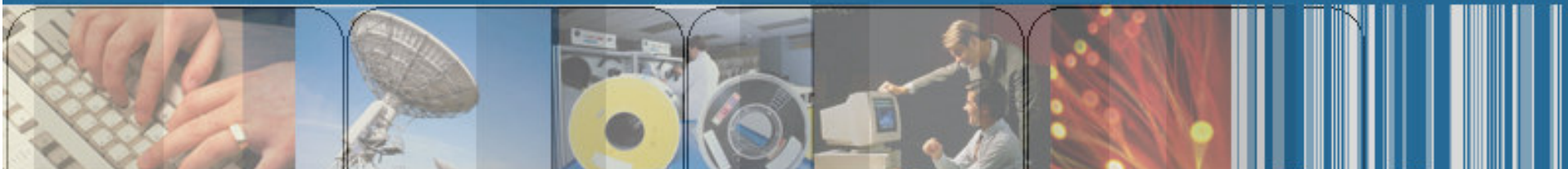
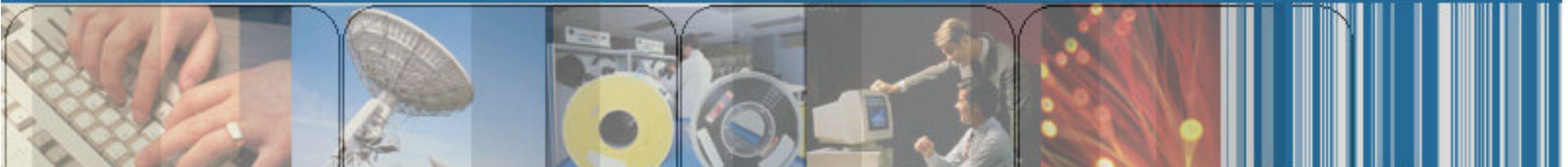


A presentation on QoS



Agenda

- Quality of Service
- Problems with e-Business Servers
- Problems with Corporate Networks
- Need for Quality of Service
- NPI solutions
- Product Overview
- User Interface



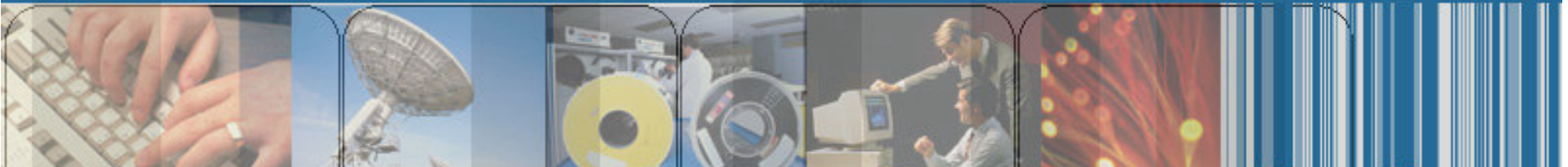
Quality of Service

What?

- A set of mechanisms for providing guarantees for IP flows

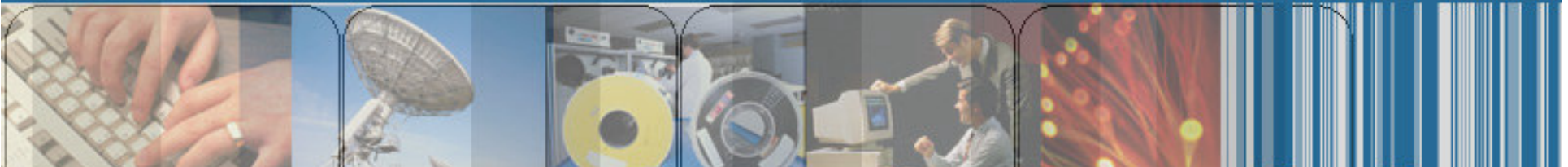
Why?

- Highly advanced desktop machines
- Massive increase in Internet usage



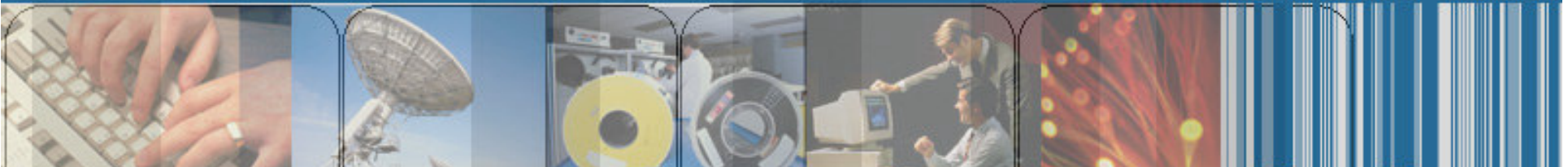
Problems with e-Business servers

- Very few genuine buyers
- Lots of casual visitors
- All Web traffic goes with best-effort service so genuine buyer suffers due to traffic of casual visitors
- Need for preference to “frequent buyers” or “registered users”



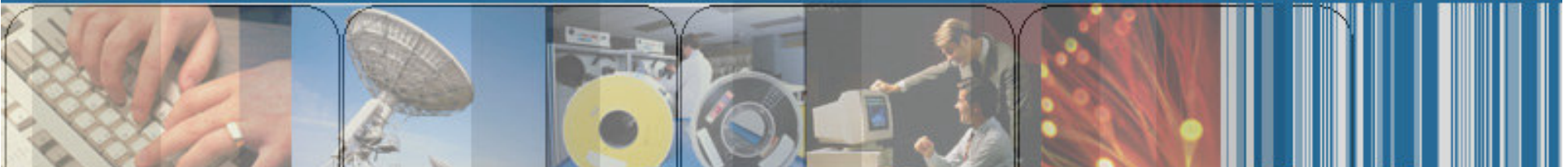
Problems with Corporate Network

- No Quality of Service provided in existing IP network
- All IP traffic is routed with "Best Effort"
- Slow response due to network congestion



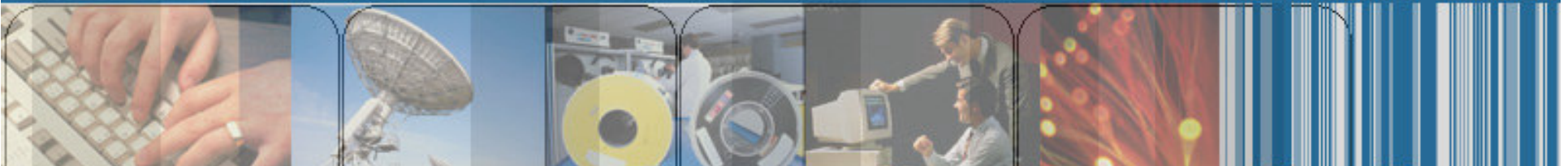
Need for Quality of Service

- Response of URLs related to buying a product should be faster.
- Registered users should be given preference
- Categorization of bandwidth for premium segment users



NPI Solutions

- Net Pacer (Web)
 - Preferential access to high priority URLs
 - Resides on HTTP server
 - Based on Differentiated Services (DiffServ)
- Net Pacer (Corporate)
 - Preferential access to high priority users
 - Resides on Proxy server
 - Based on Differentiated Services (DiffServ)



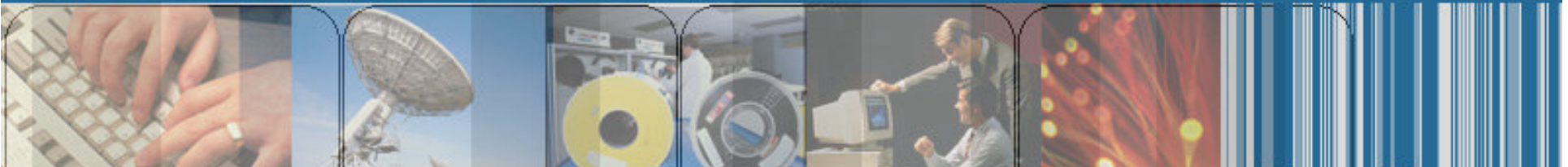
Net Pacer (Web) Overview

- Existing Features
 - User can assign priority to any URL (upto 5 priority classes)
 - % Bandwidth for each priority class can be controlled
 - Unused bandwidth of any class can be used by other classes.



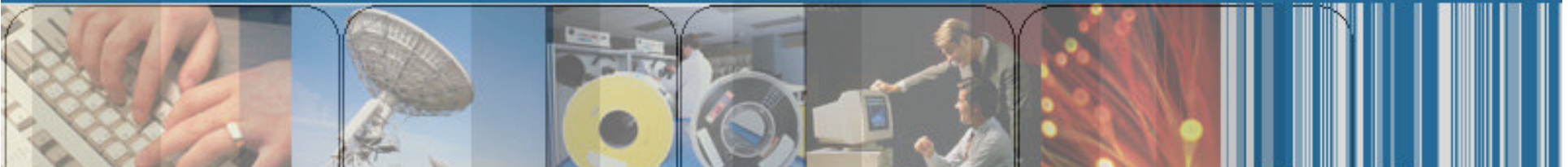
Net Pacer (Web) Overview

- Statistics data collection (Tabular and Graphical)
 - Average Delay
 - Jitter (Delay variation)
 - Packets Transmitted
 - Packets Dropped
 - Over Limit Packets
 - Queue Length
 - Maximum Queue Length



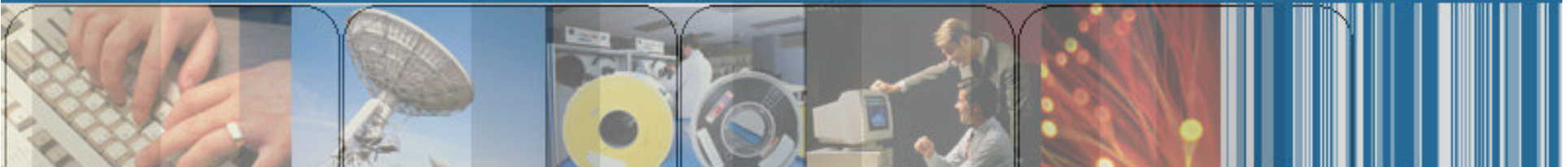
Net Pacer (Web) Overview

- Dynamic URL support
- Priority for the registered users
- Licensing
- User Friendly Interface



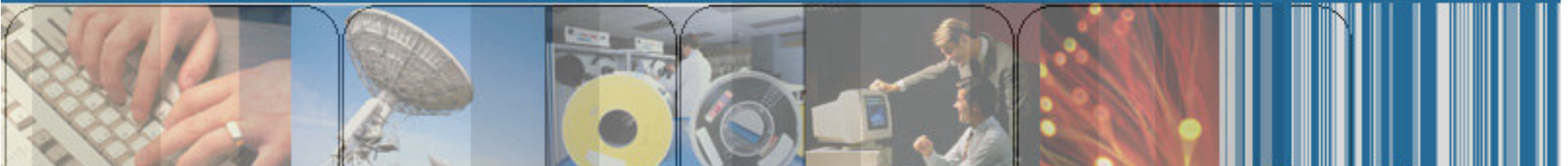
Net Pacer (Corporate) Overview

- Existing Features
 - Different Service Profiles (classes) can be created
 - % Bandwidth for each class can be controlled
 - Unused bandwidth of any class can be used by other classes
 - Bandwidth control for both ingress and egress directions



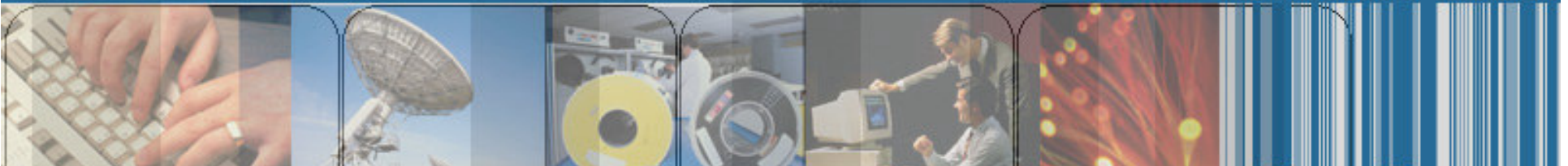
Net Pacer (Corporate) Overview

- Policies can be created based upon
 - Source IP Address
 - Destination IP Address
 - Source Port
 - Destination Port



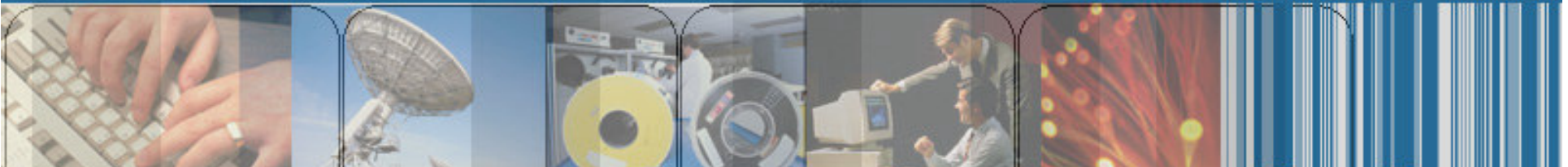
Net Pacer (Corporate) Overview

- Statistics data collection (Tabular and Graphical)
 - Average Delay
 - Jitter (Delay variation)
 - Packets Transmitted
 - Packets Dropped
 - Over Limit Packets
 - Queue Length
 - Maximum Queue Length



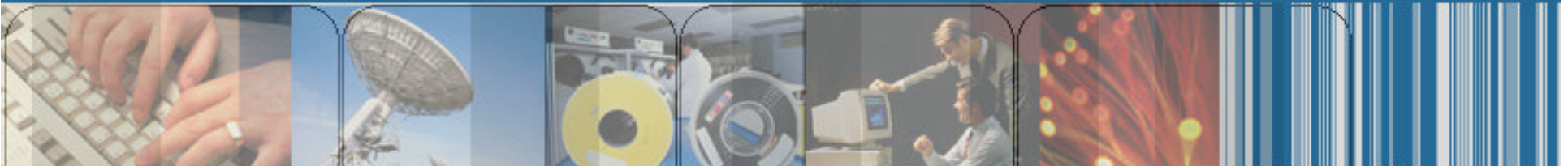
Net Pacer (Corporate) Overview

- Firewall
- Time Based QoS
- Licensing
- User Friendly Interface



System Requirements

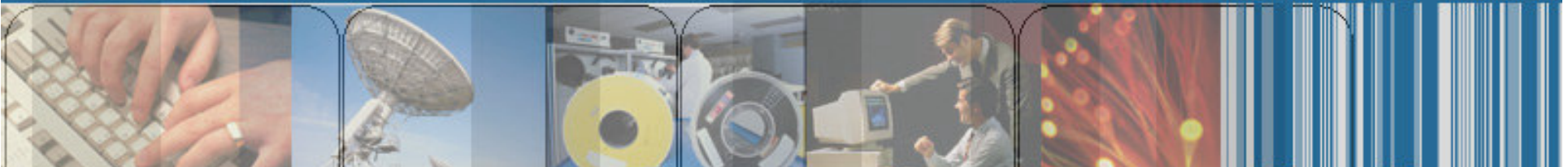
- Server
 - PII 266 MHz or higher
 - 64 MB RAM minimum
 - Linux OS (kernel version 2.2.18)
 - Apache's HTTP/Proxy server version 1.3.12
 - Minimum free disk space of 1 GB.
- Client
 - Tcl/Tk (version 8.0) and BLT for GUI.



Net Pacer (Corporate)

Application Environment

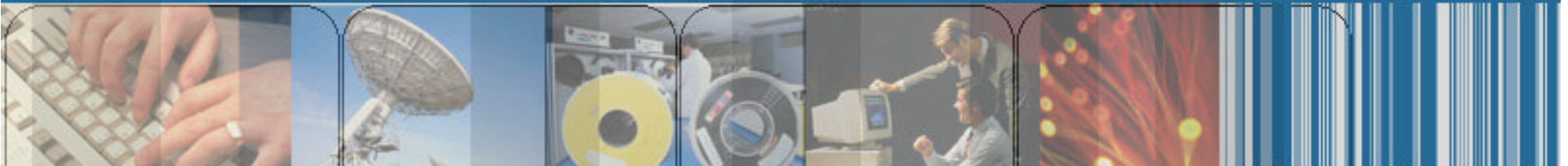
- Enterprises
 - Mission Critical Application protection
 - Internet Connection
 - Universities
 - VoIP Protection
- Service Providers
 - Internet Service Provider
 - BroadBand and Wireless
 - Cable
 - Satellite
 - Multi-tenant Intelligent Buildings
 - Web hosting



Net Pacer (Corporate)


Application Environment

- Prioritizing URLs on Web Server
- Prioritizing Buyers in Web Site
- Prioritizing Banners in Web Site
- Prioritizing Registered users of Web Site



Net Pacer (Corporate)

Main Menu



Configure Service Profile

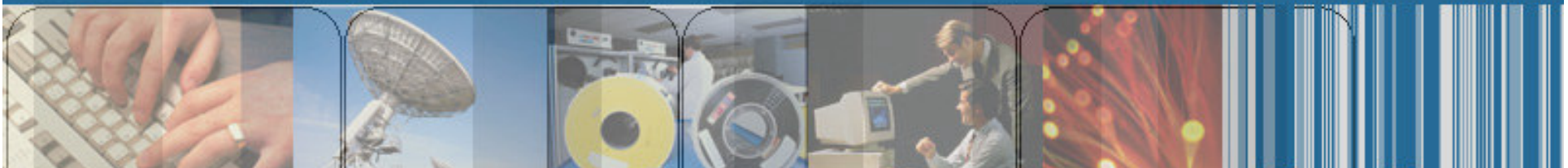
Set Policy Rules

Statistics

Help

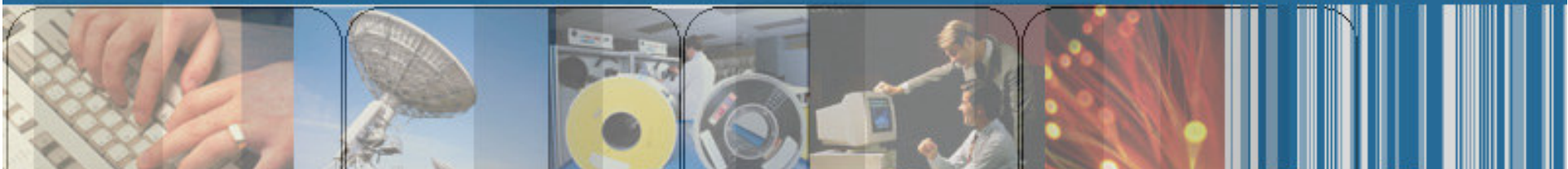
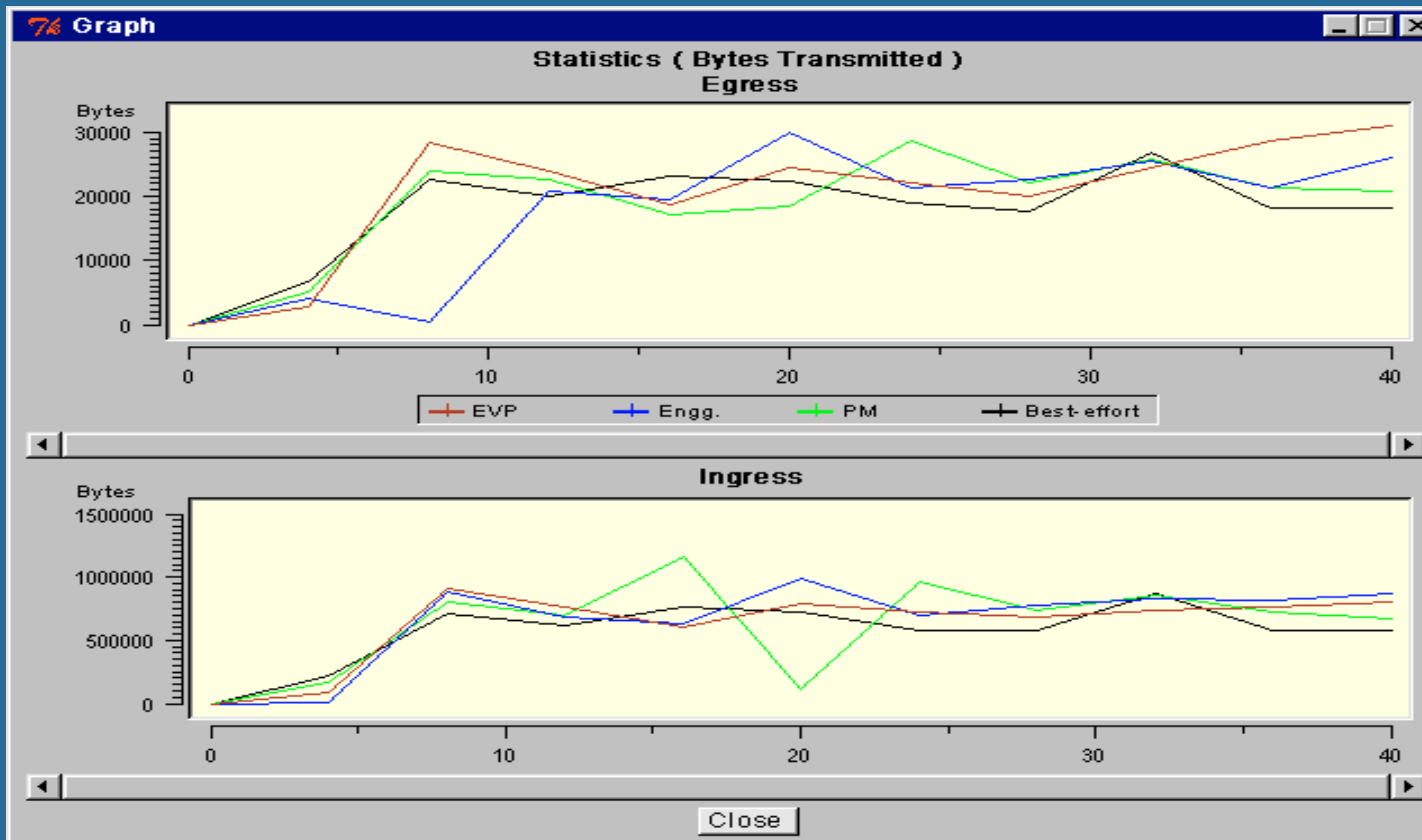
Exit

A product by
Network Programs



Net Pacer (Corporate)

(Bytes Transmitted- Egress and Ingress)



Net Pacer (Corporate)

Statistics - Egress and Ingress

Table

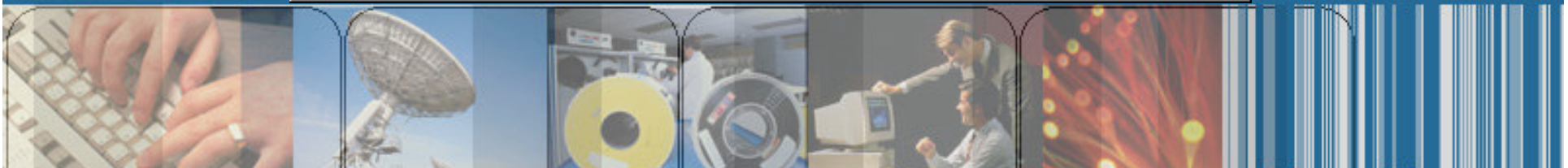
Statistics all Egress

Parameter ----- Service Profile	Average Delay microsec	Max Queue Length Bytes	Number of Packet Transmitted	Byte Transmitted Bytes	Overlimit Packet	Number of Packet Dropped	Queue Length Bytes
EVP	137	63300	41	2706	0	0	0
ENGG.	179	61440	59	3953	0	0	0
PM	154	61440	77	5141	0	0	0
BEST-EFFORT	211	60000	99	6588	0	0	0

Ingress

Parameter ----- Service Profile	Average Delay microsec	Max Queue Length Bytes	Number of Packet Transmitted	Byte Transmitted Bytes	Overlimit Packet	Number of Packet Dropped	Queue Length Bytes
EVP	13926	36000	51	83500	0	0	0
ENGG.	44613	26400	91	13102	0	0	0
PM	56009	16400	118	171512	1	9	0
BEST-EFFORT	114408	64000	156	223872	3	21	0

Close Refresh



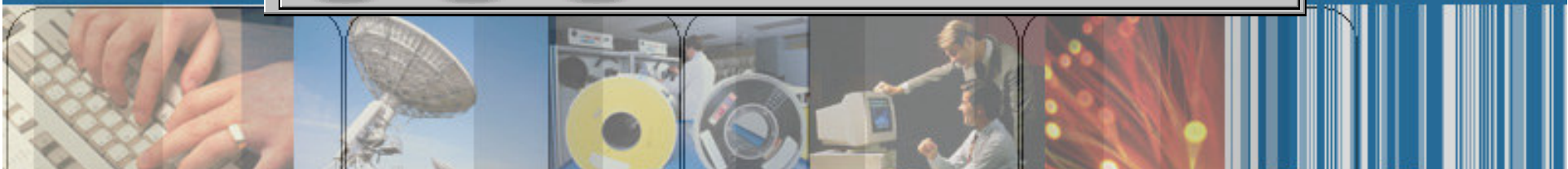
Net Pacer (Corporate)

The screenshot displays the NetPacer (Corporate) software interface. The main window has a title bar that reads "76 NetPacer (Corporate)". The main area contains a circular logo on the left with the text "NetPacer Corporate". To the right of the logo are several buttons: "Configure Service Profile", "Statistics", "Set Policy Rules", and "Firewall". Further right are "Help" and "Exit" buttons. Below these buttons, it says "A product by Network Programs".

Overlaid on the main window is a dialog box titled "76 Firewall Add/Edit Menu". This dialog box contains several input fields and options:

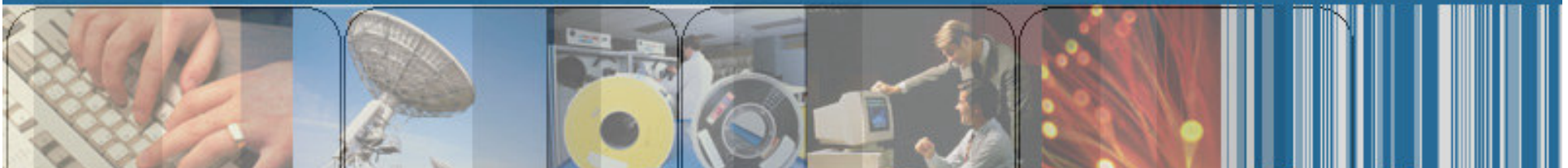
- Source Address: [Text Field] Exclude
- Destination Address: [Text Field] Exclude
- Protocol: [Dropdown Menu] Exclude
- Source Port: [Text Field] Exclude
- Destination Port: [Text Field] Exclude
- Interface: [Dropdown Menu] Exclude
- Action: [Dropdown Menu]
- Redirect Port: [Text Field]

At the bottom right of the dialog box, there are two radio buttons: Unidirectional and Bidirectional. At the bottom of the dialog box are three buttons: "OK", "Cancel", and "Help".



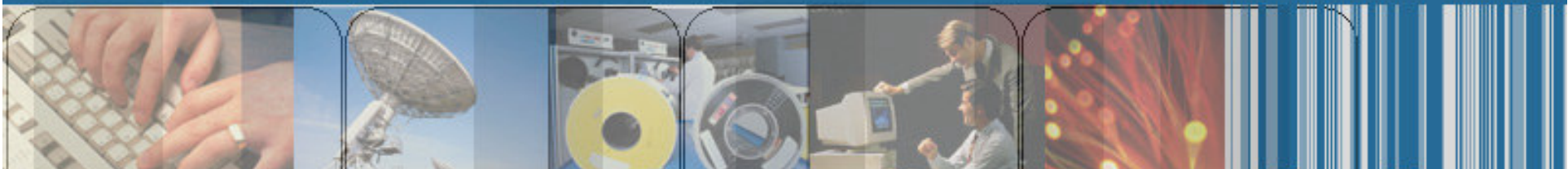
Net Pacer (Web)

Main Menu



Net Pacer (Web)

The screenshot displays two overlapping windows from the NetPacer (Web) application. The top window, titled "NetPacer (Web)", features a navigation menu with the following options: "Bandwidth Management", "User Based Prioritization", "Exit", "Help", "HTTP Configuration", and "Statistics". The "NetPacer web" logo is on the left, and the text "A product by Network Programs" is on the right. The bottom window, titled "HTTP Policy Edit", contains a form with the following fields: "URL Name" (text input), "Old Priority" (text input), and "New Priority" (dropdown menu). At the bottom of this dialog are three buttons: "OK", "Cancel", and "Help".



Net Pacer (Web)

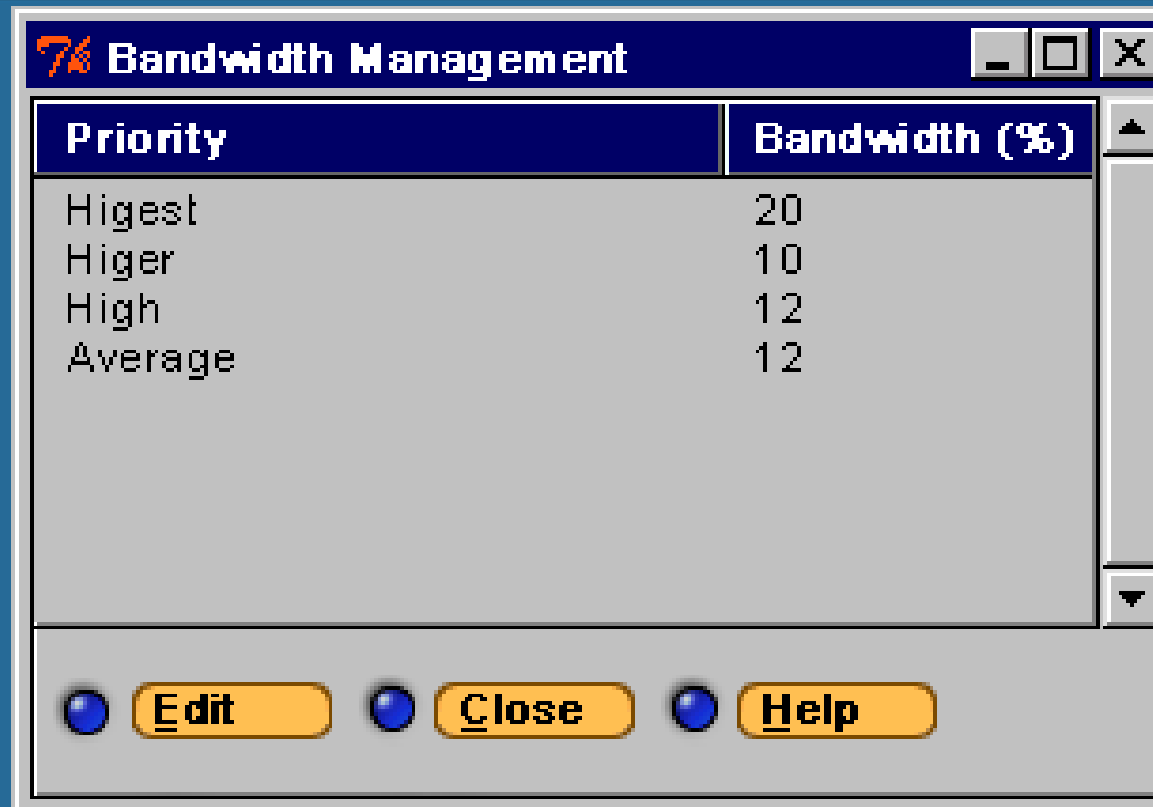
7/ Edit Window [min] [max] [close]

Relative Directory	<input type="text"/>
User Name	<input type="text"/>
Old Priority	<input type="text"/>
New Priority	<input type="text"/> ▼



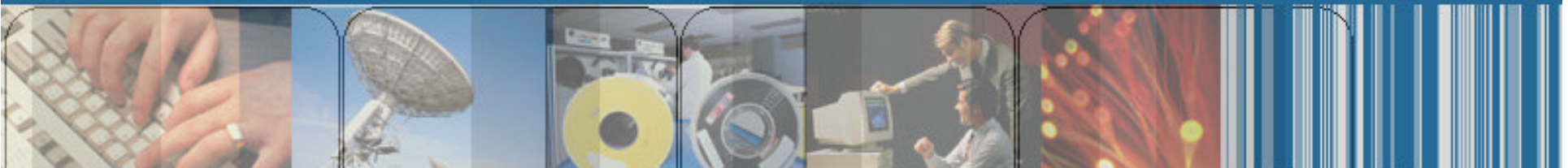
Net Pacer (Web)

Bandwidth Management



Priority	Bandwidth (%)
Highest	20
Higer	10
High	12
Average	12

Edit **Close** **Help**



Net Pacer (Web)

76 http

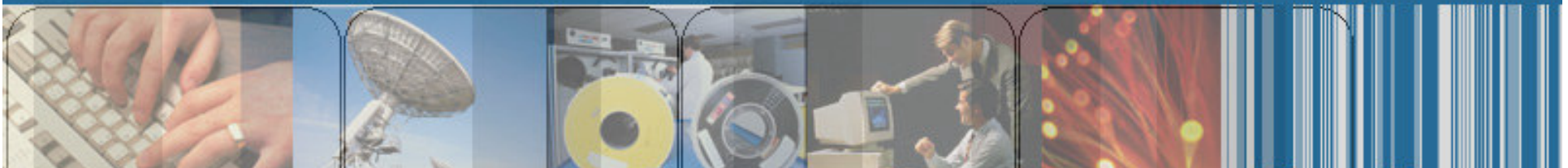
HTTP Configuration Wizard

URL

PRIORITY

URL Name	PRIORITY
http://www.usa.net	Highest
http://www.yahoo.com	Higher
http://www.msn.com	Average
http://www.aol.com	Best Effort
http://www.google.com	Average

ADD DEL EDIT CLOSE HELP



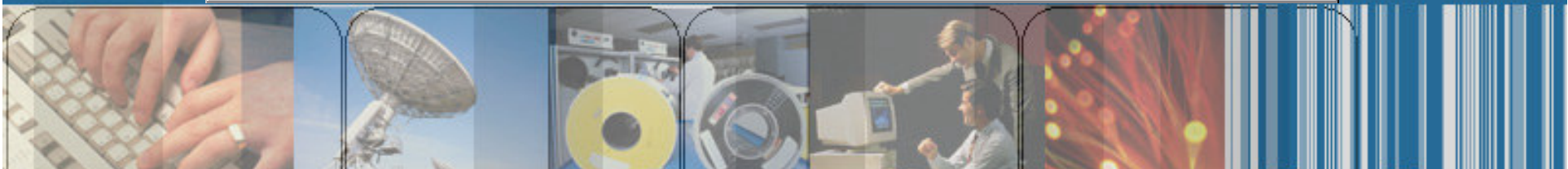
Net Pacer (Web)

76 Users Registered [Min] [Max] [Close]

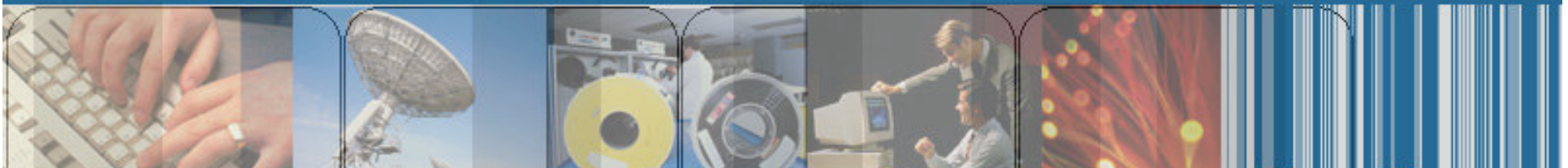
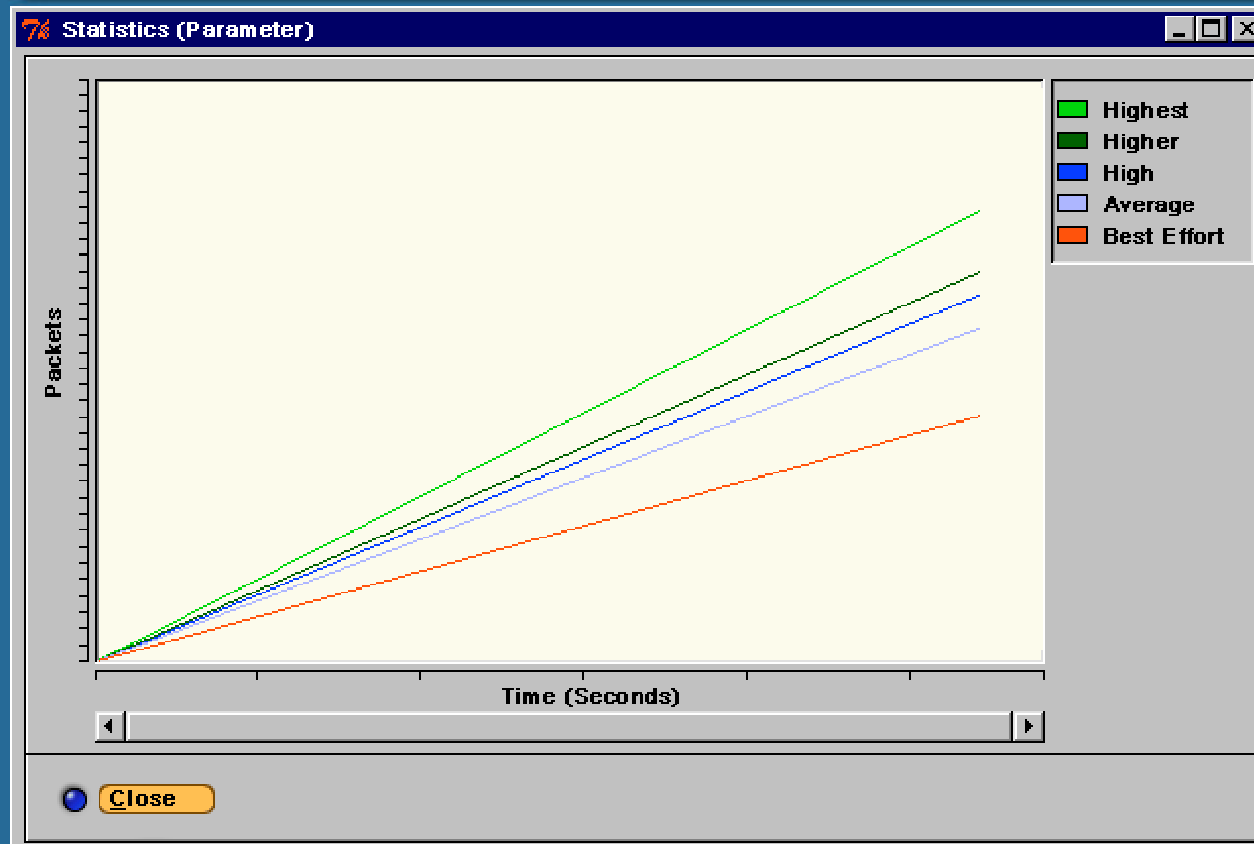
Relative Directory

User Name	Priority
XXXXXXXXXXXXXXXXXXXXXXXXXXXX	High
XXXXXXXXXXXXXXXXXXXXXXXXXXXX	Higher
XXXXXXXXXXXXXXXXXXXXXXXXXXXX	Best Effort
XXXXXXXXXXXXXXXXXXXXXXXXXXXX	Average
XXXXXXXXXXXXXXXXXXXXXXXXXXXX	High
XXXXXXXXXXXXXXXXXXXXXXXXXXXX	Average
XXXXXXXXXXXXXXXXXXXXXXXXXXXX	High
XXXXXXXXXXXXXXXXXXXXXXXXXXXX	Average
XXXXXXXXXXXXXXXXXXXXXXXXXXXX	High
XXXXXXXXXXXXXXXXXXXXXXXXXXXX	Average

[Edit] [Delete] [Close] [Help]



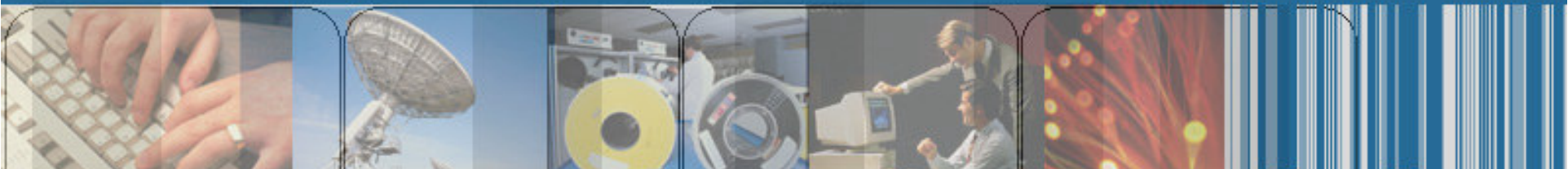
Net Pacer (Web)



Net Pacer (Web)

76 Statistics (All)

Priority	Average Delay (Microsec)	Max. Queue Length (Bytes)	Packets Transmitted	Bytes Transmitted	Overlimit Packet	Packets Dropped	Queue Length (Bytes)
Highest	336	63300	509	33763	0	0	0
Higher	456	61440	450	31006	0	0	0
High	336	63300	509	33763	0	0	0
Average	456	61440	450	31006	0	0	0
Best-Effort	336	63300	509	33763	0	0	0
Highest	456	61440	450	31006	0	0	0
Higher	336	63300	509	33763	0	0	0
High	456	61440	450	31006	0	0	0
Average	336	63300	509	33763	0	0	0
Best-Effort	456	61440	450	31006	0	0	0
Highest	336	63300	509	33763	0	0	0
Higher	456	61440	450	31006	0	0	0
High	336	63300	509	33763	0	0	0
Average	456	61440	450	31006	0	0	0
Best-Effort	336	63300	509	33763	0	0	0
Highest	456	61440	450	31006	0	0	0
Higher	336	63300	509	33763	0	0	0
High	456	61440	450	31006	0	0	0



Thank you

