Sky Italia

Innovative pay-TV operator creates fully virtualized audio/video routing ecosystem

Customer Profile

Sky Italia is the largest pay-TV operator in Italy and one of the largest in Europe, serving 4.73 million subscribers. The company distributes more than 150 channels, mainly via satellite, and its Sky Go brand of content is distributed to mobiles and tablets using OTT delivery. Sky Italia is owned by Sky, Europe's leading entertainment company, serving more than 21 million customers across five countries: Italy, Germany, Austria, the UK and Ireland.

Business Challenge

When Sky (formerly BSkyB) acquired Sky Italia in 2014 and Sky Deutschland in 2015, the multinational, UK-headquartered PayTV giant decided to consolidate the new markets' operations in Milan, tasking Sky Italia with handling all signal contribution for Sky Deutschland.

Sky Italia supports more than 150 of its own channels from operations centers in Milan and Rome, where individual feeds and multiplexed streams are transported within and between the two locations. Faced with the additional burden of handling signal contribution between Milan and Munich, Sky Italia needed to migrate to a large-scale routing system.

As the new routing system needed to be distributed across several locations (floors) within the Milan facility, Sky Italia decided to design the system around an IP switching core using commercial off-the-shelf (COTS) IP switches. However, they also wanted the new implementation to connect to the legacy SDI systems within the Milan facility.

The immediate goal was to leverage the speed and scalability benefits of IP, while achieving the same level of switching quality as they had experienced using a baseband router. In addition, Sky Italia planned to implement an IP-based disaster recovery system at their Rome location. In the longer term, as more production and broadcast equipment becomes IP-centric, Sky Italia's plan is for all the video distribution components within their Milan facility to be IP-based, creating a fully virtualized audio/video routing ecosystem. They were ready to begin a managed transition to an all-IP infrastructure that minimizes disruption and preserves their existing workflows.

Customer

- Sky Italia

Business Challenge

- Implement a large-scale routing system in a hybrid SDI/IP environment
- Make a managed transition to all-IP infrastructure that minimizes disruption and preserves workflow processes

Technology Solutions

- Hybrid SDI/IP routing infrastructure
- Uncompressed-over-IP gateways
- Overarching software control system for IP/SDI hybrid networks

Business Value

- Enables efficient, centralized monitoring of multiple sites
- Makes IP network look like SDI— easy to operate
- Protects existing investments while making phased transition to all-IP future

Technology Solution

Key to Sky Italia's choice of a new system was their preference for a unified, open and standards-based approach.
They were also looking to deploy a highly reliable and scalable solution to support their current business, as well as
continued expansion. And because they were heading down a new technology path, they wanted to partner with a
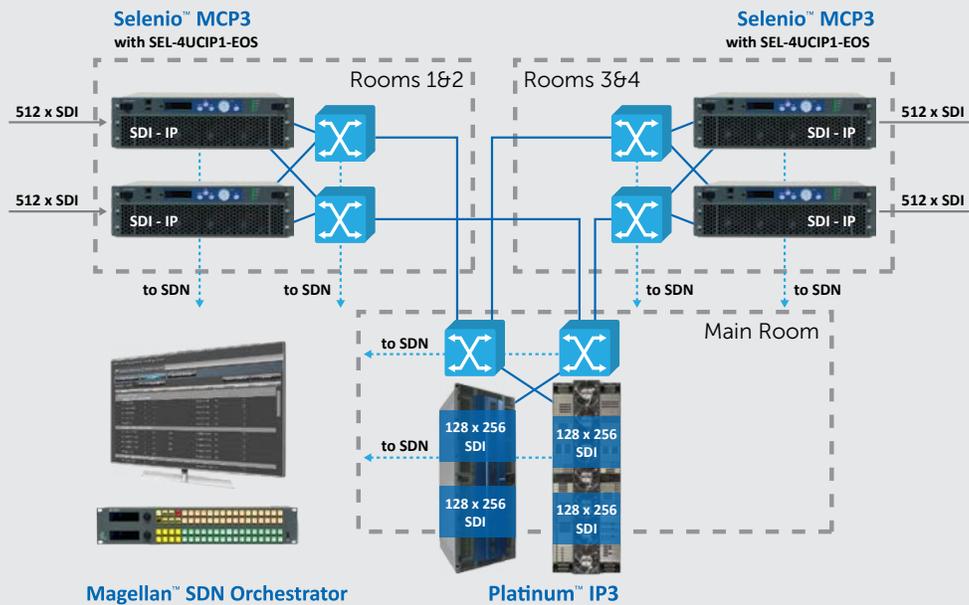vendor that shared their vision.

Sky Italia ultimately chose a state-of-the-art solution featuring Imagine Communications' Platinum™ IP3 routers
and high-performance Arista network switches, with the entire workflow managed by Imagine's Magellan™ SDN
Orchestrator. Deployed in fully redundant 1+1 configurations, the IP3 routers are used to switch the SDI signals, while
the Arista IP switches, also in 1+1 redundant configurations, switch the IP-encapsulated SDI streams.

The IP3 routers feature integrated Platinum Uncompressed-over-IP (UCIP) modules, which encapsulate and
de-encapsulate signals and move them between the SDI domain and the IP domain. In total, the first phase of Sky
Italia's new system can handle 640x640 IP streams in a main and backup network, connecting to a 128x128 SDI
matrix in a non-blocking way.

Also key to Sky Italia's implementation is Imagine's Selenio™ MCP
processing, compression and IP networking platform, featuring
500 multichannel UCIP gateway cards. Both the Platinum and
Selenio UCIP cards are modular "on-ramp/off-ramp" solutions that
encapsulate SDI baseband signals into IP streams and vice versa. Sky
Italia can use the UCIP modules to manage the synchronization of IP
signals where they re-enter the HD-SDI world, eliminating network
jitter and aligning perfectly to legacy sync signals. The modules are
also able to synchronize its output time-base via PTP (SMPTE 2059),
and can do full AES67 audio breakaway and re-combination of the
audio signals from/to the SDI signals.

The Magellan SDN Orchestrator controls the Platinum IP3 routers,
i.e., the SDI signal flows within the Sky Italia infrastructure. Sky
Italia can also use the Magellan SDN Orchestrator to control the
stream-flows and mappings inside their IP network — providing the
bandwidth management and Quality of Service (QoS) required to
achieve professional broadcast performance. SDI and IP sources and
destinations are kept in a single Magellan SDN Orchestrator database,
and the gateways between the SDI infrastructure and the IP virtual matrix
— as well as the allocation of bandwidth between the IP switches — are
managed using tie-line control methods.

Selenio™ MCP3 with SEL-4UCIP1-EOS

Selenio™ MCP3 with SEL-4UCIP1-EOS

Rooms 1&2

Rooms 3&4

512 x SDI → SDI - IP

512 x SDI → SDI - IP

SDI - IP → 512 x SDI

SDI - IP → 512 x SDI

to SDN   to SDN   to SDN   to SDN

Main Room

to SDN

to SDN

128 x 256 SDI

128 x 256 SDI

128 x 256 SDI

128 x 256 SDI

Magellan™ SDN Orchestrator

Platinum™ IP3

The Sky Italia system is a hybrid SDI and IP matrix distributed across several areas of one building — all controlled by a seamless, unified management layer.

Rooms 1&2: Main/backup Selenio UCIP modules feed into main/backup IP network using ST 2022-7 seamless merge redundancy. Capacity to encapsulate 512 HD-SDI signals into ST 2022-6 streams.

Rooms 3&4: De-encapsulation from ST 2022-6 streams back into HD-SDI via Selenio UCIP modules using the same redundancy architecture and mechanisms.

Main Room: Main/backup Platinum IP3 routers with integrated PX UCIP modules connect to legacy SDI infrastructure and provide capacity to de-encapsulate 128 ST 2022-6 streams into HD-SDI and vice versa.

Business Value

Taking a visionary but realistic approach to their IP transition plans, Sky Italia chose to implement an open-standard, interoperable system that allows them to make a measured investment in IP, while keeping intact the already paid for infrastructure that handles SDI signals.

The company realized that it was not practical to have their operators deal with the baseband network in one way and with the IP network in a completely different way — they needed to have the same operational interfaces and processes in both networks. With advanced techniques that transparently map IP signals into the existing workflow, the Magellan SDN Orchestrator provides a seamless, unifying management layer for both the Platinum routers and the IP switches. This allows Sky Italia operators to use familiar hardware and software control panels to accommodate both signal types in the hybrid workflow environment.

As the interplay between the SDI infrastructure and IP-based connectivity is managed using tie-line control methods, the upstream functions in Sky Italia's plant — automation, tally systems, multiviewers, and master control switchers — can continue to use existing industry-common routing control protocols, even when the source, destination, or both are actually in the IP domain. The result is a network based on COTS IP switches that provides the same real-time quality performance that baseband systems deliver today.

Because Imagine offers two versions of its UCIP modules — one for the high-density Selenio media convergence platform and one to be installed directly in the Platinum IP3 frame — Sky Italia was able to design an exceptionally compact solution that is capable of handling a large number of streams and can be distributed across multiple rooms using IP connectivity.

Overall, this hybrid system has enabled Sky Italia to leverage the advantages of IP technology without disrupting their established operational procedures and without sacrificing any of the performance parameters required in a broadcast operation, as well as buy time for their operational staff to adjust to new, all IP-based workflows.