



Internet/Internet2 Provisioning Guideline

Technology Guideline

Background

Information Technology Services provides inbound and outbound Internet and Internet2 access to all computers connected to UNI-Net. UNI's primary Internet service provider is the Iowa Communications Network which carries all traffic destined for the commercial Internet on one virtual circuit and Internet2 (I2) traffic on a separate virtual circuit. Internet and I2 are both shared resources and have similar characteristics when operating under a heavy load:

- bandwidth is limited by the size of the connections to each of these networks
- no prioritization or Quality of Service definition currently exists for application type. Traffic optimization is based on packet type and size, NOT impact on application so that high bandwidth applications such as peer-to-peer sharing and file transfer programs will overwhelm other applications and consume as much bandwidth as is available
- when the network is congested, packets of information are discarded causing network delays
 - some applications (e.g. email, file transfer) can withstand network congestion
 - other may break due to lost packets (e.g. some web applications, real-time voice/video/simulation)

Guideline Effective January 1, 2004

ITS is committed to providing reasonable Internet & I2 bandwidth to each computer connected to UNI-Net (10,000 + IP addresses). However since both the Internet and I2 are shared resources, ITS must protect against any single machine/application consuming more than is reasonable, i.e. inordinate usage. In the event that a machine or application is consuming an inordinate amount of Internet bandwidth during a period of heavy load, ITS shall take action to limit the impact on the University's Internet connection. This action may range from a user initiated change to the offending machine or application to a strict enforcement of an Internet bandwidth limit.

The intent of this guideline is to: provide a mechanism for assessing when traffic is considered inordinate; identify levels of response; and work with high bandwidth consumers to maintain reasonable response time for all applications and users.

This guideline should only be employed when UNI's Internet and I2 connections are heavily used and are susceptible to the ill effects of congestion. In general, this will be considered to be between the hours of 7am and 5pm.

Definitions:

Heavy Load - Internet and I2 capacity shall be considered under heavy load when either inbound or outbound average utilization between the hours of 8am to 5pm exceeds 50%. Under these loads, even small sustained loads can create network congestion leading to packet loss.

Inordinate Consumption - During periods of Heavy Load, any machine that averages more than one-half a percent (.5%) of UNI's total bandwidth over a period of one hour shall be considered as being in a state of Inordinate Consumption. Machine load will be calculated by dividing the total number of bits transferred either in or out by the total number of bits available based on size of the existing connection for a period of one hour. (For Fall 2003, this will be calculated as 45Mb X .5% X 3600 Seconds = 810Mb or 100MB. This is an average of 225Kbps.)

ITS Response to Inordinate Bandwidth Consumption

For incidences involving severe impact to campus connectivity (i.e. the incident is completely consuming or significantly reducing network performance for either inbound or outbound traffic), ITS will take immediate action to contact the owner. If owner is unavailable, ITS will disable the connection. Our experience to date is that this behavior is abnormal, and may be due to a compromised machine or mal-configured application.

Solution for machines using Inordinate Bandwidth

- Change the nature of the application to reduce bandwidth consumption.
- Change the time of day, day of week, of the bandwidth hungry application to a time frame when UNI Internet connections are not under Heavy Load.
- Additional Internet or Internet2 bandwidth may be purchased for a single or group of machines in a specific IP range. The cost will be \$1,000 per 250Kb of Internet traffic. These machines will have first priority to purchased bandwidth and will be allowed to compete for any remaining university bandwidth.
- With repeated occurrences of Inordinate Bandwidth Consumption, a bandwidth limitation of .5% of current UNI Internet connection will be applied to machine(s) that continue to abuse this resource. This restriction will apply to all Internet or Internet2 transmissions.

Quotas and Costs (January 1, 2004)

- Inordinate Consumption (.5% of 45Mb) is 225Kbps sustained over 1 hour
- Additional capacity Internet capacity sold is in 250Kb units at \$1,000 per year

Drafted June 17, 2003. Implemented by PPCIT November 20, 2003

Source URL: <http://www.uni.edu/its/policies/internetinternet2-provisioning-guideline>