

ILLINOIS CENTURY NETWORK

**NETWORK AND SERVICES UPDATE:
MULTI-PROTOCOL LABEL SWITCHING IMPLEMENTATION**

Submitted for: Information

Summary: The ICN has recently migrated to a new routing protocol, Intermediate System-Intermediate System (ISIS). This technical migration is necessary to support Multi Protocol Label Switching (MPLS) which will improve the efficiency of the ICN and change the way that constituents can use the network. This item describes the advantages and necessity of this migration.

Action Requested: None.

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The Illinois Century Network (ICN) is always changing, growing, and working. Some changes like the development of Internet Protocol Quality of Service (QoS) and Internet Protocol multicast are visible to constituents. However, most of the changes on the ICN are never seen by our constituents. One such change is the recent migration of the ICN's Interior Gateway Protocol (IGP). An IGP enables an Internet Protocol (IP) router to share information about its connected constituents with other IP routers on the ICN. This sharing is needed in order for all ICN constituents to be able to speak with one another.

From the time it was started 7 years ago until May 15, 2003, the ICN used an IGP that, although functional, had several problems. Those problems included:

- The protocol was notoriously unstable, often misdirecting or loosing customer data due to software bugs.
- The protocol was vendor proprietary, tying the ICN to one vendor. The ICN was dependent solely on that vendor for support and service. It also meant there was no well defined standard as to how the protocol would behave.
- The protocol lacked support for many features that the ICN wished to use.

Early last year the ICN began planning to change IGPs from the current vendor proprietary protocol to an open protocol called Intermediate System-Intermediate System (ISIS). IGP protocol migrations are known to be notoriously tricky, and the ICN's change was no exception, taking almost a year of work during the weekly Saturday midnight outage windows to complete.

The new protocol has many advantages over the old that, while not immediately visible to the customer, will shape the network the ICN will become in the years ahead. Some of those advantages include:

- A large number of users use ISIS. ISIS is used by most of the worlds largest Network Service Providers. ISIS is the most well used and well tested IGP in use today.
- ISIS is an open standard maintained by the Internet Engineering Task Force and not tied to any one vendor.

- ISIS has complete support for IP version 6, used on Internet2 and other next generation networks. The network is now ready when those services become available to the ICN.
- ISIS can carry special information to assist in the deployment of multi protocol label switching (MPLS). MPLS will revolutionize the way the ICN is used, allowing constituents to carry data over the ICN in virtual Ethernets allowing them to extend local LANs anywhere in Illinois. The ICN will begin MPLS deployment in June 2003.
- ISIS has the added benefit of being able to route around link failures much faster than the previous IGP. When a backbone link fails due to telephone company issues like fiber cuts, our constituent data will be routed around the failure faster than previously possible. After a fiber cut it used to take several minutes for this rerouting to occur, the new IGP is able to do this same work in less than a second.

While customers won't see an immediate benefit from this work, the engineering staff at the ICN is very proud of this recent accomplishment and is happy to have passed another mile stone on the road to providing world-class service for the Illinois Century Network constituents.