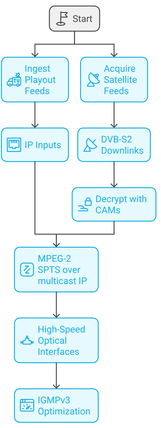
Technical Approach for Es'hailSat Distribution

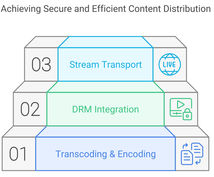
1. Content Sources & Signal Ingestion
For Es'hailSat, the process starts by integrating both **Es'hailSat playout feeds** and **direct satellite feeds** into our distribution system:

- **Playout Feeds**: Pre-packaged streams managed by Es'hailSat are ingested via IP inputs.
- **Satellite Feeds**: Raw signals are acquired using DVB-S2 downlinks, decrypted where necessary using **Conditional Access Modules (CAMs)**.
- **Ingestion Method**: Channels are ingested as **MPEG-2 SPTS over multicast IP** using high-speed optical interfaces (1000BASE-LX and 10GBASE-LR). This ensures bandwidth efficiency and scalability.
- **Multicast Optimization**: Utilizes **IGMPv3 (Source-Specific Multicast)** to control data flow and minimize unnecessary bandwidth usage.



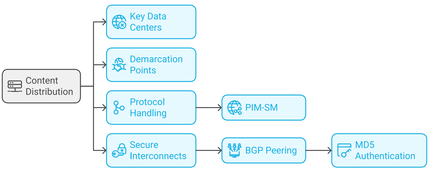
2. Content Processing Pipeline
Once ingested, the content is processed to prepare it for multi-platform distribution:

- **Transcoding & Encoding**: Streams are converted into adaptive bitrate profiles using H.264 and H.265 (HEVC) codecs, optimizing for both OTT and traditional broadcast networks.
- **DRM Integration**: We apply **AES-128, AES-192, AES-256** or others according to agreements to secure content across devices.
- **Stream Transport**: Encapsulate streams in **MPEG-2 transport over IP** for efficient routing and delivery.



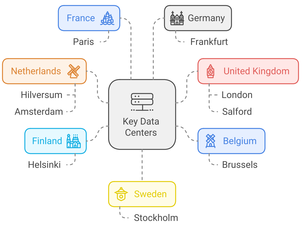
3. Multicast Distribution & Data Center Connectivity
The processed content is then routed through our network of data centers to reach operators:

- **Demarcation Points**: Content exits our system through designated points, ensuring a clean handoff to partners or operators.
- **Protocol Handling**: Use **PIM-SM (Protocol Independent Multicast - Sparse Mode)** for optimized multicast routing, ensuring low-latency distribution.
- **Secure Interconnects**: Implement **BGP peering with MD5 authentication** for secure data exchanges between data centers and partners.



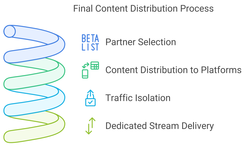
Going through **Data Centers**, serve as distribution hubs, providing robust connectivity to European operators:

- **Belgium** / Brussels
- **Finland** / Helsinki
- **France** / Paris
- **Germany** / Frankfurt
- **Netherlands** / Hilversum
- **Netherlands** / Amsterdam
- **Sweden** / Stockholm
- **United Kingdom** / London
- **United Kingdom** / Salford



4. Partner Network & Final Delivery
Leveraging partners ensures efficient last-mile delivery to various operators:

- **Last-Mile Distribution**: Operators receive content seamlessly through a robust partner network, enabling distribution across OTT, IPTV, satellite, and mobile platforms.
- **Traffic Isolation**: VLAN tagging and Layer 2 segregation ensure that each operator receives a dedicated and secure stream.



Supported by our network of established partners to reach end-users across the globe :

Canal+ Africa
Broadcasting across 22 African countries.

VodafoneZiggo
Reaching users in the Netherlands with robust telecom services.

Itissalat Al Maghrib
Serving Moroccan users with extensive telecom coverage.

Orange
Connecting users in Belgium and France with innovative solutions.

Sling
Offering streaming services to users in the United States.

Deutsche Telekom
Providing comprehensive telecom services in Germany.

More partners
Major telecom operators in America, Africa and Europe

Conclusion

The approach for Es'hailSat involves a streamlined, secure pipeline from content ingestion to delivery, leveraging advanced multicast protocols, robust data center infrastructure, and established partner networks. This ensures efficient, reliable, and scalable content distribution tailored to Es'hailSat's requirements.