



# Fair Usage

Manage subscriber traffic fairly to enhance Quality of Experience

## Use Cases for Fair Usage of broadband networks

Procera's sophisticated traffic management and subscriber awareness deliver higher QoE during network congestion.

### Heavy User Management with Fair Usage

Ensure consistent Quality of Experience for all users during heavy usage periods by providing equal access to bandwidth for all subscribers during times of congestion.

### Service Plan Tiered Fair Usage

Tiering of Fair Usage based on service plan levels during heavy usage periods to align network resources to subscriber ARPU.

### Application Aware Fair Usage

Differentiated treatment of classes of applications to ensure that the QoE expectations of each application type can be met, in accordance with EU Network Neutrality guidelines.

### Tiered Video Resolution Plans

Manage streaming video QoE and bandwidth consumption based upon subscriber tiers and desired video resolution.

## SOLUTION OVERVIEW

Network operators worldwide are struggling to deliver high quality broadband to their subscribers, whether they are fixed, mobile, WiFi or satellite. With the massive growth in streaming video, social networking, and cloud services, the demands on access networks during peak hours are increasingly difficult to meet without massive CAPEX investments. Procera's Fair Usage solutions enable network operators to maximize the ROI on their existing network infrastructure while meeting or exceeding their subscriber's quality expectations for application quality.

Procera's Fair Usage solutions take advantage of not only Procera's industry-leading application intelligence and advanced queue management, but also a broad set of integrations with network and subscriber attributes to provide contextual, real-time traffic management tailored to fit network and regulatory needs. In addition to managing congestion, Procera's Engineering Insights and ScoreCard measure the effects of traffic management to provide a feedback loop on network quality for the operator.

## USE CASE TECHNOLOGY OVERVIEW

All of the Fair Usage Use Cases are designed to ensure that all subscribers have access to some level of bandwidth during times of congesting and during peak hours. Procera's technology can scale from a single WiFi access point with a few users to a mobile network with millions of simultaneous active users, and is based on our advanced queue management combined with Fair Split and Fair Factor algorithms.

Fair Split ensures that each active subscriber is given an equal portion of the available bandwidth on the network at any instant. Any bandwidth not used by subscribers is made available to the rest of the subscribers on that network segment, ensuring that maximum efficiency is gained from the existing network infrastructure. During times of congestion, Fair Split prevents heavy users from negatively impacting the quality of experience for other subscribers.

Fair Factor builds on Fair Split, adding the ability to tier the bandwidth available to subscribers on different service plans. Instead of allowing all subscribers equal access to bandwidth, Fair Factor enables the operator to configure the proportion of bandwidth available for each service plan. In a network with four service tiers, the highest service tier might be given access to 4/10 of the bandwidth, the next 3/10, then 2/10 and the final plan 1/10 - ensuring that all subscribers have access to some bandwidth, but the high ARPU subscribers (who are usually paying for more bandwidth) have access to a greater share of the overall bandwidth. As with Fair Split, any bandwidth not used by a service tier is made available to the other tiers to minimize bandwidth waste.



## USE CASE COMPONENTS

### Mandatory Licenses

- PacketLogic Base
- DRDL & Signatures
- Congestion Management & Filtering
- Access Deployment Type

### Optional Licenses

- Integration for Enrichment
- BGP Integration
- Engineering Insights
- ScoreCard
- Insights Storage
- Policy Enforcement w/Gx

## USE CASES

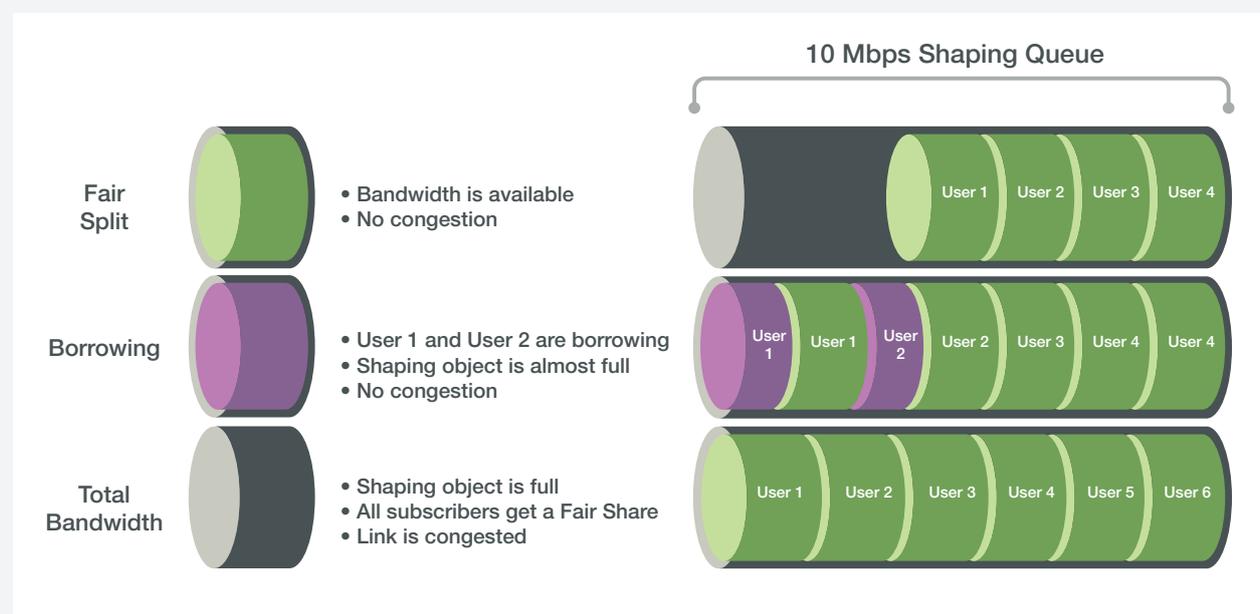
There are multiple deployment options for implementing Fair Usage with PacketLogic software. All Use Cases rely on the PacketLogic Base software, DRDL & Signatures, and the Congestion Management & Filtering Licenses, and optional software licenses can be added to provide more subscriber and service options. The use cases range from simple heavy user management to more sophisticated tier models that provide business flexibility for operators to ensure high quality of experience for high ARPU users.

### Heavy User Management with Fair Usage

The base fair usage use case is to equally divide the available bandwidth between all active subscribers on any segment during times of congestion. In many networks, 20% of the subscribers consume 80% of the bandwidth, so ensuring that these heavy users do not consume all the bandwidth and degrade the quality of experience for the rest of the users. When enriched with subscriber and location awareness, PacketLogic tracks the active subscribers as well as the congestion levels on the network segments. During congestion, PacketLogic will divide the available bandwidth among the active subscribers equally to ensure that each subscriber has access to a consistent bandwidth allotment (which is especially important for video streaming quality). If any subscribers do not use their bandwidth allotment, it will be placed back in the pool for other subscribers to use, maximizing throughput for the heavy users. As Fair Usage is applied to the traffic, PacketLogic is collecting statistics on throughput, latency, and packet loss for all subscribers to provide the operator with visibility that can be visualized in Engineering Insights and ScoreCard.

Figure 1

### FAIR SPLIT DIAGRAM WITH PACKETLOGIC





<b>Broadband Facts</b>			
Mobile broadband consumer disclosure			
<b>Device Compatibility</b>			
If you want to use your existing device, learn more about <a href="#">compatibility</a> .			
If you want to obtain a device, learn more about <a href="#">prices and other options</a> .			
<b>Choose Your Data Plan</b> - These prices do not include costs for obtaining a device from us.			
	High Speed Data allowance per month		
	1GB	3GB	5GB
Monthly charge	<b>\$35.00</b>	<b>\$45.00</b>	<b>\$60.00</b>
When you exceed the data allowance	<b>\$10.00/Additional GB</b>	<b>Slowed speeds</b>	<b>NA</b>
Learn more about <a href="#">other included services/features</a> .			
Additional pricing options, plans and promotions can be found <a href="#">here</a> .			
<a href="#">Coverage Map</a>			
<b>Charges and Terms Common to All Plans</b>			
Monthly fees			
Administrative fee			<b>\$1.20</b>
Regulatory fee			<b>\$0.13</b>
One-time fees			
Activation fee			<b>\$50.00</b>
Deposit			<b>\$50.00</b>
Early termination fee			<b>\$240.00</b>
<b>Government Taxes and Fees, and Other Carrier Surcharges May Also Apply:</b> Varies by location			
<b>Performance</b> - Individual experience may vary			
	3G	4G	
<b>Typical speed</b>	1.5 Mbps downstream / 600-900 Kbps upstream	•	<b>Typical Speed</b> 6-12 Mbps downstream / 3-6 Mbps upstream
<b>Typical latency</b>	Less than 120 milliseconds	•	<b>Typical latency</b> Less than 120 milliseconds
<b>Typical Packet Loss</b>	0.08%	•	<b>Typical Packet Loss</b> 0.08%
<b>Network Management</b>			
Application-specific network management practices?			<b>Yes</b>
Subscriber-triggered network management practices?			<b>Yes</b>
<a href="#">More details on network management</a>			
<b>Privacy</b>			See our <a href="#">privacy policy</a>
<b>Complaints or Inquiries</b>			To contact us: <a href="#">online</a> /(123)456-7890; To submit complaints to the FCC: <a href="#">online</a> /(888)225-5322
Learn more about the <a href="#">terms used on this form and other relevant information</a> at the FCC's website.			

## Service Plan Tiered Fair Usage

Service Plan Tiered Fair Usage adds service plan awareness to fair usage, enabling the operator to ensure that high ARPU subscribers receive a high quality of experience commensurate to the bandwidth plans that they have purchased. In most networks, subscribers purchase either usage or bandwidth tiers that define their broadband experience. A tiered fair usage implementation requires real-time knowledge of each subscriber's service tier and their location to dynamically create software queues for each active subscriber.

Procera's unique Fair Factor implementation combined with Fair Split enables the operator to grant a higher proportion of the network's available bandwidth to the higher service tiers. This is especially important when broadband operators are trying to meet their SLAs for the higher bandwidth service tiers and measure their performance (as the FCC's Broadband Labelling Initiative suggests) for reporting/marketing to subscribers and regulators. Procera's ScoreCard solution can measure the actual performance of each subscriber and service plan to guide the operator's infrastructure investments and marketing of services to maximize their ROI.

## Application Aware Fair Usage

Not all applications require the same network resources to achieve a high quality of experience. Real-time applications like VOIP and gaming need low latency connections, and streaming video requires high bandwidth to keep high resolution streams from buffering or stalling. Fair usage plans can add application prioritization and weighted fair queuing to balance the effect of heavy traffic against priority traffic within the fair usage queues.

The Network Neutrality guidelines from the European Union's BEREC specifically call out this as an allowed traffic management technique to enable broadband operators to meet the quality expectations of subscribers and their favorite applications. Adding application awareness to the fair usage solutions enables an operator to either treat specific application classes (like VOIP and Video streaming) priority in each subscriber's queues, or to allow each subscriber to determine what priority they want applied to their fair usage policy during congestion. This is a powerful solution to market as a differentiator to subscribers, and it can be delivered through a custom portal integrated with the broadband operators customer care offering.

## Tiered Video Resolution Plans

Operators are struggling with the proliferation of OTT video traffic. A solution to offer consistent video quality for OTT video traffic on the broadband operator's network is to enable congestion management and/or service differentiation by controlling different levels of video quality. PacketLogic can implement policies to limit the video bandwidth for subscribers based on subscriber or product tier, congestion, time of the day, or device type.

This type of offering delivers the operator better control over limiting the effect of video traffic on the network and also offers up-sell opportunities for the subscriber to buy up to a higher plan tier for higher resolution video services. It also ensures that consistent video quality is delivered to adaptive bit rate video streaming applications so that stalls and buffering do not degrade the subscriber experience.



Procera Networks delivers highly scalable Fair Usage solutions leveraging sophisticated queuing technology combined with subscriber, location, service plan, and application awareness.

#### Procera's Unique Benefits for Fair Usage

- **Industry Leading Queuing Technology and Scalability**

PacketLogic scales to support millions of dynamically created software queues, supporting deployments in the largest fixed and mobile networks in the world. Active Queue Management is used to manage congestion, resulting in shorter queue lengths, combating buffer-bloat and reducing overall network latency to enhance quality of experience. PacketLogic's queuing technology increases the "goodput" on the network, maximizing the usage of existing network investments and delaying CAPEX to increase profitability.

- **Tiered Service Plan Fair Usage using Fair Factor**

Not all subscribers are equal value to broadband operators. Tiered Fair Usage ensures that an operator is meeting their SLAs to high ARPU subscribers and preventing churn due to bad experiences during times of congestion. It also prevents pre-paid or low ARPU subscribers from negatively impacting high ARPU subscriber's quality of experience with file downloads or video streaming.

- **Application Awareness to deliver a high Quality of Experience**

Procera's application intelligence powered by the DRDL engine delivers the industry's most granular and comprehensive signatures database. Since different application types have different requirements for network quality, applying application awareness to fair usage ensures that the perceived quality of experience for key applications can be met or exceeded.

- **Quality of Experience Analytics with Engineering Insights and ScoreCard**

Measuring the delivered quality of experience is critical to guiding investments in network infrastructure. Engineering Insights identifies key trends in service demographics for subscribers, and ScoreCard focuses on the quality of experience delivered to subscribers.

#### CONCLUSION

Procera's Fair Usage solutions deliver industry-leading scalability and value to broadband operators and subscribers. With operators and subscribers increasingly focusing on network quality as a competitive differentiator, it is critical to ensure that each subscriber's quality of experience meets the marketing of the service plan that the operator promises. Broadband operators need to ensure that they are maximizing the ROI for their CAPEX spend by investing in the network where the biggest impact on QoE can be achieved.



Contact your Procera sales representative to find out more about this solution and how it can help you transform your business.

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#### ABOUT PROCERA NETWORKS

Procera Networks, the global Network Intelligence company, is revolutionizing the way operators and vendors monitor, manage and monetize their network traffic. Elevate your business value and improve customer experience with Procera's sophisticated intelligence solutions. For more information, visit [proceranetworks.com](http://proceranetworks.com) or follow Procera on Twitter at [@ProceraNetworks](https://twitter.com/ProceraNetworks).



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