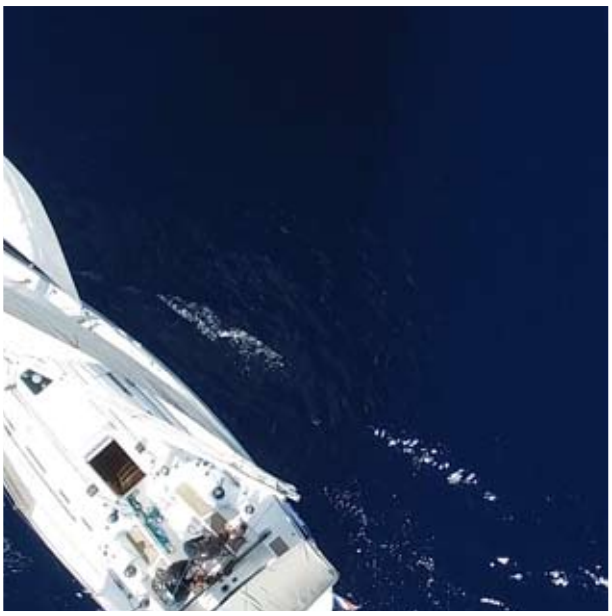
VSAT Test

Case study



SMARTSHARE SYSTEMS

SmartShare Systems A/S I Tonsbakken 16-18 I DK-2740 Skovlunde I +45 70 20 00 93 I www.smartsharesystems.com

Testing SmartShare StraightShaper Satellite 4000 with VSAT

AGC MARINE TELECOM wanted to know how much of an improvement it would be, connecting a StraightShaper Satellite 4000 to their equipment. The results of the test spoke for themselves.

AGC MARINE TELECOM are specialists in the field of marine electronics and telecom. The company, founded by british Clive Widdowson, supply the naval market with high quality equipment, as well as taking care of installations and support. To complete their customers needs, the company also offers VSAT contracts that cover Europe, USA, the Caribbean, United Arab Emirates plus the Atlantic.

The company, situated in Antibes at the heart of the French Riviera, naturally service a large amount of privately owned luxury yachts. These superior beauties demand first class equipment, as well as a first class service.

Always looking for ways to improve their portfolio and services, AGC MARINE TELECOM invited SmartShare Systems to set up a test. They wanted to verify that SmartShare StraightShaper 4000 Satellite performed with an optimal User Load Balancing and improved the internet user experience on a VSAT connection.

Test setup
The test was performed on a Eutelsat VSAT connection with following equipment:

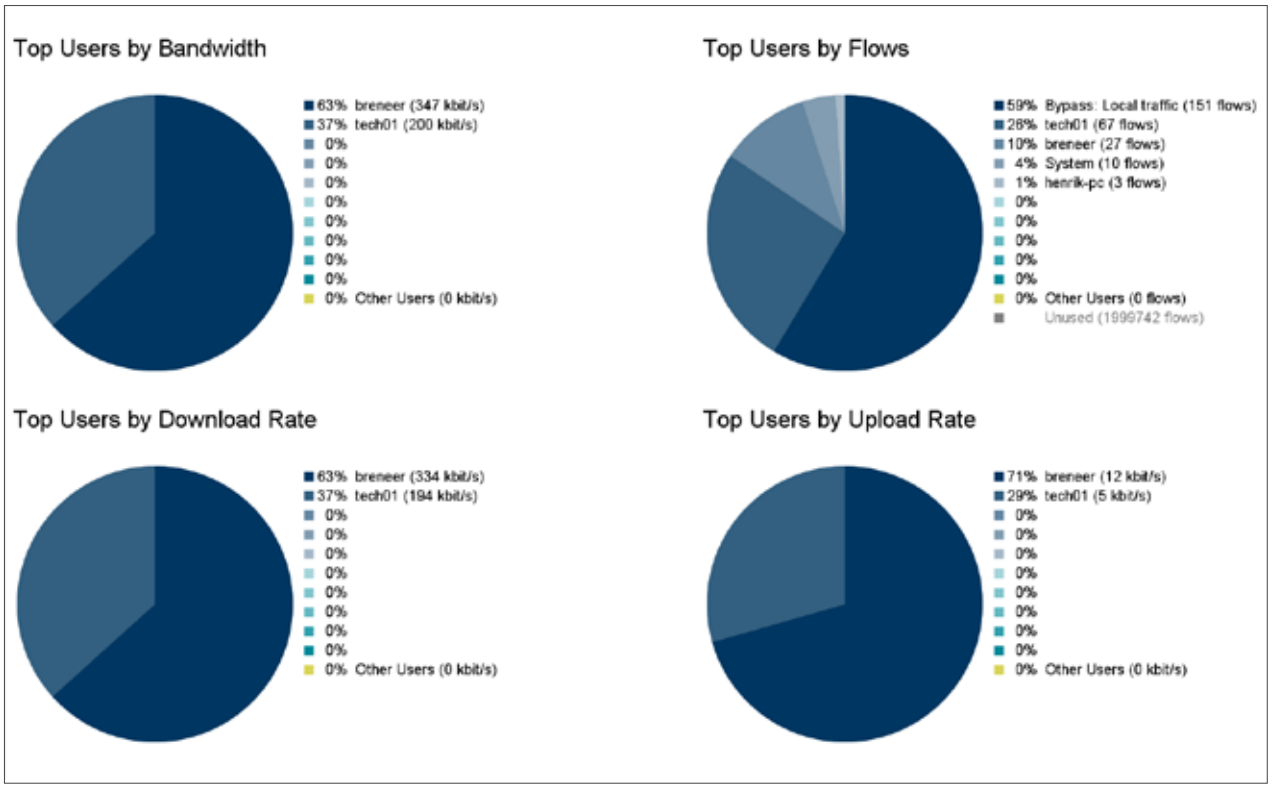
- iDirect X5 modem / router
- SmartShare StraightShaper 4000 Satellite
- Cisco / Linksys SRW224G4P Switch
- Computers (connected by Ethernet cable)
- WIFI access point
- Smartphones (connected wirelessly)
- Stop watch
- Location and date: AGC Marine, 8-DEC-2016

Test scenario: File download vs. speed test

First test scenario is a simple test of website response time without, and with, a SmartShare StraightShaper Satellite.

We are using two computers:

- “breneer” computer, downloading 10 files
- “tech01” computer, performing a speed test (speedtest.net provided by Orkla)



File download vs. speedtest. Test without SmartShare: This screen shot from the SmartShare GUI, was taken while "tech01" was in the download phase of the speed test. The "Top Users by Download Rate" pie shows that, without SmartShare, "breneer" (the PC downloading 10 files) is taking 63 % of the total bandwidth, and that "tech01" only gets 37%.

Test output for comparison: Time to complete the speed test.

The same test was repeated multiple times, both without and with SmartShare.

Test WITHOUT SmartShare StraightShaper 4000 Satellite
The speedtest.net web site showed 0.12~0.13 Mbit/s Download rate.

Time to complete speed test:
Test # 1: 5 min. 52 sec.
Test # 2: 5 min. 50 sec.

Test WITH SmartShareStraightShaper 4000 Satellite
Connection configuration of the SmartShare StraightShaper Satellite is as follows:

Connection Speed	
Download Rate (kbit/s)*:	600
Min. Download Rate (kbit/s)*:	100
Upload Rate (kbit/s)*:	256
Min. Upload Rate (kbit/s)*:	25
Connection Type:	IP

The speedtest.net web site showed 0.20 Mbit/s Download rate.

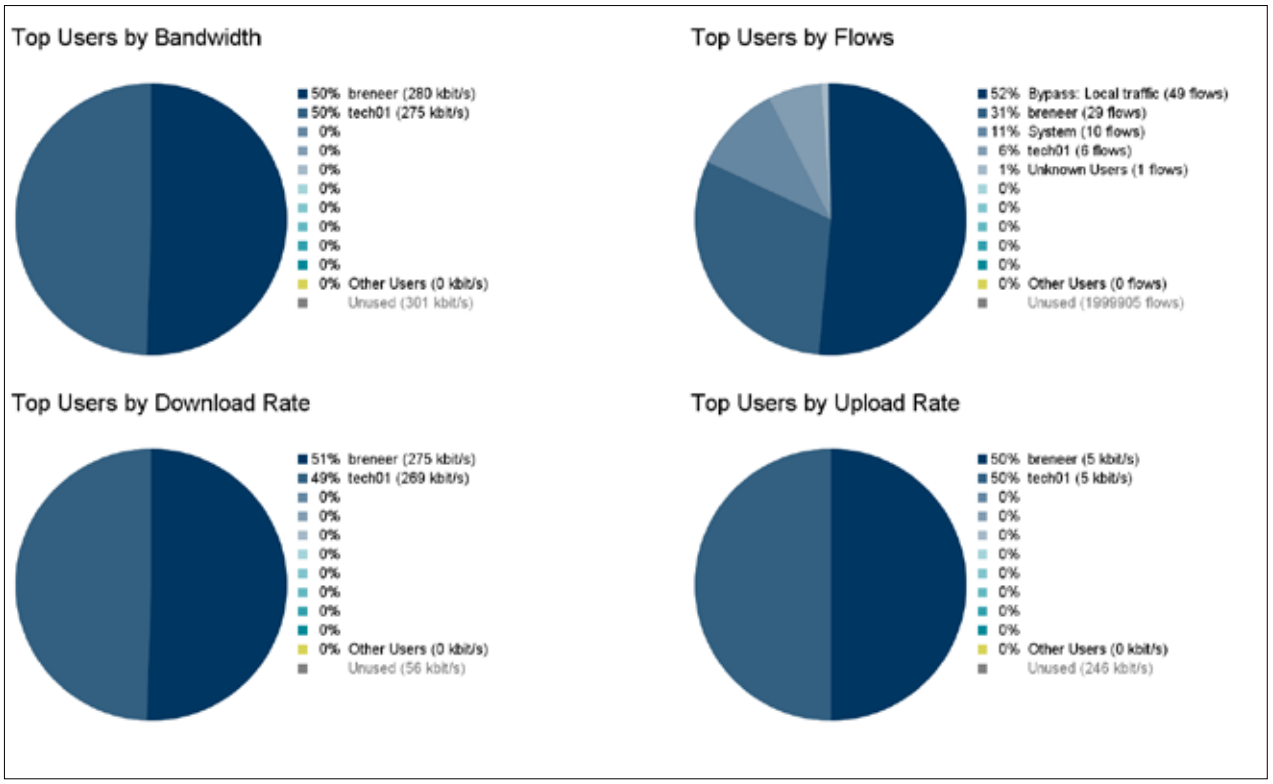
Time to complete speed test:
Test # 1: 4 min. 10 sec.
Test # 2: 4 min. 06 sec.
Test # 3: 4 min. 12 sec.

Conclusion
The speed test completes

- in approx. 4 minutes, with a SmartShare StraightShaper Satellite
- in approx. 6 minutes without a SmartShare StraightShaper Satellite

This is a significant user experience improvement.

Note! The total time it takes for "breneer" to download the 10 files is not affected.



File download vs. speedtest. Test with SmartShare: This screen shot from the SmartShare GUI was again taken, while "tech01" was in the download phase of the speed test. The "Top Users by Download Rate" pie shows that, with SmartShare, both users get 50 % of the total bandwidth, regardless of "breneer" downloading 10 files.

Feature test: Effect of the Weight per User feature

The Weight per User feature allows you to configure individual IP addresses, IP ranges or IP subnets to be granted relatively more bandwidth if necessary. E.g. the captain's PC must be able to access the weather report or other important information quickly.

In this test scenario, the IP address of the captain's PC (represented by the "tech01" computer) is given a weight of 4, meaning that the SmartShare gives the captain 4 shares of the bandwidth, while it gives other users 1 share of bandwidth each.

The test is executed like before: "breneer" downloads 10 files, and "tech01" runs a speed test.

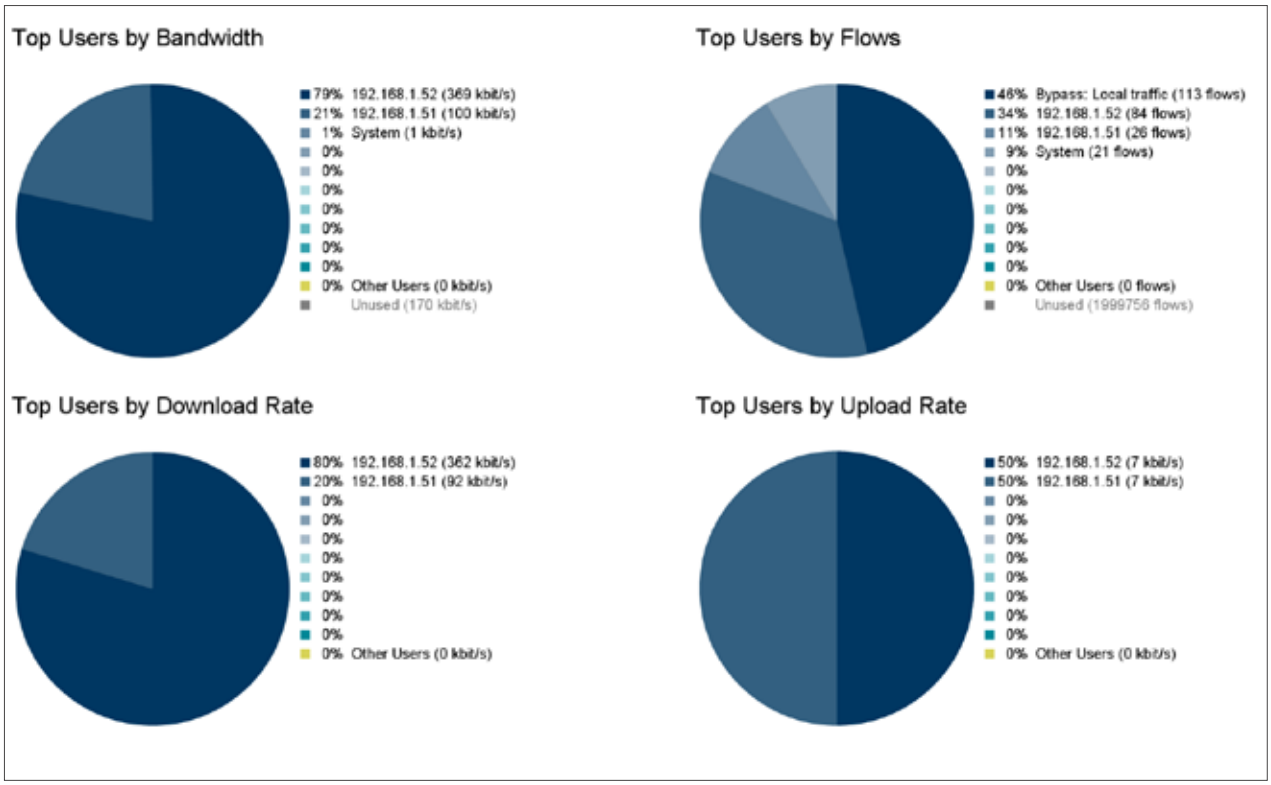
The speedtest.net web site showed 0.32 Mbit/s Download rate.

The time to complete the speed test was not measured; but the higher download rate clearly indicates that it was faster.

Conclusion

With a SmartShare StraightShaper Satellite, user-based weights can be configured to provide more bandwidth, to more important users ,at the cost of providing less bandwidth, to less important users.

See screen shot on next page.



Effect of the weight per user feature: This screen shot from the SmartShare GUI was again taken while "tech01" was in the download phase of the speed test. The "Top Users by Download Rate" pie shows that – with the weight of 4 – the captain's PC (192.168.1.52) gets 80 % of the total bandwidth (4 of 5 shares), and the other PC gets 20 % (1 of 5 shares).

Test scenario: BitTorrent download vs. Speed test

In this test scenario we have:

- "henrik-pc" computer downloading Linux image using BitTorrent
- "tech01" computer performing speed test

Now, the connection download bandwidth is 400 kbit/s.

Test WITHOUT SmartShare
Again, the download bandwidth distribution shown in the SmartShare GUI pie chart, was noted during the Download phase of the speed test.

We have:

"henrik-pc" computer using BitTorent:
388 kbit/s

"tech01" computer performing speed test:
0.02 kbit/s

Time to complete speed test:
Timed out, unable to complete.

Test WITH SmartShare
Again, the download bandwidth distribution shown in the SmartShare GUI pie chart, was noted during the Download phase of the speed test.

We have:
"henrik-pc" computer using BitTorent:
197 kbit/s

"tech01" computer performing speed test:
199 kbit/s

Time to complete speed test:
4 min. 14 sec.

Conclusion
Ordinarily, one heavy user can take nearly all the available bandwidth, rendering the connection practically useless for all the other users. With a SmartShare StraightShaper Satellite, all the users are ensured access to the bandwidth, regardless of what the heavy users are doing. This is a significant improvement.

Note! The speed test completed in approx. 4 minutes like it did in the 10 file download test with the SmartShare. This shows that the SmartShare has the same effect, regardlessly of a user downloading 10 files concurrently or using BitTorrent to download a very large number of files concurrently.

Test scenario: BitTorrent download vs. FaceTime

In this test scenario we have:

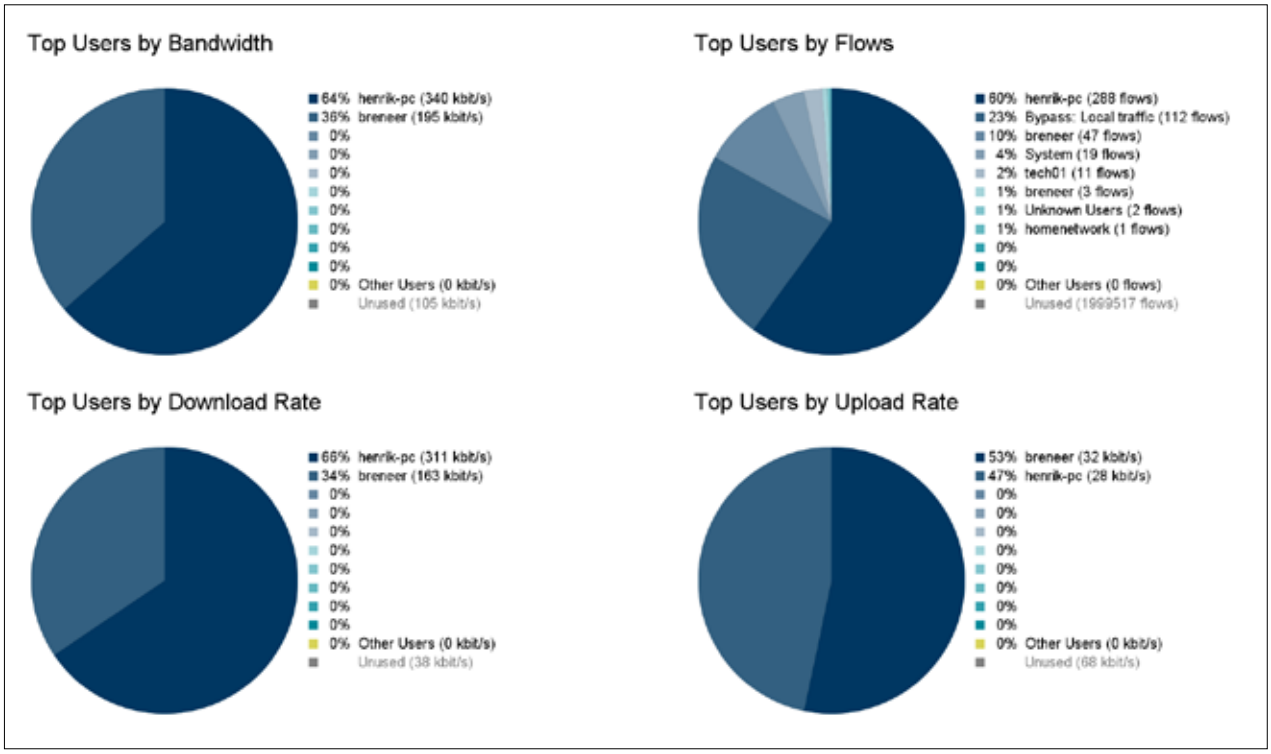
- "henrik-pc" computer downloading Linux image using BitTorrent
- Breneer's smartphone, also named "breneer", using FaceTime (via WIFI)
- Clive's smartphone on 4G/LTE (i.e. not on the VSAT connection) using FaceTime

Test WITH SmartShare
With SmartShare there was enough bandwidth to run a FaceTime session with good video and audio quality (smooth video and no sound fallouts).

Test WITHOUT SmartShare
Without SmartShare the bandwidth for the FaceTime session was under pressure from the BitTorrent session, resulting in poor and sometimes missing video and fallouts in voice.

Experience the FaceTime session at www.smartsharesystems.com

Conclusion
When one user is running FaceTime, and another user also is active, the FaceTime user experience is improved by the SmartShare.



BitTorrent download vs. FaceTime. Test with SmartShare: The "Top Users by Download Rate" pie in this SmartShare GUI screen shot, shows that the "henrik-pc" running BitTorrent got more than 50 % of the total bandwidth, and the "breneer" smartphone running FaceTime only used 163 kbit/s. This is simply because FaceTime did not require 50 % of the total bandwidth, so the SmartShare gave the excess bandwidth to the "henrik-pc" running BitTorrent.

Test summary and conclusion

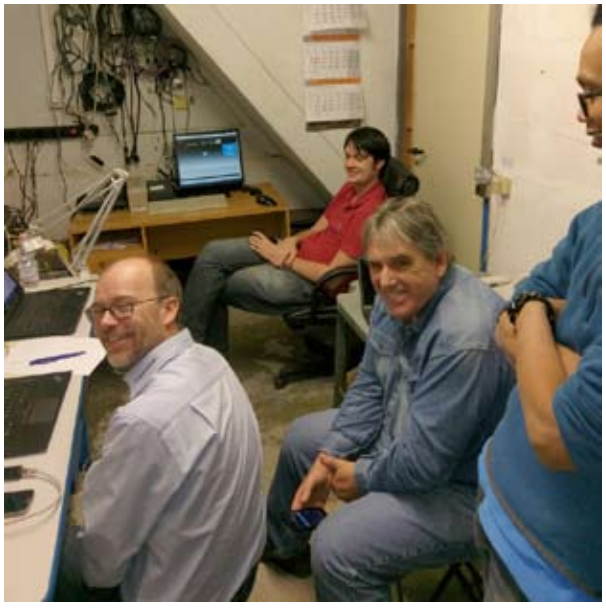
For simplicity, the test scenarios were examples based on only two users. It showed how one user doing something, would normally degrade the other user's user experience significantly, and how the SmartShare improved the situation.

In real-world deployments, more than two users will be affected, and in many other situations than these few tested scenarios, SmartShare will optimize use of bandwidth as well as user experiences.

The tests have shown:

- **that SmartShare StraightShaper Satellite improves the user experience on a low bandwidth, high latency VSAT connection.**
- **that in all the test scenarios, the SmartShare StraightShaper Satellite improved the user experience by ensuring that all users had access to the bandwidth.**

The test team
AGC Marine: Clive Widdowson, Breneer Jacinto, Robin Childs, Daniel Maguire
SmartShare Systems: Morten Brørup, Henrik Güsmer-Riggelsen



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