

## **Incident Report for CU-Boulder Campus Border Router Outage**

**July 23, 2012**

### **Issue**

Sunday, July 15, 2012 at 4:30 am OIT received automatic notification from our monitoring systems and from clients that some on-campus web pages, E-Mail access, and VPN access were unavailable from both on-campus and off-campus locations. The problem was intermittent, re-occurring through Wednesday July 18, 2012 at 1:05 am. The problem was resolved July 18, 2012 at 5:30 am by replacing a fiber-optic interface module in the TCOM border router and rebooting the border router cluster to re-synchronize the units.

### **Background**

The CU-Boulder campus network architecture uses two border router/firewalls in a clustered environment that allows for high-availability, off-campus network connectivity. The two units contain routing processing engines that are connected, for synchronization purposes, via the campus fiber-optic cabling infrastructure. This allows one unit to operate as the primary router and the other unit as secondary router. The routers are located in separate buildings to provide geographic separation. Fiber-optic patch cords are used to connect the router processing engines to the underground fiber-optic cables installed between buildings on the CU-Boulder campus.

### **Cause**

During the course of this outage multiple steps were taken to return the service to normal operating condition. The suspected causes during the three-day period of intermittent outages were a defective fiber-optic patch cord inter-linking the two border routers, miss-matched synchronization between the routing engines, and a defective 10-gig fiber-optic interface module located in the TCOM border router.

### **Solution**

On July 18, 2012 at 5:40 am the 10-gig fiber-optic interface module in the TCOM border router was replaced and the border routers rebooted to re-synchronize their roles as primary and secondary units. The system has been monitored since the module was replaced with no further interruption to the service.

### **What can be done to prevent this again?**

OIT is working with the manufacturer to install additional connections between the geographically diverse border routers, increasing reliability and service uptime. Phase I of the this process was put into place on July 19, 2012 and phase II is in the process of being completed. Previous versions of the manufacturer's software did not allow for this current level of redundant connectivity.

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