

SAT>IP

Physical layer agnostic satellite distribution to any IP device

White Paper

Introduction

SAT>IP is a new IP-based architecture for receiving and distributing satellite signals.

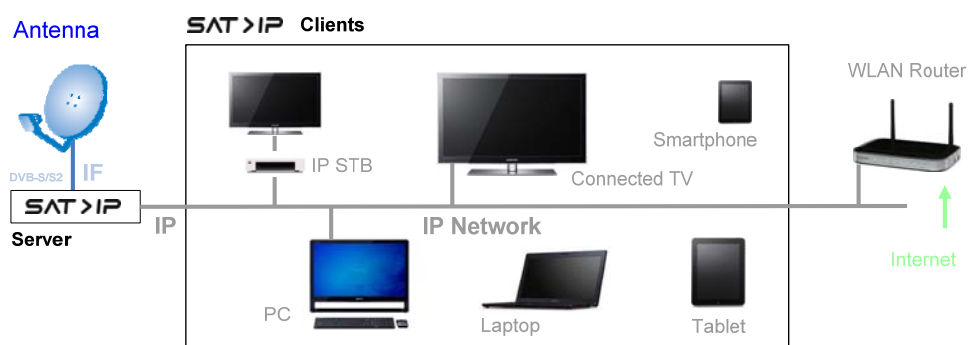
In traditional satellite reception systems, RF (Radio Frequency) satellite signals are only translated in frequency before being distributed via dedicated coaxial cables. Satellite receivers are necessary to receive and demodulate satellite signals.

With SAT>IP, satellite-delivered DVB-S/S2 RF signals are demodulated and converted towards IP right at the point of reception in a SAT>IP server. Such a conversion may happen already in the satellite antenna itself (IP-LNB), close to the antenna (SAT>IP multiswitch or converter) or in a master STB. Effectively SAT>IP servers remove the DVB-S/S2 layer and replace it with an IP transport layer.

Advantages

Once converted to IP, satellite programs can be distributed, like traditional IPTV, over any IP network using wireless (WLAN, 4G), powerline, wired ethernet, optical fibre, plastic fibre, coax, twisted pair (xDSL) or visible light technologies. SAT>IP makes satellite distribution physical layer agnostic.

In a SAT>IP environment, any IP device automatically gets enabled for satellite reception provided the right software is available. Tablets, PCs, Laptops, Smartphones, Connected TVs, Game Consoles, MediaPlayers, IP STBs, etc. can all become satellite viewing clients.

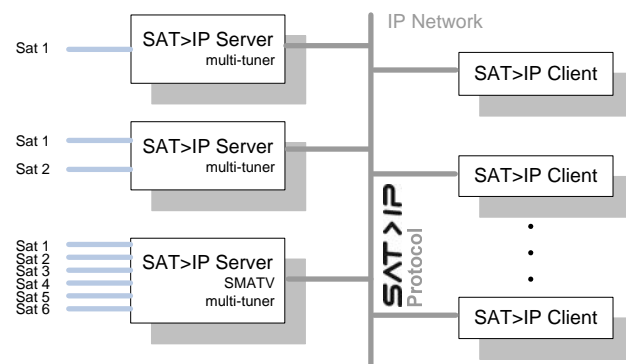


In order to realise this step change in satellite reception, a new manufacturer independent protocol was designed which allows various SAT>IP client devices to communicate with SAT>IP servers.

The SAT>IP protocol was developed in a joint effort between the companies SES, BSkyB and Craftwork.

Technology

In SAT>IP environments, RF tuners and demodulators are removed from end-clients and become a common resource of the IP network where they act as servers for live satellite programs.



SAT>IP clients talk to SAT>IP servers using the SAT>IP protocol.

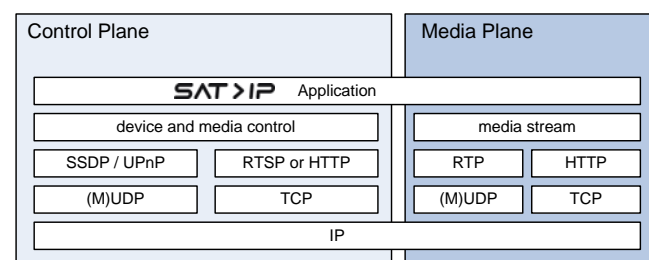
Many SAT>IP servers and clients can coexist on the same network.

Protocol

SAT>IP is a remote tuner protocol based as far as possible on existing internet protocols: IP, UPnP, RTSP, HTTP. These protocols have been complemented with satellite specific extensions only where necessary.

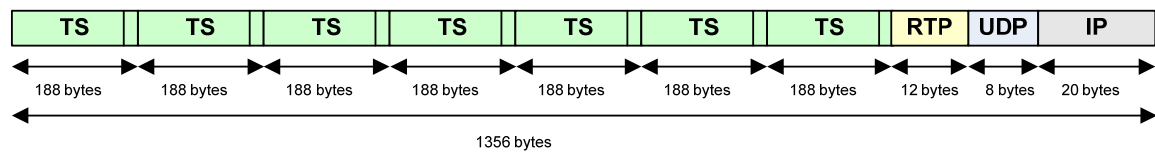
SAT>IP was designed in such a way as to be easily integrated into DLNA compliant environments and devices.

The SAT>IP protocol is logically split in a Media Plane and a Control Plane.



SAT>IP Media Plane

SAT>IP servers can provide satellite media streams in industry standard **unicast** or **multicast RTP/UDP** (RFC 2250).



SAT>IP servers also support **HTTP** stream delivery. Clients request the format that they would like to get.

SAT>IP Control Plane

SAT>IP servers identify themselves on the IP network using standard UPnP mechanisms (SSDP).

Stream Control in SAT>IP is done via RTSP or HTTP. SAT>IP clients request access to satellites, transponders and MPEG PID streams as needed.

RTSP queries are used for requesting RTP unicast or multicast streams. HTTP queries are used for requesting HTTP streams.

Two example SAT>IP queries:

```
rtsp://192.168.128.5/?src=1&fe=1&freq=12720&pol=v&msys=dvbs2
&mtype=8psk&ro=0.35&plts=on&sr=30000&fec=910&pids=0,16,50,104,166,1707

http://192.168.128.5/?src=1&fe=1&freq=12720&pol=v&msys=dvbs2
&mtype=8psk&ro=0.35&plts=on&sr=30000&fec=910&pids=0,16,50,104,166,1707
```

The PID filter functionality of SAT>IP makes sure that only those packets being actually needed are carried over the IP network.

SAT>IP servers also provide real-time reception information to clients about signal statistics via RTCP.

Application Scenarios

The intention with SAT>IP is to enable all of today's receivers and all of today's programs and features associated with satellite reception to be ported one-to-one into an IP environment.

SAT>IP is designed to be usable in both FTA (Free-To-Air) and CA (Conditional Access) environments for both horizontal and vertical operator deployments.

SAT>IP can work in single-home environments as well as in larger multi-dwelling unit (MDU) scenarios.

Many network clients and existing Set-Top-Boxes today can be upgraded to SAT>IP reception simply through a software upgrade.

Conclusion

SAT>IP forwards live satellite programs over IP networks, in their highest quality, untouched, transparently and without transcoding, to any modern multimedia IP device. Both from the technical quality point of view and from the content aspect, this is a unique selling proposition that no other network technology can provide today.

The intention of the SAT>IP project partners is to make SAT>IP an international standard that can be widely implemented in the satellite ecosystem worldwide and that is compatible across manufacturers and operators.

First devices implementing the SAT>IP protocol are becoming available this year.

Contact

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