Packeteer’s PacketShaper®

Unpredictable application performance undermines business performance. Large emails, peer-to-peer downloads, and web browsing can swamp mission-critical applications such as Oracle or SAP. PacketShaper is the solution for eliminating these problems. PacketShaper is the bandwidth-management solution that brings efficient performance to applications running over wide-area networks and the Internet. With PacketShaper, you can control performance to suit applications’ characteristics, business requirements, and users’ needs. Then you can validate the results by utilizing PacketShaper’s extensive reporting features.

**Ensure Critical Application Performance**
PacketShaper’s four-step approach to safeguarding application performance controls congested WAN access links.

**Control Non-Urgent Traffic**
PacketShaper goes beyond static port-matching and IP address schemes. Its layer-7 classification capabilities pinpoint hundreds of applications, from Oracle and SAP to Gnutella and KaZaA.

**Maximize WAN Throughput**
PacketShaper provides detailed analysis of application performance and network efficiency, describing peak and average bandwidth utilization, response times divided into network and server delays, top users, top web pages, top applications, and more.

**Align Application Performance With Business Goals**
PacketShaper’s TCP Rate Control technology proactively prevents congestion on both inbound and outbound flows, eliminates unnecessary packet discards and retransmissions, and forces a smooth, even flow rate that maximizes throughput. In addition, PacketShaper's UDP Rate Control technology effectively controls UDP-based applications.

**STEP ONE:** PacketShaper automatically classifies network traffic into categories based on application, protocol, subnet, URL, and other criteria — yielding thousands of potential categories.

**STEP TWO:** PacketShaper provides detailed analysis of application performance and network efficiency, describing peak and average bandwidth utilization, response times divided into network and server delays, top users, top web pages, top applications, and more.

**STEP THREE:** With policy-based bandwidth allocation and traffic shaping, PacketShaper protects critical applications, paces those that are less urgent, and optimizes performance of a limited WAN-access link. You specify bandwidth minimums and/or maximums on a per-session or per-application basis.

**STEP FOUR:** PacketShaper has extensive reporting capabilities: reports, graphs, statistics, and SNMP MIBs. With service-level agreements, you can define performance standards, compare actual performance with service-level goals, and generate reports on compliance.
PacketShaper & Your Network

PacketShaper brings application-based bandwidth management to a variety of business environments.

The PacketShaper 1500 series is designed for small branch offices and remote sites. The PacketShaper 2500 series handles large branch offices or mid-sized corporate data centers. The PacketShaper 4500 series is designed for larger sites such as corporate data centers. And finally, the PacketShaper 6500 and 8500 series are the highest-capacity platforms intended for the largest data centers.

PacketShaper supports multiple 10/100 Mbps and 10/100/1000 Mbps Ethernet LAN interfaces and is installed on the LAN segment that connects to a WAN router. It integrates smoothly with existing networks and requires no new protocols, router reconfigurations, topology changes, or desktop changes. PacketShaper is not a point of network failure; if it goes down or is turned off, it acts like a piece of cable. Two PacketShapers can be deployed in parallel to provide redundancy and a hot standby. An easy web-based, password-protected interface brings PacketShaper to any web browser. PolicyCenter™, a Packeteer software product, conveniently provides centralized management for large PacketShaper deployments.

Examples of Applications That PacketShaper Classifies & Controls

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<th>Legacy LAN and Non-IP</th>
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<td>AFS</td>
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<td>Folding@Home</td>
<td>MS SQL</td>
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<td>ICMP by packet type</td>
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<tr>
<td>FIX (Finance)</td>
<td>Oracle 7/8i</td>
<td>Lockd</td>
<td>Microsoft SMS</td>
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<td>Java Rmt Mthd</td>
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<td>NetBIOS-IP</td>
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<tr>
<td>MATIP(Airline)</td>
<td></td>
<td>IPS</td>
<td>Real Audio Streamworks</td>
<td>EGP</td>
</tr>
<tr>
<td>MeetingMaker</td>
<td></td>
<td>NFA</td>
<td>RTP</td>
<td>EIGRP</td>
</tr>
<tr>
<td>NetIQ AppMgr</td>
<td></td>
<td>LAT</td>
<td>RTSP</td>
<td>IGMP</td>
</tr>
<tr>
<td>OpenConnect-JCP</td>
<td></td>
<td>NetBEUI</td>
<td>OSPF</td>
<td>IGP</td>
</tr>
<tr>
<td>SunRPC</td>
<td></td>
<td>MOP-DL/RC</td>
<td>PIM</td>
<td>OSPF</td>
</tr>
<tr>
<td>(dyn port)</td>
<td></td>
<td>SNA</td>
<td>RARP</td>
<td>SHOUTcast</td>
</tr>
</tbody>
</table>

**Examples: ERP**
- Baan
- JavaClient
- JD Edwards
- Oracle
- SAP

**Examples: Internet**
- ActiveX
- FTP
- Passive FTP
- Gopher
- IP, UDP, TCP
- IPv6
- IRC
- Mime type
- NNTP
- SSHTCP
- SSL
- TFTP
- UUCP
- URL
- Particular web browsers

**Examples: Database**
- FileMaker Pro
- MS SQL
- Oracle 7/8i
- Progress

**Examples: Directory Services**
- CRS
- DHCP
- DNS
- DPA
- Finger
- Idnet
- Kerberos
- LDAP
- RADIUS
- TACACS
- WINS
- whois

**Examples: Games**
- Asheron’s Call
- Battle.net
- Diablo II
- Doom
- Kali
- Half-Life
- MSN Zone
- Quake I, II, & III
- Starsiage
- Tribes
- Unreal
- Yahoo! Games

**Examples: Messaging**
- AOL Inst Msnger
- I See You Chat
- MSN Messenger
- Yahoo! Messenger

**Examples: Music P2P**
- Aimster
- AudioGalaxy
- eDonkey2000
- Gnutella
- iMesh
- KaZaA
- LimeWire
- Morpheus
- MusicCity
- Napster
- Scour
- WinMX

**Examples: Networking**
- Print
- LPR
- IPP
- TN52500
- TN9287

**Examples: Push**
- Backweb
- EntryPoint
- Marimba
- PointCast

**Examples: Routing**
- AURP
- BGP
- CBT
- DRP
- EGP
- EIGRP
- IGMP
- IGP
- OSPF
- PIM
- RARP
- RIPv2
- Spanning Tree

**Examples: Security Protocol**
- DLS
- DPA
- GRE
- IPSec
- ISAKMP/IKE
- key exchange
- L2TP
- PPTP
- SOCKS Proxy

**Examples: Session**
- REXEC
- rlogin
- rsh
- Telnet
- Timbuktu
- VNC
- Xwindows

**Examples: Thin Client or Server-Based**
- Citrix
- Published Apps
- VideoFrame
- RDP/Terminal Server

**Examples: Streaming Media**
- Multi-cast
- NetShow
- QuickTime
- RTP
- Real Audio
- Streamworks
- RTSP
- MPEG
- ST2

**Examples: Voice over IP**
- Clarent
- CUSeeMe
- H.323
- I-Phone
- MCK Commun.
- Micom VIP
- RTP
- RTCP
- T.120
- VDOPhone
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **Traffic Classification**      | Classify traffic by application, protocol, port number, URL or wildcard, host name, LDAP host lists, Diffserv setting, ISL, 802.1p/q, MPLS tag, IP precedence bits, IP or MAC address, direction (inbound/outbound), source, destination, host speed range, Mime type, web browser, Oracle database, Citrix published application, and VLAN. Detect dynamic port assignments, track transactions with migrating port assignments, and differentiate among applications using the same port. | — SAP traffic to/from a specific server  
— Oracle traffic to the sales database  
— Web traffic to e-commerce site from Netscape browser  
— Gnutella downloads  
— Passive FTP  
— PeopleSoft running on Citrix |
| **Response-Time Analysis and Management** | Track response times, divided into server and network delays.  
Identify clients and servers with slow performance.  
Find out who generates or receives the most traffic of a given type.  
Discover the percentage of bandwidth wasted by retransmissions. Correlate dropped packets with their corresponding applications or servers.  
View more than 30 other measured variables. | SAP response times:  
Total Delay: 630 ms  
Server Delay: 210 ms  
Network Delay: 420 ms  
Top Talkers for web traffic: yahoo.com, nasdaq.com, cnn.com, and espn.com  
Top Listeners: CfoPC, VpMarketingPC, DirEngineeringPC  
12% of bandwidth goes to retransmissions; jumps to 68% for a particularly overburdened server. |
| **Service-Level Agreements**   | Set response-time commitments in milliseconds. Measure and track service-level compliance.                                                                                                                                                  | SLA states that 98% of JD Edwards’ OneWorld transactions should complete in 1,100ms. Actual response time averages 867ms. But only 95% complete within limits, so SLA is in violation. |
| **Top 10**                     | Zero in on the traffic types that generate the most traffic. Top Ten helps users spot trouble and fix it – quickly and without a big learning curve.                                                                                   | 46% of bandwidth goes to web browsing, 22% to music downloads, 12% to MS Exchange, and 7% to SAP.                                                                                                               |
| **Per-App Minimum**            | Protect all the traffic in one class. You specify the size of the reserved virtual link, choose if it can exceed that size, and optionally cap its growth.                                                                                     | Reserve a minimum of 20% of the WAN link for MS Exchange. Allow Exchange to exceed the minimum if bandwidth is available, but cap it at 60% of the link.                                                             |
| **Per-App Maximum**            | Cap all the traffic in one class. Even when the traffic bursts, other applications are not impacted.                                                                                                                                                                  | Limit FTP total to 128 Kbps in a T1 link.                                                                                                                                                                 |
| **Per-Session Minimum**        | Protect latency-sensitive sessions. Deliver a minimum rate for each individual session of a traffic class, allow that session prioritized access to excess bandwidth, and set a limit on the total bandwidth it can use.                                              | Reserve precisely 21 Kbps for each VoIP session to avoid jitter and static.                                                                                                                                   |
| **Per-Session Maximum**        | Keep greedy traffic sessions in line.                                                                                                                                                                                                                                                                    | Cap each FTP download at 10 Kbps.                                                                                                                                                                             |
| **Dynamic Per-User Minimum & Maximum** | Dynamically control per-user bandwidth without need for tedious per-user configuration. Unused bandwidth is loaned to others.                                                                                                                                                      | Give each dormitory student a minimum of 20 Kbps and a maximum of 60 Kbps to use any way he/she wishes.                                                                                                          |
| **TCP Rate Control**           | Force a smooth, even flow rate that maximizes throughput. Reduce latency on both inbound and outbound traffic.                                                                                                                                               | Measure network latency; forecast packet inter-arrival times; adjust window size accordingly; meter acknowledgement to ensure just-in-time delivery.                                                       |
| **UDP Rate Control**           | Manage inbound and outbound UDP traffic to a very specific rate, guarantee precise amounts of bandwidth, and control jitter.                                                                                                                                 | VoIP requires a minimum amount of bandwidth, and PacketShaper provides the precise amount to de-jitter flows and ensure reliable performance.                                                              |
| **Denial-of-Service Attack Avoidance** | Use classification and control features to contain DoS attacks. Detect and stop SYN floods or similar DoS attacks.                                                                                                                                                  | Detect and block ICMP variants that can plant malicious instructions. Block flows to the KeySales web server after 15,000 flows-per-minute exceeded.                                                             |
## Software Specifications

### Classification Features
- Application, protocol
- Subnet(s), user(s), server(s), IP Precedence, DiffServ, port, ISL, IPv4/IvP, MPLS tag, VLAN, or MAC addresses, host speed
- URL, Oracle database, Citrix Published Application, web browser

### Analysis and Reporting Features
- Application response times: server and network delays
- Network efficiency, utilization, bytes transferred
- TCP health, packets
- Top users, top applications, top web sites
- Slowest clients and servers
- Retransmissions, errors
- More than 30 other measured variables

### Interoperability Features
- XML, DiffServ, BGP, IGMP, OSPF, DMVPN, event-based traps
- HP OpenView and PolicyXpert, Micromuse NETCOOL, InfoVista, Concord eHealth, Aphisma Spectrum, and other third-party products

### QoS Policy Features
- Bandwidth settings: Minimum guaranteed; Maximum allowed
- Choice of explicit bps, relative priority, absolute priority
- Bandwidth settings can apply to individual applications, users, groups, VLANs, or combinations
- Bandwidth settings can apply to aggregate total or each flow/session
- DiffServ and 802.1p/q packet-marking for signaling QoS in network core
- TCP Rate Control
- UDP Rate Control
- Admissions rate control

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## Hardware Specifications

### Dimensions
- Standard 19-inch rack mount
- Height: PS 1500: 1.75 in (4.45 cm)
- PS 2500, 4500, 6500, 8500: 3.5 in (8.89 cm)
- Weight: PS 1500: 13 lb (5.90 Kg); PS 2500, 4500, 6500, 8500: 16 lb (7.26 Kg); PS 8500: 30 lb (13 Kg)
- Width: PS 1500, 2500, 4500, 6500, 8500: 17.20 in (43.69 cm)
- Depth: PS 1500: 14 in (35.56 cm); PS 2500, 4500, 6500: 15.3 in (38.7 cm, incl. handles); PS 8500: 17 in (43 cm)

### Power
- PS 1500, 2500, 4500, 6500: 100/240 VAC, 50/60 Hz, 2A
- PS 8500: 100/240 VAC, 50/60 Hz, 6A
- PS 4500, 6500: Dual, redundant, load-sharing power supplies and dual power source connections
- PS 8500: Dual, redundant, load-sharing, hot-swappable power supplies and dual power source connections

### Interface Connections
- Console port: RS-232 (AT-compatible), male DB-9 connectors
- Network interface: PS 1500, 2500, 4500, 6500: 10/100 Mbps Ethernet RJ45; PS 8500: 10/100/1000 Mbps Ethernet RJ45
- PS 2500, 4500, 6500, 8500: 2 PCI slots

### Device Management
- DB-9 console port
- Web-browser interface; Telnet command-line interface
- SNMP Packeteer MIB and MIB-II support

### Agency Approval
- Safety: CAN/CSA-C22.2 No. 1950-95/UL 1950, IEC 60950, EN 60950
- Emissions: BSMI CNS 13438, CE EN55022, C-TICK (AS/NZS 3548), FCC Part 15, VCCI
- Immunity: EN 55024, EN 61000-3-2, EN 61000-3-3

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### Control Cap

<table>
<thead>
<tr>
<th></th>
<th>Max Classes</th>
<th>Max Partitions</th>
<th>Dynamic Partitions</th>
<th>Max Policies</th>
<th>Max IP Hosts*</th>
<th>Max IP Flows*</th>
<th>Upgrades Available</th>
</tr>
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<tbody>
<tr>
<td><strong>PacketShaper 1500</strong></td>
<td></td>
<td></td>
<td></td>
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<td>Monitor only</td>
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<td>0</td>
<td>0</td>
<td>5,000</td>
<td>5,000/2,500</td>
<td>To 1500: 128K, 512K, 2M</td>
</tr>
<tr>
<td>128 Kbps</td>
<td>256</td>
<td>128</td>
<td>**</td>
<td>256</td>
<td>5,000</td>
<td>5,000/2,500</td>
<td>To 1500: 512K and 2M</td>
</tr>
<tr>
<td>512 Kbps</td>
<td>256</td>
<td>128</td>
<td>**</td>
<td>256</td>
<td>5,000</td>
<td>5,000/2,500</td>
<td>To 1500: 2M</td>
</tr>
<tr>
<td>2Mbps</td>
<td>256</td>
<td>128</td>
<td>**</td>
<td>256</td>
<td>5,000</td>
<td>5,000/2,500</td>
<td>None</td>
</tr>
</tbody>
</table>

| **PacketShaper 2500**|              |                |                    |              |               |               |                   |
| Monitor only         | 256         | 0              | 0                  | 0            | 5,000         | 5,000/2,500   | To 2500: 2M and 10M |
| 2Mbps               | 256         | 128            | **                 | 256          | 5,000         | 5,000/2,500   | To 2500: 10M      |
| 10Mbps              | 512         | 256            | 512                | 512          | 10,000        | 20,000/10,000 | None             |

| **PacketShaper 4500**|              |                |                    |              |               |               |                   |
| Monitor only         | 512         | 0              | 0                  | 0            | 25,000        | 50,000/25,000 | To 4500: 10M and 45M |
| 10Mbps              | 512         | 256            | 512                | 512          | 25,000        | 50,000/25,000 | To 4500: 45M      |
| 45Mbps              | 512         | 256            | 512                | 512          | 25,000        | 50,000/25,000 | None             |

| **PacketShaper 6500**|              |                |                    |              |               |               |                   |
| Monitor only         | 1,024       | 0              | 0                  | 0            | 25,000        | 100,000/50,000 | To 6500: 100M     |
| 10Mbps              | 1,024       | 512            | 5,000              | 1,024        | 25,000        | 100,000/50,000 | None             |

| **PacketShaper 8500**|              |                |                    |              |               |               |                   |
| Monitor only         | 1,024       | 0              | 0                  | 0            | 100,000       | 200,000/100,000 | To 8500: 1,000 or 2,000 classes |
| 200Mbps             | 1,024       | 512            | 10,000             | 1,024        | 100,000       | 200,000/100,000 | To 8500: 2,000 classes |
| 200Mbps             | 2,048       | 1,024          | 20,000             | 2,048        | 100,000       | 200,000/100,000 | None             |

*Note: PacketShaper can support more hosts and flows, however these figures represent ideal maximums for producing optimal results. Figures represent TCP and other IP flows respectively. **No extra partitions are specifically allocated for dynamic partitions. This model can have a maximum of 128 partitions, which can be a combination of static and dynamic partitions.*

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