



TSDuck



A toolbox for MPEG/DVB transport streams

Thierry Lelégard
IBC 2018, EBU Open Source Meetup



What is TSDuck ?

A general-purpose toolbox for digital television engineers

- for MPEG transport streams (broadcast, IP-TV)
- flexible and extensible

Tools and plugins to be combined

- command line
- made for scripting

Linux, Windows, macOS



TSDuck use cases



Digital television systems

- demo
- network monitoring
- system integration
- test
- debug
- lab activities in general





TSDuck sample usages

- TS acquisition or transmodulation : satellite, terrestrial, IP ...
- analysis : TS, PSI/SI, bitrates, timestamps ...
- monitoring : bitrates, A/V properties, signalization, crypto ...
- on-the-fly transformation or injection : content, PSI/SI ...
- using and editing PSI/SI in XML or binary format
- modify, remove, rename, extract services
- inject or extract MPE, SCTE 35 splicing info
- extract T2-MI, teletext subtitles
- test bed for CAS or STB, scrambling and DVB SimulCrypt



TSDuck input / output

Offline transport stream files

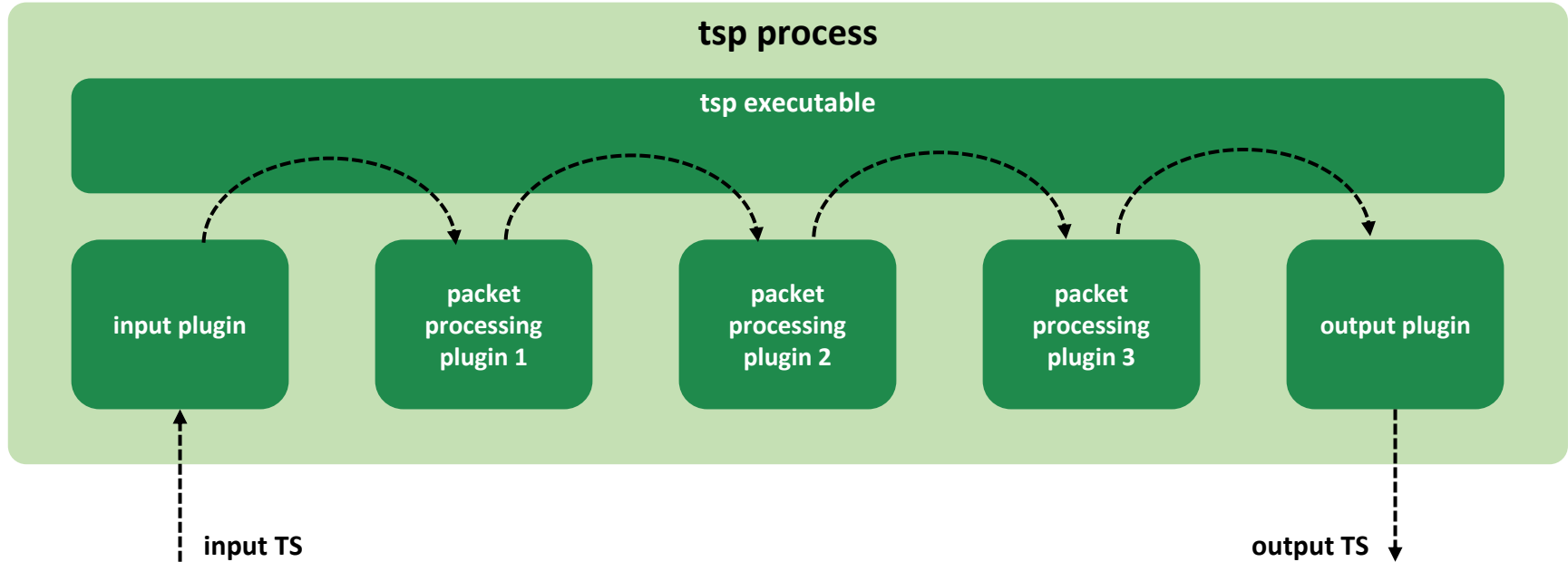
Re-route transport streams to / from other applications

Live transport streams

- UDP/IP, HTTP
- Specialized hardware
 - cheap DVB tuners
 - professional Dektec devices
 - cheap HiDes modulators



TSP – the transport stream processor

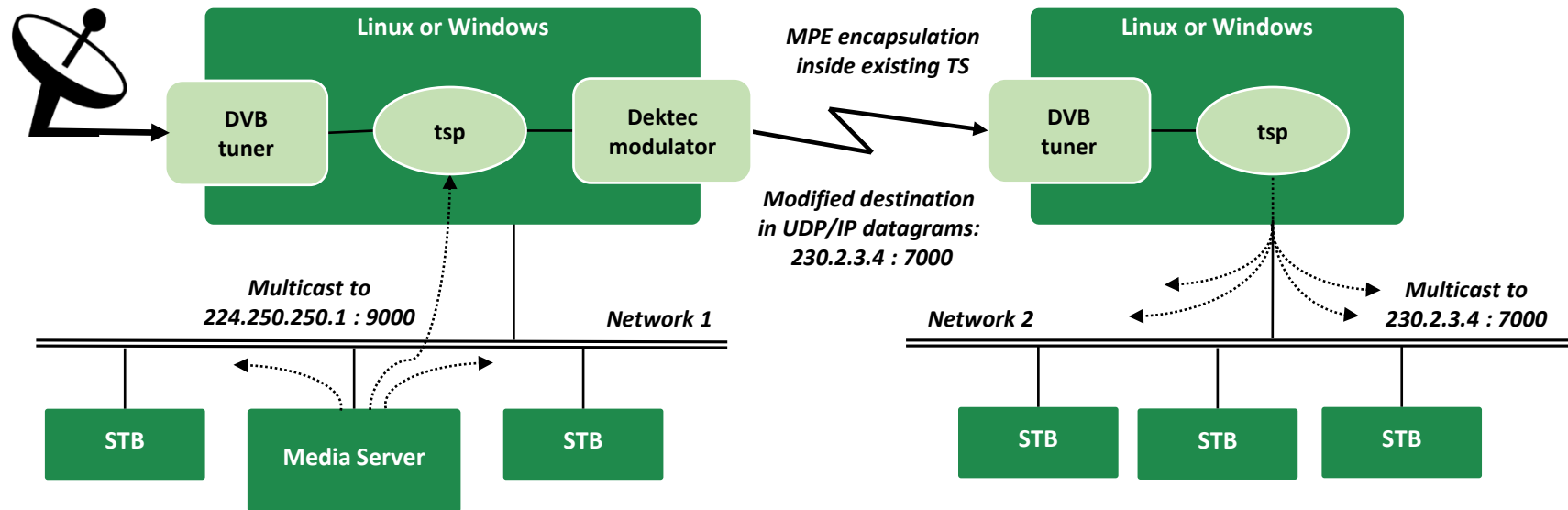


combination of elementary processing using plugins
60+ standard plugins available



Sample MPE injection and extraction

MPE : Multi-Protocol Encapsulation



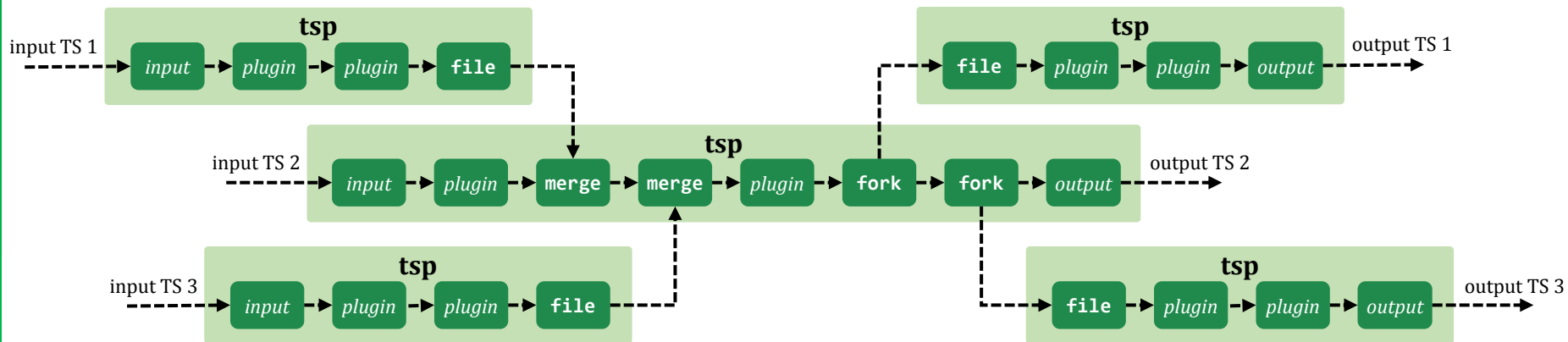


Multiple TSP using merge and fork plugins

Merge with a TS coming from another application

- and merge signalization

Duplicate the TS to another application

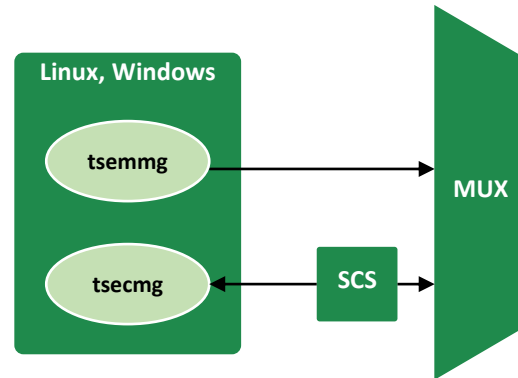
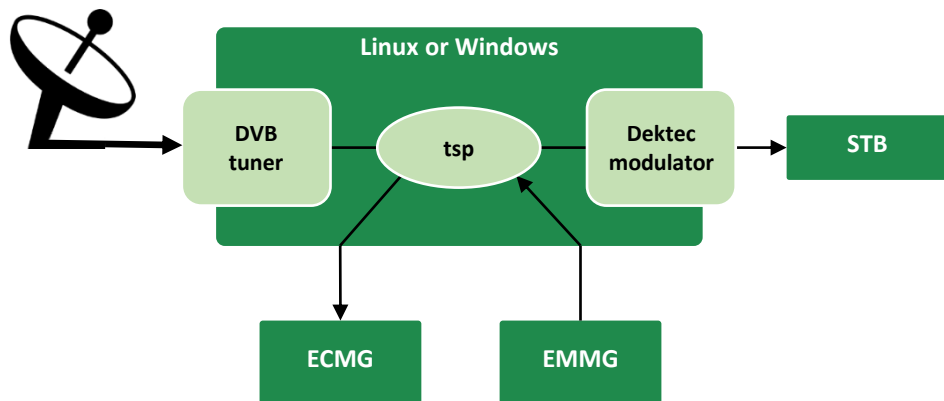




Conditional Access System test bed

DVB SimulCrypt interface

- emulate CAS, test actual MUX
- emulate MUX, test actual CAS





Simple TSP examples

Transmodulation of a service over IP multicast

```
tsp -I dvb --uhf 35  
-P zap france2 --audio fra  
-O ip 224.10.11.12:1000
```

extract service « France 2 »,
keeping only one audio track

broadcast resulting SPTS to
multicast IP address:port

On-the-fly signalization replacement

```
tsp -I dvb --uhf 24  
-P inject nit.xml --pid 16 --replace --stuffing  
-O dektec --uhf 24 --convolution 2/3 --guard 1/32
```

replace content of PID 16 with
table from XML file

send modified TS to a Dektec DVB-T
modulator on same frequency



TSDuck is extensible

Open source

<https://github.com/tsduck/tsduck>

Design based on a large TSDuck library

- generic MPEG/DVB C++ library (400+ classes)
- common API for Linux, Windows, macOS
- programmer's guide online

You may use this library to

- develop new plugins
- use in your own applications outside TSDuck

<https://tsduck.io/>

