

## Sandvine Fairshare Traffic Management

All networks experience congestion.

Do you manage your network fairly and effectively?

Users' bandwidth demands on the network are growing rapidly, with video and peer-to-peer (P2P) traffic comprising the two largest application categories by bandwidth. Internet usage patterns are by no means uniform, with a small minority of users using a disproportionate amount of the bandwidth. This small minority has the potential to adversely affect the experience of many other users at times of peak demand. In terms of user experience, congestion impacts different applications differently and highly time-sensitive applications are most in need of being protected against latency and jitter variations.

Service providers need a solution that gives them maximum control and flexibility over which users and applications would be affected, what conditions would trigger actions to be taken, and what the consequent traffic enforcement actions would be. They also need detailed monitoring and feedback on the results of their policies for both customer support and network planning.

### Solution Highlights

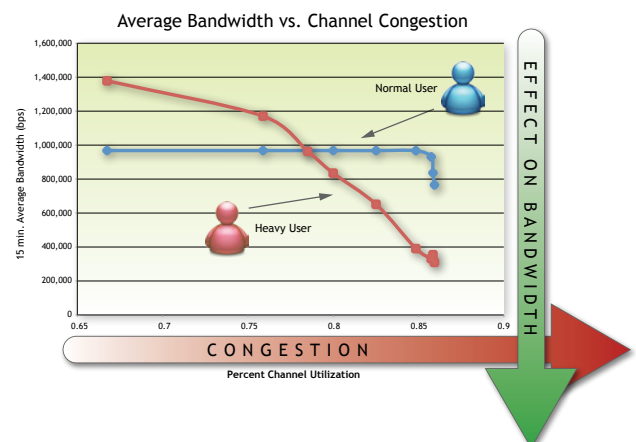
Sandvine Fairshare Traffic Management is the industry's most complete product for ensuring optimal bandwidth usage per subscriber, consistent with the service provider's subscription packages. It supports the operator's goal of maintaining a high subscriber quality of experience while deferring capital expenditure. Its features include:

- Network policy decision and enforcement that alleviates congestion instead of requiring additional network capacity
- Improved subscriber quality of experience leads to reduction in churn and customer service costs
- Unobtrusive but fair management of congestion events
- Support for transparent fair-use terms, with explicit prioritization or shaping policies, per offered subscriber service package
- Full reporting on user-specific policy events

Fairshare Traffic Management gives service providers an exceptional degree of control over policy conditions, by allowing the operator to:

- Apply usage-based policies to the small minority of heavy users that consume very high bandwidth. This can be done for all traffic or by application, and either on its own, or in combination with application prioritization.
- Combine per-user and aggregate traffic management for better peak period behaviors.
  - For example, guarantee quality of service for VoIP traffic at all times and constrain per-user bandwidth for P2P and other non-time-sensitive traffic when congestion is detected.
- Provide new service packages, offering users different priority levels for different application traffic.
  - This gives users choices as to how their applications will be prioritized under congestion conditions and gives the service provider the opportunity to obtain greater revenue from those service packages that are more demanding on the network.

The above diagram depicts the impact of a Fairshare policy applied to a heavy user, when 65% network congestion level is reached, steadily decreasing the heavy user's bandwidth usage while congestion increases, thus maintaining the majority normal user's quality of experience until maximum 85% network load is reached.

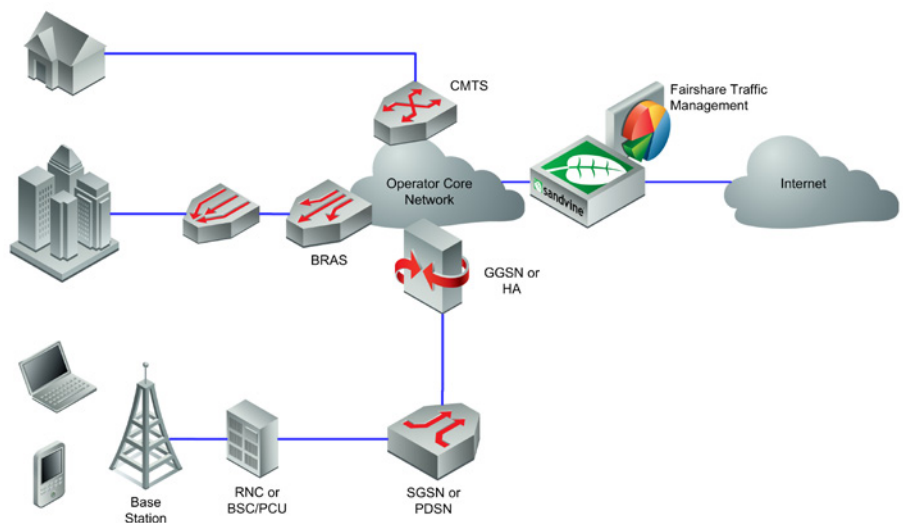


## Benefits:

- Fairness
  - Ensures that the primary effect of any congestion is re-apportioned to the appropriate heavy users
  - Improves the overall user experience
- Network Efficiency
  - Allows the network to run closer to engineering limits without impairing service quality for the broad user base
  - Allows deferment of investment for network capacity expansions
  - Provides sophisticated control over unpredictable peak demand
- Market Planning
  - Reduces customer churn by improving quality of experience for vast majority
  - Monitors heavy users and can modify service parameters in real time
- Customer Support
  - Reports on who was policed, when, and why
  - Reduces customer support calls by enhancing subscribers' quality of experience through targeted and explicit policies

## Network Implementations

**Cable:** Fairshare is deployed on the Sandvine Policy Traffic Switch (PTS) and Service Delivery Engine (SDE) platforms. Policy decisions are based on usage data collected at the PTS, as well as data from the SDE's IPDR/PCMM interface (for both DOCSIS3.0 and earlier implementations). Most effectively, the PTS performs downstream traffic management, while the SDE signals upstream policies to the CMTS. Users are mapped to the network topology to enforce congestion-sensitive policies and to provide detailed, valuable reporting of both usage and policies per resource.



**DSL and FTTH:** Fairshare works with an inline Sandvine PTS to monitor usage and apply policy via traffic marking or mirroring the network topology in the PTS and managing virtual links there.

**Mobile and Fixed/Nomadic Wireless:** Fairshare works with an inline Sandvine PTS to monitor usage and apply policy. Simple, peak period shaping of heavy users or applications is always possible. Sandvine Consulting Services can advise on the granularity of network topology awareness that can be provided to allow both more responsive policies and per-resource reporting.

### Sandvine Advantages:

- Performance and reliability for tier-one networks with multi-million subscribers. Progressive, multi-stage network policy control.
- Application agnostic or **application aware**, session and **subscriber aware policies**
- Management of any mix of applications in an aggregate, per-user, per-tier, and/or per-application set
- **Network topology awareness** with powerful, multi-stage, independent prioritization queues
- Comprehensive policy decision factors including usage history, policy history, **congestion state**
- Full DOCSIS 3.0 and related CableLabs® IPDR, PCMM and SNMP compliance for cable deployments
- Access infrastructure vendor agnostic, including interoperability with major CMTS vendors for cable