NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Lesson Learned
Excessive Resource Utilization

Primary Interest Groups
Balancing Authorities (BA) Reliability Coordinators (RC) Transmission Operators (TOP)

Problem Statement
Due to a failed interface device, a registered entity had internal data communications partially interrupted during a period of excessive network traffic across its optical wide area network links. There was no loss of situational awareness by operations as a result of this issue.

Details
The optical telecommunications network, which connects routers on a registered entity's network, experienced excessive traffic because of a failed interface on a device at one of the regional locations. Simultaneously, two network routers experienced issues where they were unable to reestablish communication with the rest of the network after the excessive network traffic finalized. The increased traffic caused unnecessary resource utilization on affected routers connected to the optical network. The high resource utilization rose to one hundred percent on these devices, which in turn; caused devices to drop incoming traffic.

This event would be analogous to congestion on a telephone network affecting a customer's ability to complete a call. A home telephone is connected to a central office phone switch which is networked to many other central office switches across the country. The event that occurred would be equivalent to a central office switch having problems that caused it to lose its connection to the other central office switches and then overwhelming the network by attempting to reestablish the connections. During this period, home telephone users would not be able to complete their calls because the network would be congested with the switches trying to communicate to each other. After the switches would reestablish communications with each other, the congestion would be reduced, the telephone network would return to normal and customer calls could be completed.

Corrective Actions
The two faulty network routers were removed from the network, ending their interference with other devices. In order to correct the synchronous optical network problem, one data link interface module was identified as being faulty on the optical network and had to be replaced.

Lessons Learned
Resource threshold monitoring should be established on applicable devices to trigger when an abnormally high threshold is exceeded. This will allow support personnel to identify which specific resource on a device is contributing to an issue. Monitoring will provide proactive identification of issues and promote rectifying those issues in an expedient manner. Traffic throttling options should also be researched.

In addition, entities should consider adding bandwidth aggregation alarms on optical network's data link interface modules. Support personnel will be able to detect earlier signs of which optical connections are experiencing issues before a failure occurs.

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For more Information please contact:

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