NICT booth to the NOC. This is to allow us to simulate the ring and mesh topologies mentioned above. We would like to go through the NOC so if reconfiguration to the outbound Akard links in needed, it can be done on your patch panel as opposed to laid fiber. Additionally, there is a low but non-zero possibility that due to continued travel restrictions NICT will not be able to attend, in which case having the fibers to the NOC will allow either a ROADM to be placed there or to simply repatch appropriately for the Akard connection. For power, we will need power for the equipment in the UTD booth and the NICT booth for the ROADMs, 2x30A 208 3-Phase for UTD and 1x30A 208 3-Phase for NICT to power PDUs. This is in addition to any power costs covered in Akard or if LEARN or OTS wants to charge for the space used, which would be a minimum 8RU and 2RU respectively.

Involved Parties

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