

Application Note

Athena Delivers Enhanced Service for Internet Service Provider

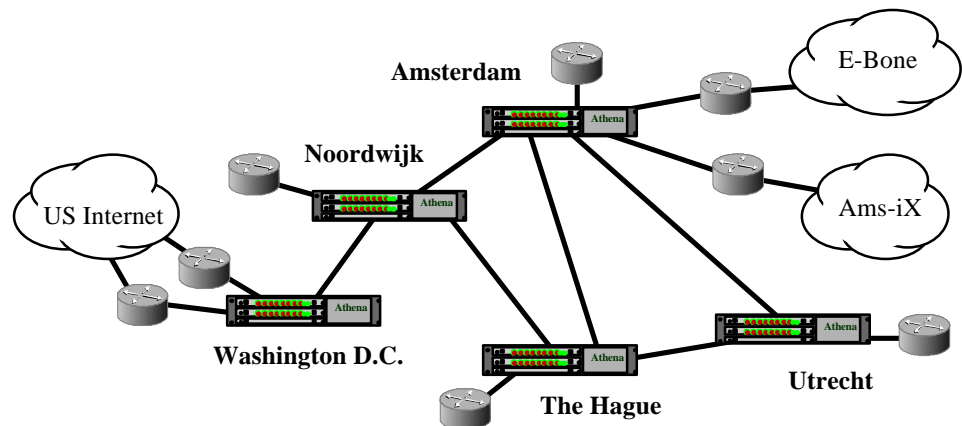
Internet Exchange Europe (iXe) is a Dutch Internet Service Provider that specializes in providing high quality Internet connectivity for corporate users and smaller ISPs. iXe provides complete Internet solutions with dedicated bandwidth services to Internet resources throughout The Netherlands, Europe and around the world.

iXe has experienced rapid growth in its Internet access customer base and they decided that to continue to offer a premium level of service, it would be necessary to upgrade their backbone network to an **Athena** Frame Relay switch. Until earlier this year, iXe operated an IP network with backbone routers in The Hague, Noordwijk, Amsterdam and Washington DC. The Amsterdam node site has connections to AMS-IX, the Dutch national Internet Exchange point, and

continues to grow, additional node sites will be installed to optimize facilities costs.

The iXe network currently supports approximately 50 corporate clients connected at access speeds from 64K Kbps to 256Kbps but with the demand for Internet access growing at a phenomenal rate, iXe expects to see its user base more than triple in the next year alone. iXe felt that their existing IP network would not adequately handle this dramatic growth so they opted for a different approach to the backbone network. Some of the key issues that they needed to address included:

Guaranteed Bandwidth. In striving to set themselves apart from the competition, iXe has tried to provide a superior level of service. Jan Hoogenboom, General Manager of iXe, stated



Ebone, a network formed by a European Internet consortium to interconnect all major European networks. A 256 Kbps link to the Washington DC node provides a direct connection to the Internet in the United States.

Later this year iXe will add a fifth node in Utrecht and upgrade the Washington DC link to 768 Kbps. Over the course of 1997, iXe plans to roll out another four node sites and introduce a national flat rate tariff, independent of actual leased line costs or distance. As the network

“Our customers are asking for a guaranteed level of performance to the key Internet networks, especially the networks in the USA.” The need to have a network that would provide bandwidth guarantees, yet still allow bursts of high bandwidth traffic, was an essential part of iXe’s strategy. With the growth in the number of users, and many of the existing users asking for higher speed access, the need to move to a more flexible and scalable network became apparent. This flexibility should allow for increased bandwidth between locations as user needs continue to grow.

Quality of Service. As Jan Hoogenboom explains, “Bandwidth and Quality of Service are becoming of vital importance in the extremely competitive Internet world of today and tomorrow. Frame Relay turns out to be the logical answer to the challenges faced by ISPs around the world. It provides features, in terms of stability and bandwidth management, that a router-based network just can’t deliver.”

Management. As the iXe network grew, the increased demand on management staff became apparent. Managing a continually changing router network can be a major effort that can often cause network instability. iXe recognized the need to be prepared for this increasing growth and was looking for a solution that would provide an easier expansion path plus on demand management information.

Network Resilience. The Internet, for many companies, has become a key business tool for communicating with clients, business partners and potential customers. Through Email and Web server technologies, these companies are using the Internet as an essential part of their day to day business activity and they expect the network to be reliable. iXe’s plan was to build more reliability into the network by moving to a Frame Relay backbone architecture that would be less susceptible to network failure when adding users.

Cost. The ISP business has become very competitive so detailed evaluation of the investment in equipment is essential. iXe was looking for a high performance, cost effective solution that would not only meet their needs today, but could expand with them in the future.

iXe chose the **Athena Enterprise Frame Relay Switch** for their backbone network infrastructure since it provided a cost effective solution that addressed all of their requirements. Athena systems have now been installed in each of the four existing node sites and plans to add more sites are already under way. An implementation plan is also in process to upgrade the current access routers to support frame relay and migrate their connections off the backbone routers and on to the Athena backbone.

Each Athena node has been configured with redundant power supplies and the inherent multi-processor architecture provides an extremely high level of reliability and resilience. The iXe network is also configured with multiple internodal links so that Athena’s intelligent nodal routing strategy will guarantee data delivery and provide

automatic traffic rerouting in the event of a link failure. iXe is also considering the possibility of adding Athena’s ISDN features to enable on-demand leased line back-up for national and transatlantic connections.

To ensure guaranteed bandwidth to their key corporate customers, iXe has established virtual connections from each access router to the three Internet access points. Athena uses its advanced prioritization and congestion management strategies to ensure that this minimal bandwidth is always available. An added benefit to iXe customers is that when traffic is light, all users have access to the full available bandwidth and can burst over their minimum guaranteed rate.

As Jan Hoogenboom explains, “The Athena solution gives us a new unique selling point that we can now offer our customers, namely direct single-hop connections and bandwidth to all major Dutch, European and International Internet exchanges. Previously, a customer would connect to a local router and then be routed through several, possibly congested, boxes and trunks before he would finally reach the destination Internet exchange. Each hop adds delay, possible congestion, instability and risks. It ‘feels’ like a very long path to get to where you want to be. Now, with Frame Relay, each user has a direct connection, as if he had bought his own direct leased lines. His traffic travels in one single hop from his own router to the router at the Internet exchanges. No intermediate steps, no delay, no risks. It’s simple and ‘feels’ fast.”

iXe found that Athena’s comprehensive internal management system allowed them to easily add new customers without fear of disrupting existing network users. Also, the ability to quickly and dynamically change the guaranteed bandwidth level on an individual circuit basis allows iXe to quickly and easily respond to customer needs. Jan Hoogenboom stated that, “Due to the new Athena Frame Relay infrastructure, we are finally able to offer competitive services at access speeds up to 2 Mbps because now we can still guarantee all our smaller users their subscribed bandwidth. As average access speeds increase very quickly, we expect several of our existing, and new, customers to connect at 2 Mbps.”

All of these Athena features are available in a cost effective scaleable architecture that allows iXe to continue to grow and expand the network without having to replace core network components. Jan Hoogenboom summed it up best when he commented that, “after a year of evaluating Frame Relay products, we found Athena to be the best price/performance product we saw.”