**TITAN Mux**

**Multi-Function Software Stream Processing**

TITAN Mux is a scalable stream processing solution for broadcast, cable, satellite over the top and network applications. TITAN mux can be easily incorporated into any existing headend for supporting digital turnaround services. The TITAN Mux scalable design reduces deployment time, enables adding new services on the fly and support any video, audio and data service.

TITAN Mux can be controlled by ATEME management system, and easily integrate with any NMS using REST API. TITAN Mux is a true hardware and OS agnostic solution running on any server, any form factor, bare-metal OS as well Virtual Machines.

TITAN Mux includes support for IP input-output and support for legacy ASI headend using PCIe ASI cards.

TITAN Mux eliminates operational headaches and ensures high scalability and flexibility and availability.

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<th>Key features</th>
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<td>Multiplexing of any MPEG service</td>
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<td>On-the-fly configuration</td>
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<td>Any redundancy scheme support</td>
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<td>Conditional Access support</td>
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<td>Ad-Insertion Support</td>
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<th>Benefits</th>
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<td>Software and Virtual machine scalability</td>
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<td>Future-Proof Software-Based Architecture</td>
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<td>Reduce integration OPEX and challenges</td>
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<td>Enabler of End-to-End IP Video Ecosystem</td>
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**Input/Output Interfaces**

**TS/IP**
- UDP, RTP (IGMPv3 multicast, unicast)
- CBR, VBR
- ST2022-1/2 (any FEC dimensions)
- Up to 256 SPTS/MPTS, 1 GB per physical connector

**TS/DVB-ASI**
- MPEG2-TS, 188 or 204 bytes
- Up to 256 SPTS/MPTS, 210 mbps per physical connector

**Multiplexing/Remultiplexing**
- **PCR de-jittering**
  - Ultra low bandwidth software PLL
  - Admissible peak jitter up to 100ms

- **PID Merging**
  - Merge any PID into any program
  - PCR/DTS/PTS adjustment

- **PID Filtering/Tracking/Remapping**
  - Dynamically follows input to produce a static output
  - Comprehensive set of tracking rules (type, codec, etc.)

- **PSI/SI/PSIP Edition**
  - Extract/Block/Pass/Edit any tables and descriptors
  - Custom edition of any inner/outer loop descriptors

- **Any to Any Conformance**
  - MPEG, DVB, ATSC, ISDB conformance and conversion

- **Rate Limiting**
  - Rate limiting on a PID/service basis for a guaranteed output QoS
  - Advanced overflow prevention

- **Data Injection**
  - Injection of any table/PID
  - Constant or Opportunistic bit rate insertion

- **Scrambling**
  - **BISS**
    - BISS 1/E scrambling (multiple injected IDs)*
    - BISS 1/E descrambling (multiple injected IDs)

- **SimulCrypt**
  - Fully compliant with the ETSI 103197 SimulCrypt specification
  - EMM/ECM/Private Data interface
  - DVB-C/SAI/AES scrambling support
  - Nagra/Conax, Verimatrix, Irdeto, NDS, Viaccess integration*

- **Ad Insertion/Content Replacement**
  - Video codec: MPEG2, H.264, HEVC
  - Audio codec: MPEG1-L2, AAC, AC3/AC3+, DolbyE
  - Data: Teletext, OP47, Dvb-Sub
  - SCTE 30 Interface
  - Frame accurate splicing

**Statistical Multiplexing**
- Any resolution: from sub-SD to UHD
- Any codec: MPEG2, H.264, HEVC
- Remote/Local/Mixed StatMux with the TITAN Live transcoder.
- Dynamic VBR Reservation
- Encoder Aggregation support

**Advanced Monitoring**
- PCR jitter analysis
- ETSI 101290 input analysis and reporting (level 1, 2 and 3)
- Visualization of input/output MPEG stream structure
- Advanced Elementary Stream analysis

**Redundancy**
- Input interface redundancy
- ST2022-7 input/output redundancy (Class SBR, High-Skew link)
- Input TS/Service redundancy
- RIP/OSPF based network redundancy*
- Standalone unit 1:1 redundancy*

**Configuration and Management**
- IPv4, IPv6
- Full VLAN & routes support
- HTML Web Graphic User Interface
- Comprehensive set of alarms
- SNMP (MIB v2c) with remote SNMP supervisor
- Northbound REST API
- N+1 Redundancy management via ATEME Management System

**Virtualization**
- VMware ESXi 5.5 and 6.0
- KVM/QEMU, Containers*

**Software**
- Deliverable as a full ISO image
- Deliverable as a Redhat Packet Manager (.rpm) package*
- Deliverable as a Debian (.deb) package*

**Physical**
- Minimum configuration: 1x Intel E5-24xx, 4GB RAM
- Any number of Ethernet connectors
- ASI support through COTS board
- Guaranteed performance on DELL, HP and Cisco UCS blade server
- Run on any COTS server or blade server

*contact ATEME for availability