



ViBE XT1000 ***XTREAM TRANSCODER***

THOMSON

▶ VIDEO NETWORKS



12-Jan-15



>> www.thomson-networks.com

ViBE XT1000

HIGH DENSITY TRANSCODER

***BROADCAST &
MULTI-SCREEN***

***LIVE
TURNAROUND***

***SCALABLE
DENSITY***

***ANY-TO-ANY
CODEC***



APPLICATIONS

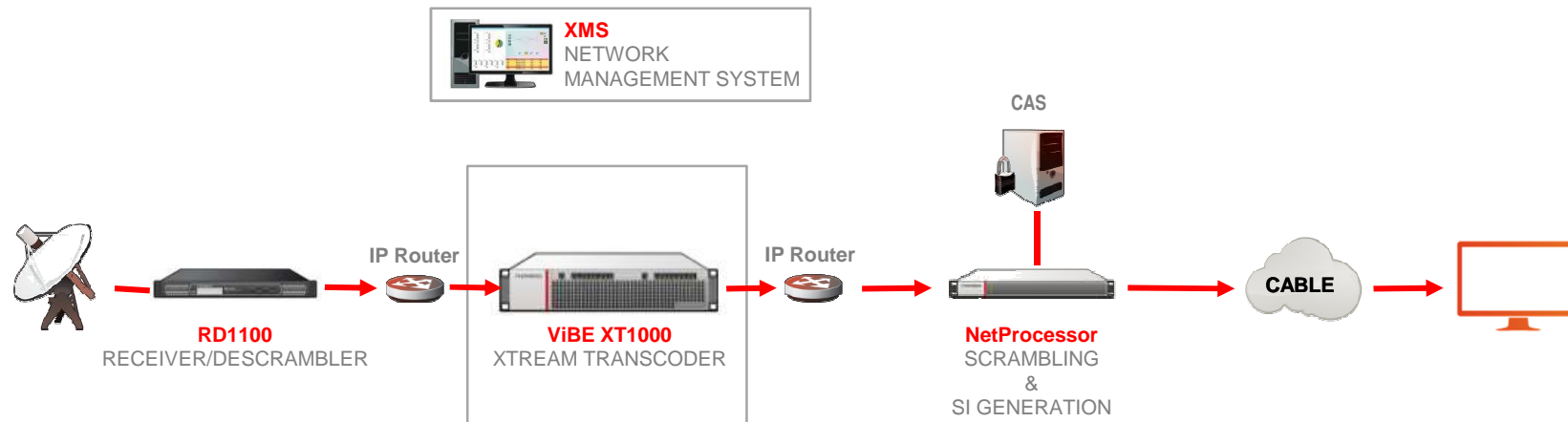
- ▶ *Digital Turnaround for Cable TV, DTTV, DTH and IPTV*
 - ▶ When high volume of channels
 - ▶ When channel lineup growing rapidly
 - ▶ When compact and cost effective solution required

- ▶ *Multi-screen encoding*

- ▶ *Disaster recovery solution*
 - ▶ Cost effective solution

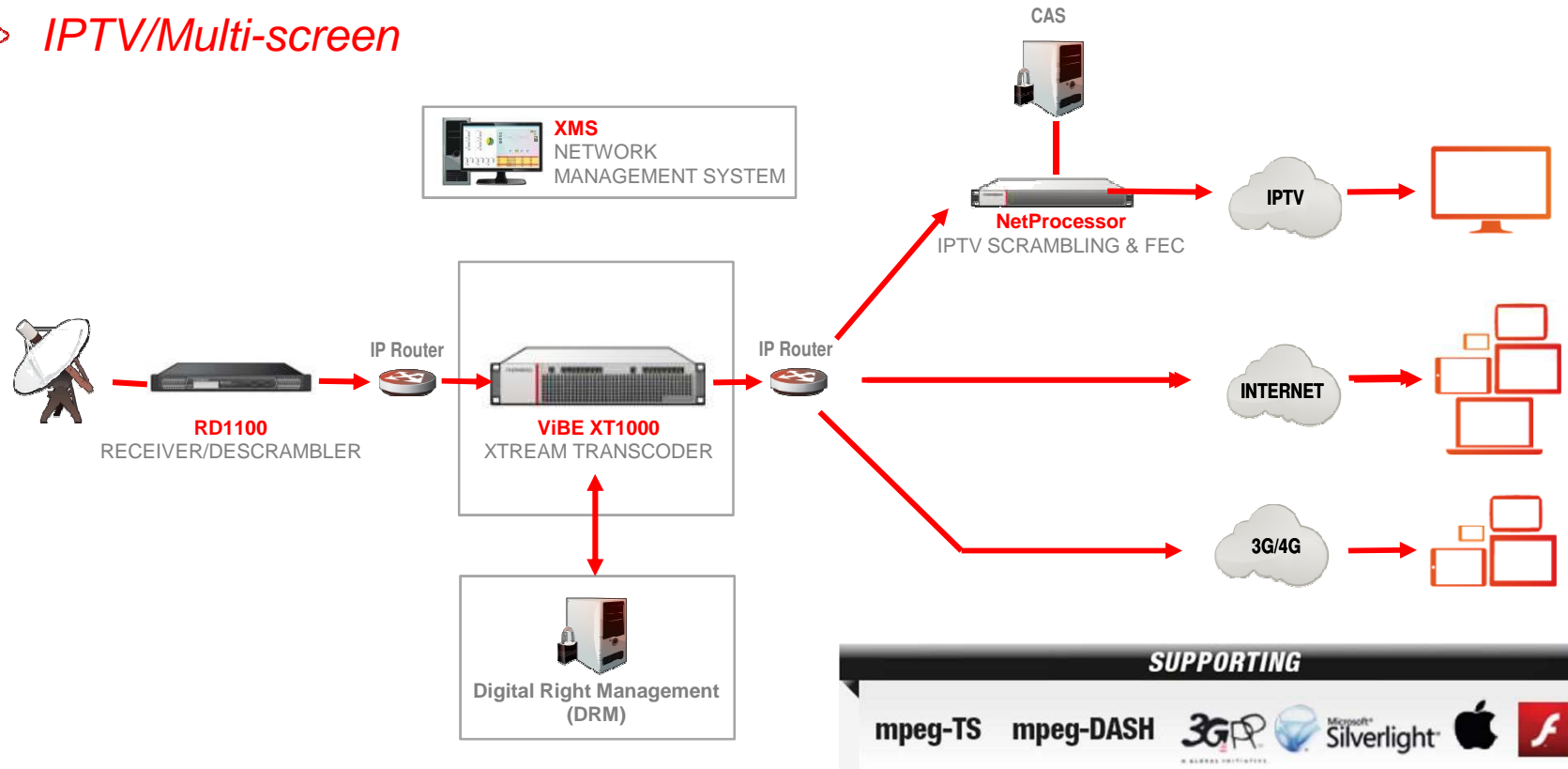
APPLICATION EXAMPLE

▷ Digital turnaround (Cable TV)



APPLICATION EXAMPLE

▶ IPTV/Multi-screen



SUPPORTING

mpeg-TS mpeg-DASH 3GPP Microsoft Silverlight Apple f

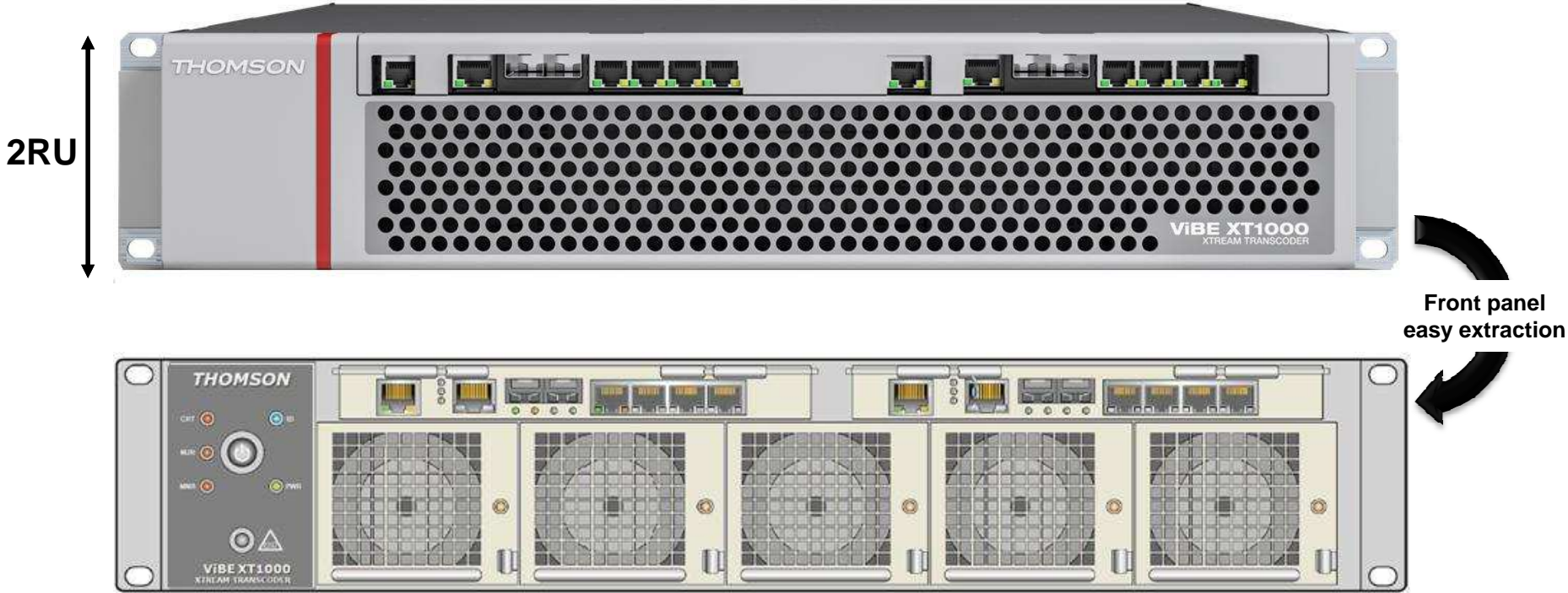
ViBE XT1000 IN FEW WORDS

54 HD / 180 SD

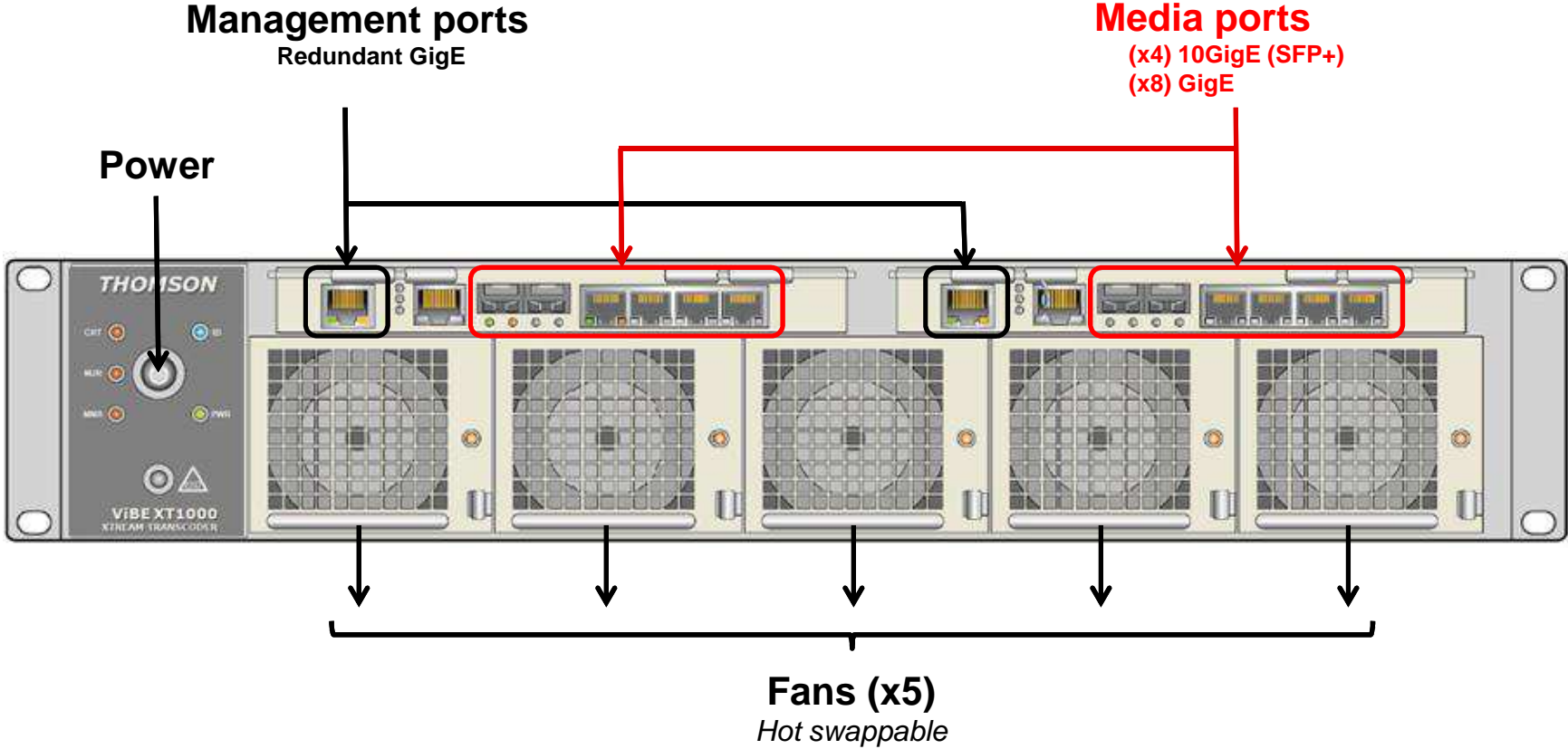
- ▷ *Live IP input/output (SPTS and MPTS)*
- ▷ *Scalable and high density*
- ▷ *Any to Any Video format*
 - ▷ MPEG-2 SD/HD
 - ▷ MPEG-4 SD/HD
- ▷ *Any to Any Audio format*
 - ▷ MPEG-1 Layer II
 - ▷ Dolby Digital, Dolby Digital Plus
 - ▷ AAC
- ▷ *Added value features*
 - ▷ Logo, text insertion
 - ▷ Subtitles management
- ▷ *Internal failover management*
- ▷ *Multi-environment*
 - ▷ **Broadcast:** CBR and VBR (internal statistical multiplexing)
 - ▷ **Multi-screen:** ABR on Transport Stream, RTMP, HLS, HSS and DASH output



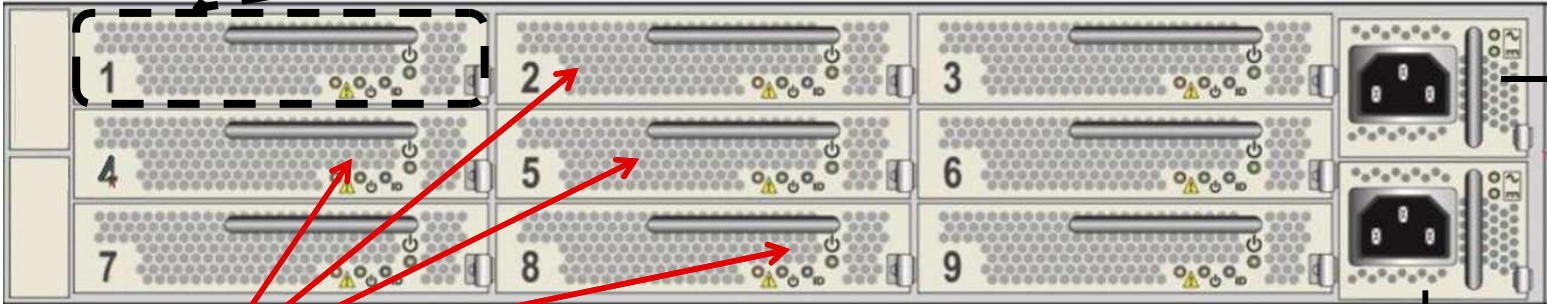
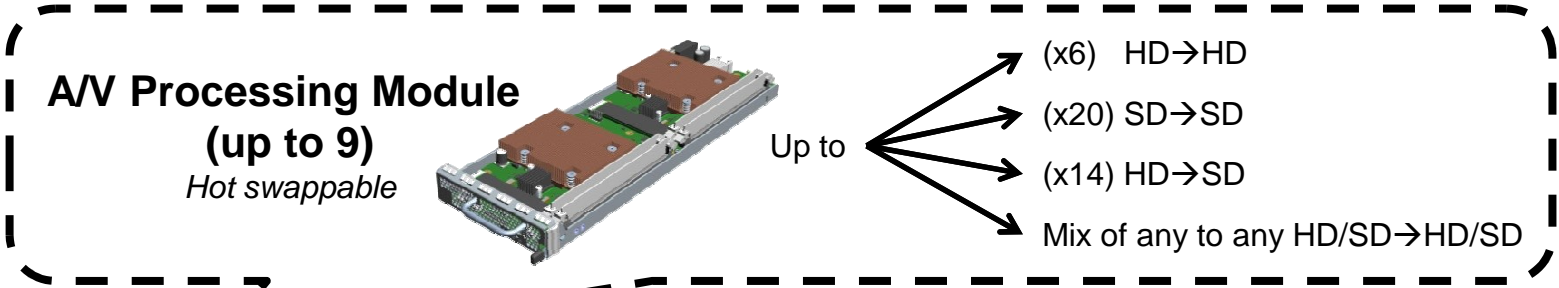
THE PLATFORM – FRONT SIDE



THE PLATFORM – FRONT SIDE



THE PLATFORM – REAR SIDE

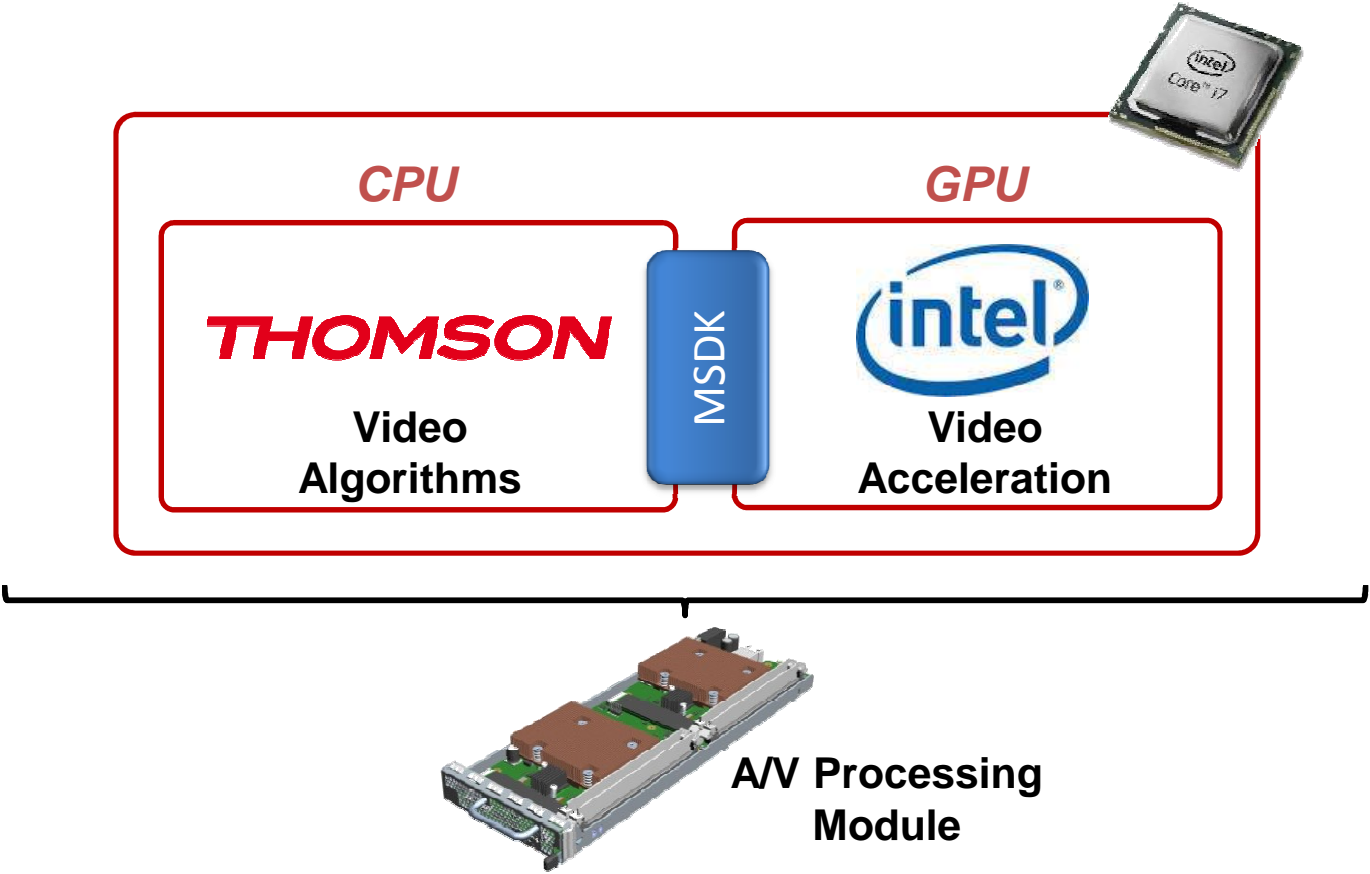


Load Balancing + Internal Failover
Powered by MediaFlex^{OS}

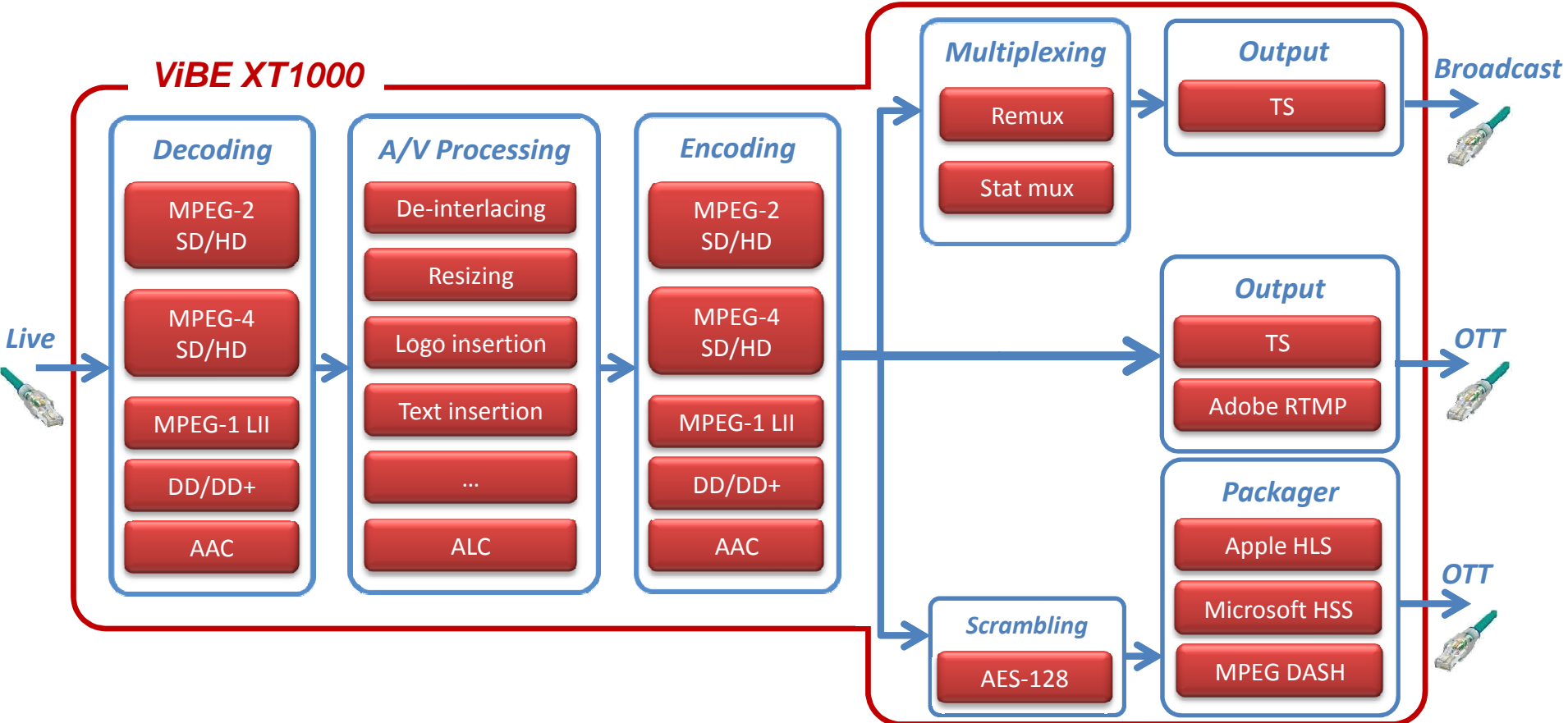
Redundant AC PSU
Hot swappable



BROADCAST GRADE VIDEO QUALITY FOR TURNAROUND



DETAILED FEATURES



DETAILED FEATURES

▷ *Video Processing*

- ▷ De-interlacing
- ▷ Up/Down scaling (64x64 to 1920x1080)
- ▷ Frame rate adjustment (5 to 60 fps)
- ▷ Animated/Static logo insertion
- ▷ Text insertion (static or crawling)

▷ *Data Processing*

- ▷ DVB subtitles, DVB Teletext and CC
- ▷ Subtitling pass through & conversion
 - ▷ WebVTT, SMPTE-TT, DFXP
- ▷ SCTE35 cue tone
 - ▷ Pass through, ESAM compliant

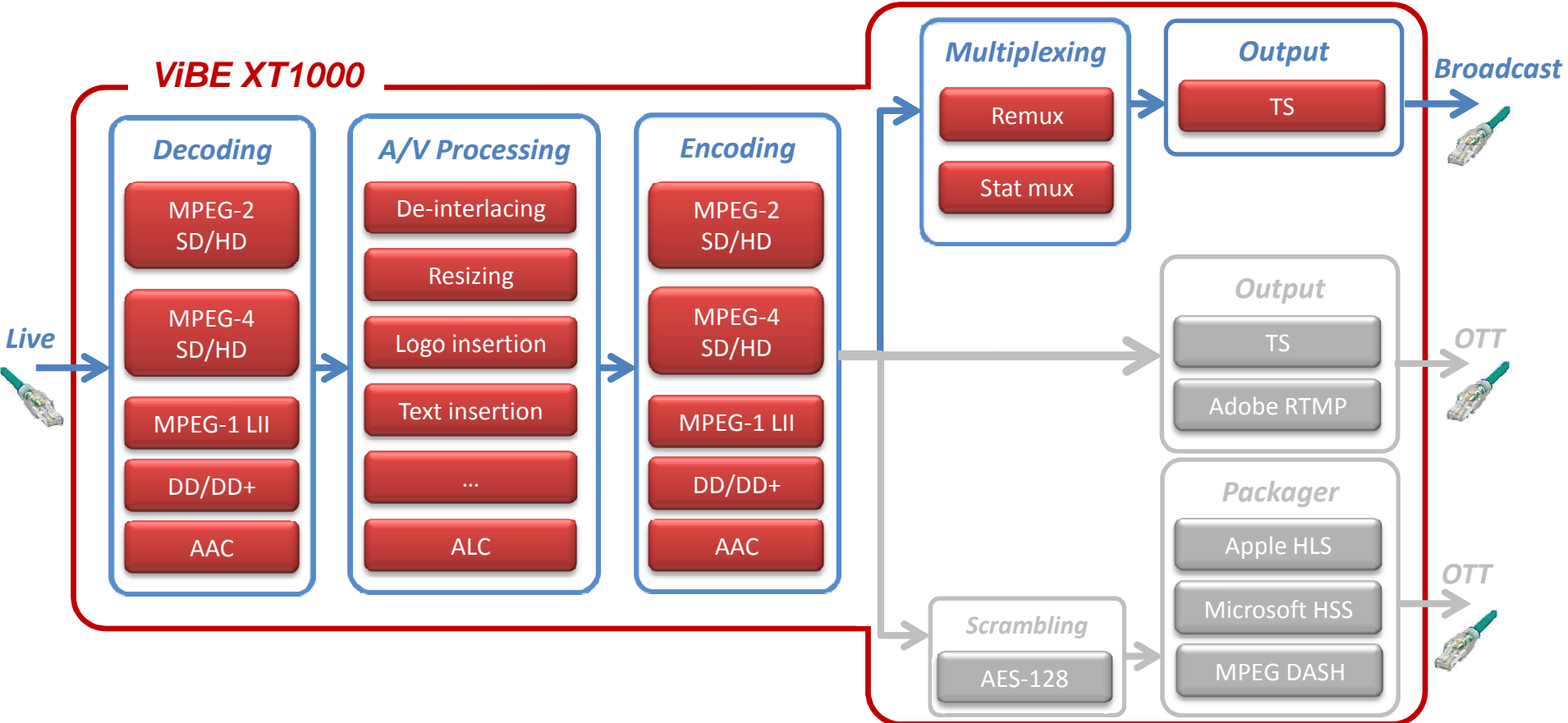
▷ *Audio Processing*

- ▷ Stereo/Mono conversions
- ▷ Surround down mixing
- ▷ Static gain adjustment
- ▷ Delay adjustment
- ▷ Automatic loudness control
 - ▷ EBU R128
 - ▷ A-weighting

▷ *WebTV Scrambling*

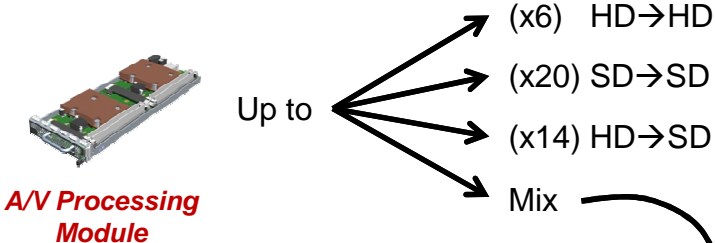
- ▷ AES128 scrambling
- ▷ Apple HLS encryption
- ▷ Microsoft PlayReady DRM
- ▷ MPEG-CENC for MPEG-DASH

BROADCAST



BROADCAST

▷ *Density*



SD→SD	20	16	13	10	6	3	0
HD→HD	0	1	2	3	4	5	6

(x6) SD→SD
+
(x4) HD→HD

Indicative examples

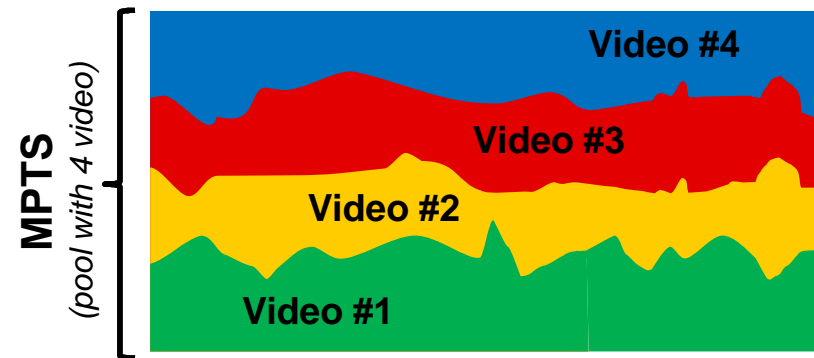
BROADCAST

▷ *FLEXTREAM Statistical multiplexing*

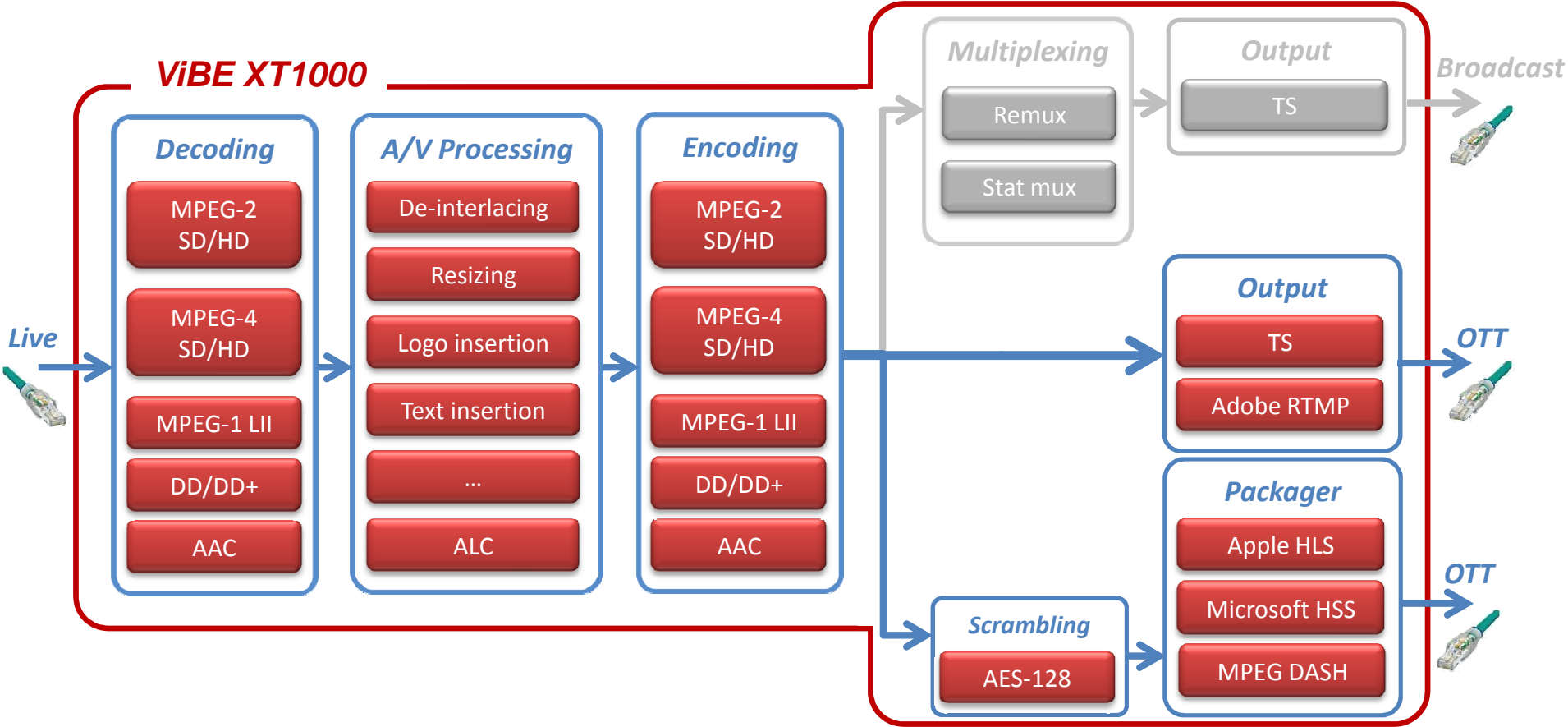
- ▷ Internal statistical multiplexing
- ▷ Complexity requests from video encoders
 - ▷ MPEG-2 SD and HD
 - ▷ MPEG-4/AVC SD and HD
- ▷ Dynamic bit-rate allocation for each internal video encoder

▷ *Allocator parameters*

- ▷ Name
- ▷ Total bit rate
- ▷ For each Video Elementary Stream
 - ▷ Minimum/Maximum bit rate
 - ▷ Quality target



MULTI-SCREEN











MULTI-SCREEN








▷ *Density*

-  HD
-  SD
-  Low Res




Case #1

 Profile 1	1920 x 1080p25
 Profile 2	1280 x 720p25
 Profile 3	1280 x 720p25
 Profile 4	960 x 540p25
 Profile 5	704 x 396p25
 Profile 6	640 x 360p25
 Profile 7	640 x 360p25
 Profile 8	340 x 192p25

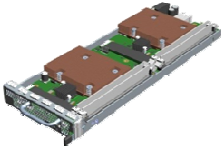
Case #2

 Profile 1	1280 x 720p25
 Profile 2	960 x 540p25
 Profile 3	704 x 396p25
 Profile 4	640 x 360p25
 Profile 5	512 x 288p25
 Profile 6	448 x 252p25
 Profile 7	384 x 216p25

Case #3

 Profile 1	640 x 480p25
 Profile 2	480 x 320p25
 Profile 3	480 x 320p25

A/V Processing Module



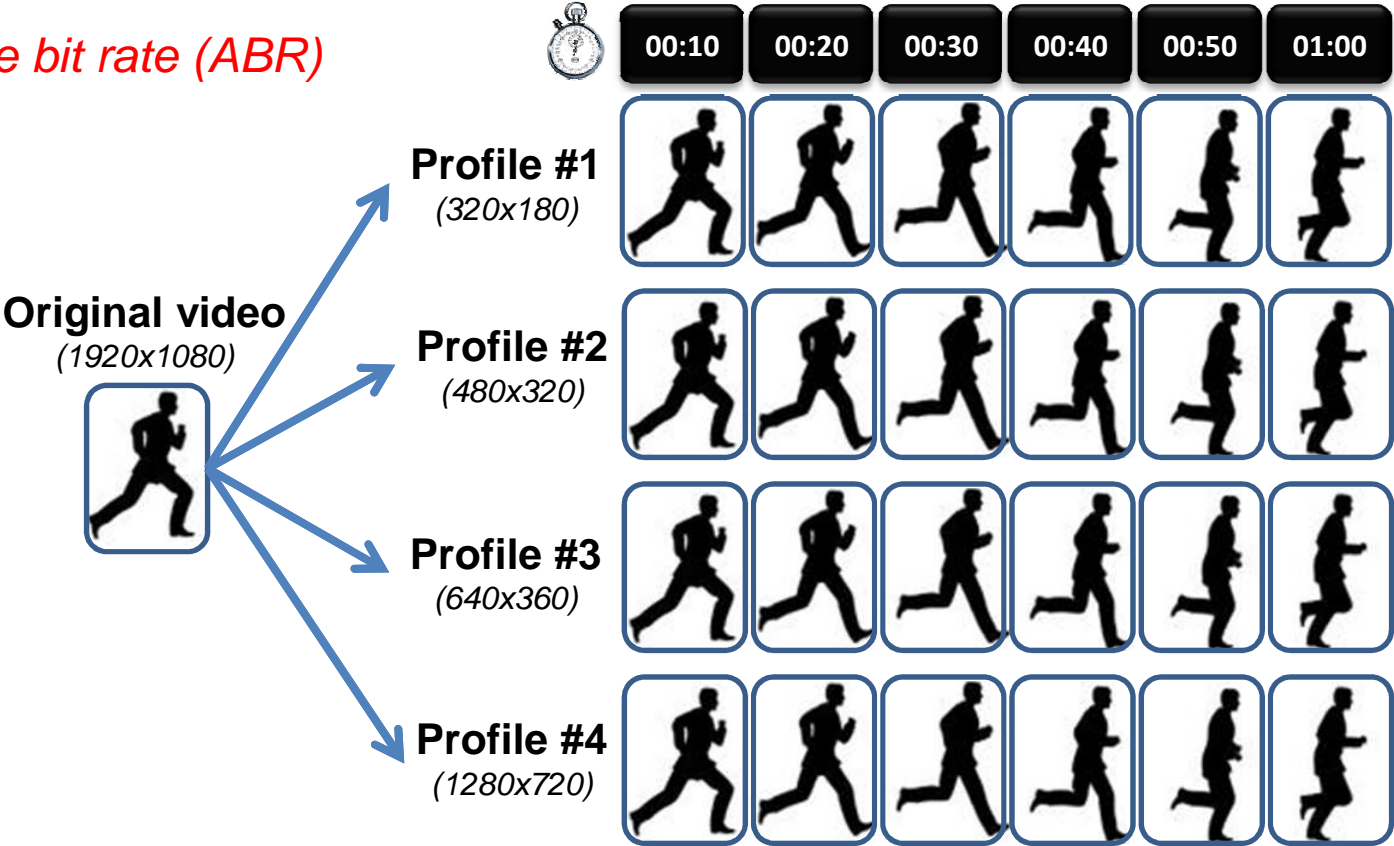
x2 channels

x4 channels

x10 channels

MULTI-SCREEN

▶ Adaptive bit rate (ABR)



MULTI-SCREEN

▷ *Multiple video encoding profiles according to*

- ▷ Resolution
 - ▷ from 64x64 to 1920x1080
 - ▷ 2x2 pixel resolution step
- ▷ Frame rate
 - ▷ From 5 fps to 60 fps
- ▷ Bit rate

**Synchronization (alignment)
between profiles**

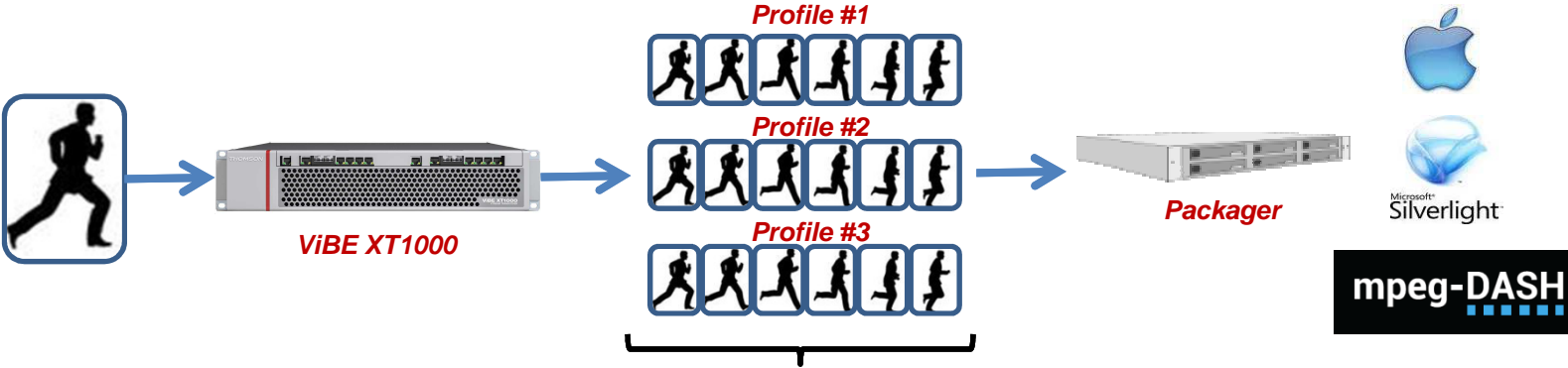
▷ *Multiple audio encoding profiles according to*

- ▷ Bit rate

MULTI-SCREEN

▷ *Delivery to external Packager*

- ▷ Transport Stream with EBP
- ▷ Real Time Messaging Protocol



CableLabs
OC-SP-EBP-I01-130118

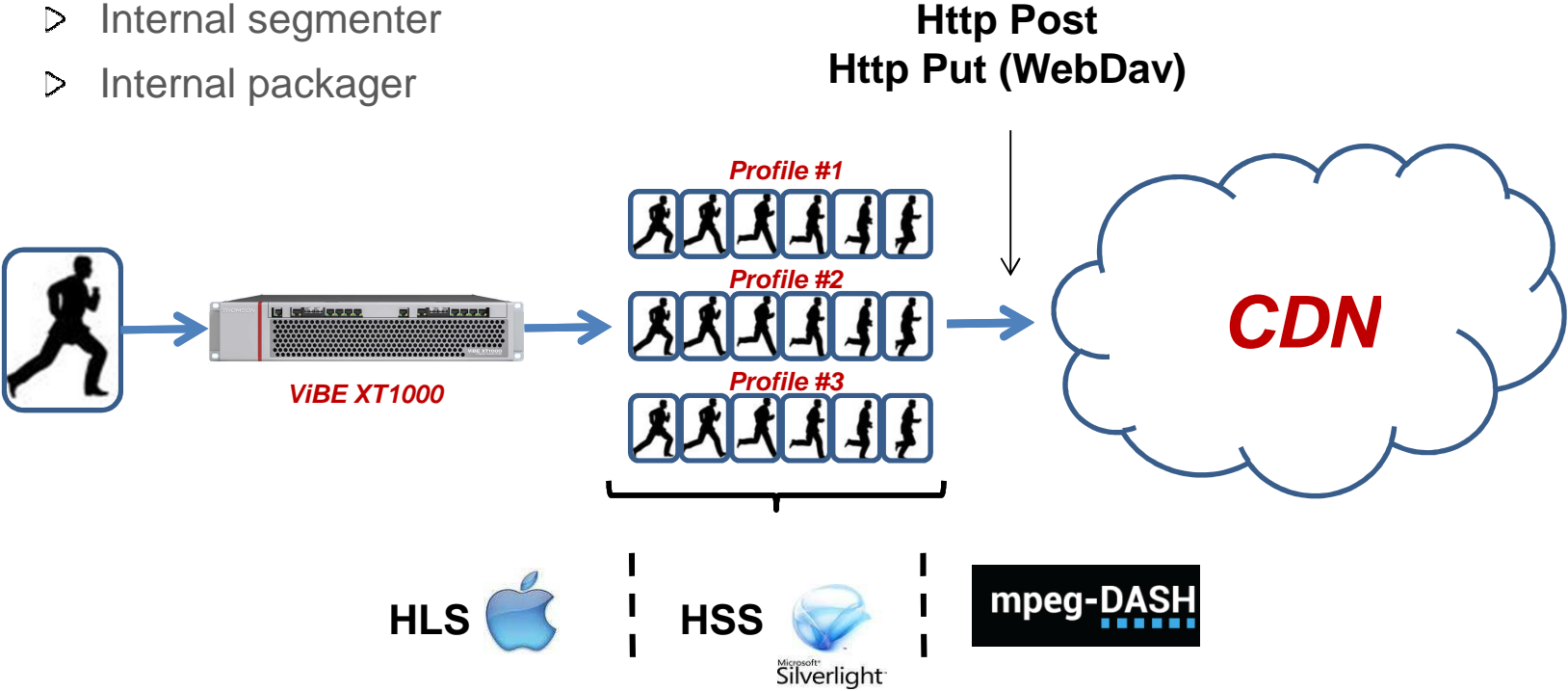
Transport Stream with EBP
(Encoder Boundary Point)

RTMP

MULTI-SCREEN

▷ *Delivery to CDN*

- ▷ Internal segmenter
- ▷ Internal packager



MULTI-SCREEN

▷ *Integrated into a wide ecosystem*

- ▷ CDN service provider / Product provider

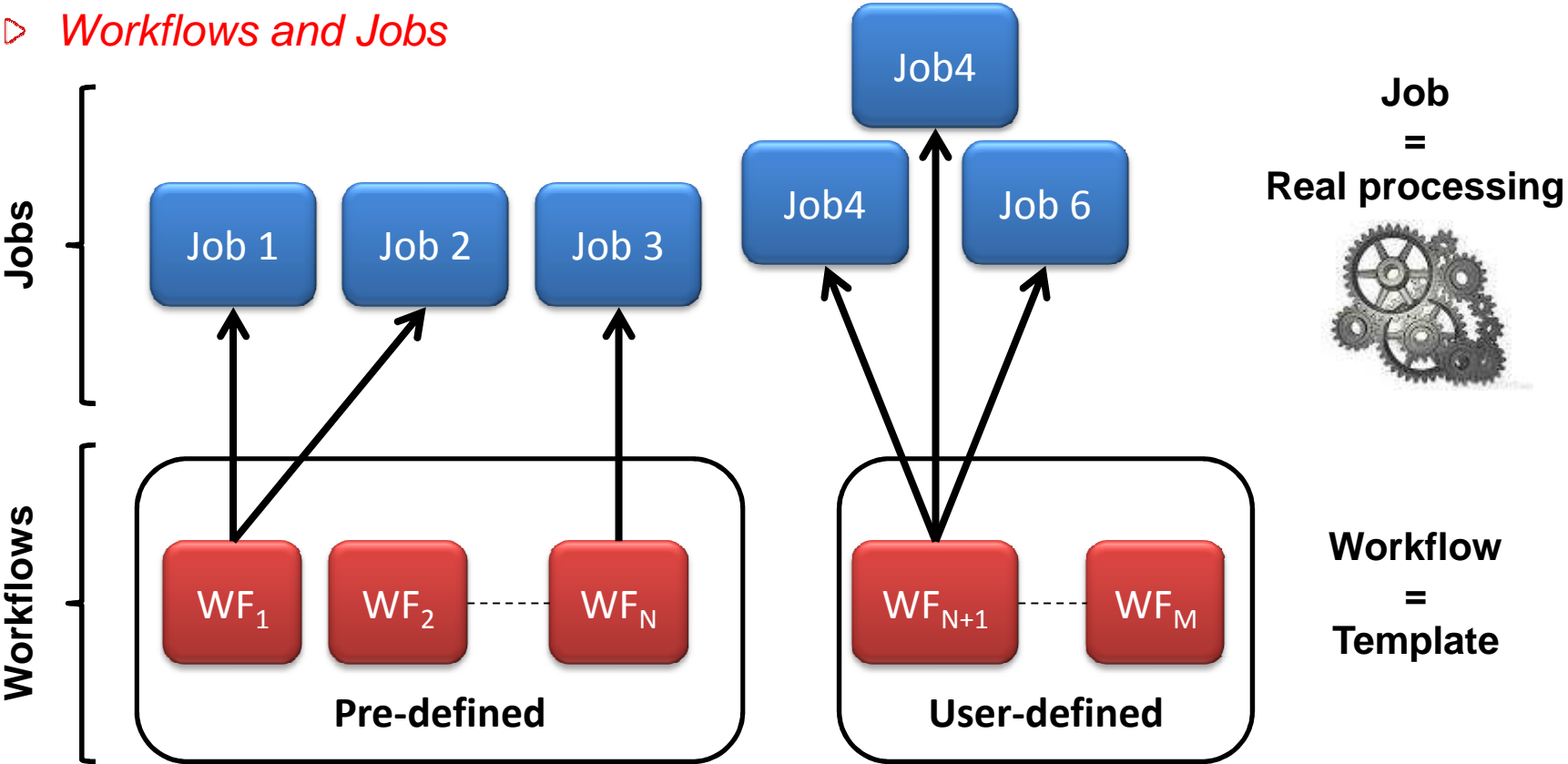


- ▷ CAS/DRM providers



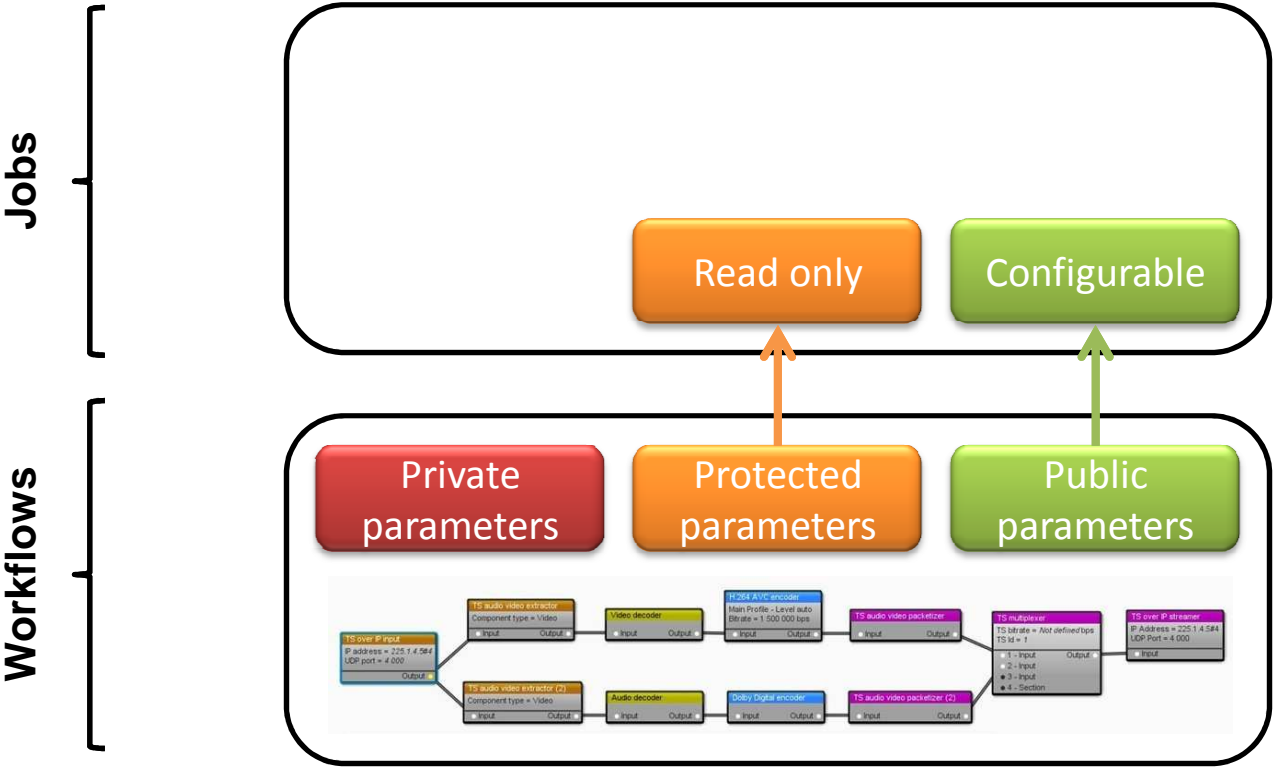
HOW TO OPERATE

▷ Workflows and Jobs



HOW TO OPERATE

Workflow and Jobs



Job
=
Real processing



Workflow
=
Template

HOW TO OPERATE

▶ Workflow Builder

The screenshot displays the Thomson VIBE XT1000 Xtream Transcoder Workflow Builder interface. The main window shows a workflow diagram with the following components:

- Inputs:** Two 'TS over IP input' blocks. The first is selected, showing its properties in a pop-up window.
- Processors:** Two parallel paths. The top path includes 'TS audio video extractor', 'Video decoder', 'H.264 AVC encoder', and 'TS audio video packetizer'. The bottom path includes 'TS audio video extractor (2)', 'Audio decoder', 'Dolby Digital encoder', and 'TS audio video packetizer (2)'.
- Output:** A 'TS multiplexer' block that combines the outputs of both paths, followed by a 'TS over IP streamer' block.

The 'Properties of TS over IP input' window is open, showing the following parameters:

Name	Default value	Publish	Label	Value restriction	Condition	Sum...
IP address	225.1.4.5#4	public				
UDP port	4 000	private		[0 to 65535]		
Select source IP address	false	private		[true ; false]		
Synchro loss threshold	500 ms	private		[0 to 65535]		
Maximum TS bitrate	0 bps	private		[0 to 200000000]		
Define backup input	false	private		[true ; false]		
Monitoring view	true	private		[true ; false]		
Standard	DVB	private		[MPEG-2 ; DVB ; ATSC]	Monitoring view == true	Moni...

HOW TO OPERATE

▶ Job Manager

Jobs List
With status

Job id	Job name	Status	State	Workflow
914	MPTS1	Stopped	Stopped	MPTS over IP output
932	SortieVideoChezSeb_Id11	Stopped	Stopped	SortieSeu_VLC_SBR
1336		Stopped	Stopped	SortieSeu_VLC_SBRCopy
1728		Stopped	Stopped	SortieSeu_VLC_SBRCopy
1935		Stopped	Stopped	MYWorkflowJGI
2047		Stopped	Stopped	MYWorkflowJGI
2102		Stopped	Stopped	ConsoCPU_Live WebTV Transcoder
2106	Snapshot for @225.2.2.2#189:2001	Stopped	Stopped	TS over IP input
2108	Snapshot for @234.189.180.5#189:...	Running	Running	TS over IP input
2109	Manual snap for @234.189.180.5#1...	Running	Running	TS over IP input
2129		Stopped	Stopped	GJA SapphireUncompAudioSplicingMultiAudio
1083		Stopped	Stopped	BTO_PipoStringList
1541		Stopped	Stopped	Mux Audio Video
1644		Stopped	Stopped	CondSurInputEMultiDevant

Parameters

Workflow: MPTS over IP output

Name: MPTS1

MPTS name: MPTS1

TS bitrate: 300 888 bps

Statmux pool global bitrate: 808 888 bps

TS id: 10 000

PAT period: 110 ms

PMT period: 222 ms

Standard: MPEG-2

Generate SDT:

IP address: 225.1.4.6#191

UDP port: 4000

Source IP address: auto

Define backup output:

TTL: 32

Job information
Settings and logs

HOW TO OPERATE

▶ *Managing users and rights*

- ▶ Configuration and monitoring
- ▶ System, Workflow & Job rights

▶ *Managing software releases and user licenses*

- ▶ Scalable licensing
- ▶ Seamless upgrade

License	Description
NXT1KL00AA	XT1000-LIC-DEC-HD : This option enables MPEG-2/MPEG-4 HD decoding. 4:2:0 format. One license is required per video decoding.
NXT1KL10AA	XT1000-LIC-ENC-HD : This option enables MPEG-2/MPEG-4 HD encoding. 4:2:0 format. One license is required per video encoding.
NXT1KL01AA	XT1000-LIC-DEC-SD : This option enables MPEG-2/MPEG-4 SD decoding. 4:2:0 format. One license is required per video decoding.
NXT1KL11AA	XT1000-LIC-ENC-SD : This option enables MPEG-2/MPEG-4 SD encoding. 4:2:0 format. One license is required per video encoding.
NXT1KL12AA	XT1000-LIC-ENC-LR : This option enables MPEG-4 low resolution encoding (up to QVGA). 4:2:0 format. One license is required per video encoding.
NXT1KL20AA	XT1000-LIC-DEC-AUD20 : This option enables MPEG-1 L1 and AAC stereo decoding. One license is required per stereo audio decoding.
NXT1KL21AA	XT1000-LIC-DEC-DD20 : This option enables Dolby Digital and Dolby Digital Plus stereo decoding. One license is required per stereo audio decoding.
NXT1KL22AA	XT1000-LIC-DEC-AAC51 : This option enables AAC 5.1 decoding. One license is required per 5.1 audio decoding.
NXT1KL23AA	XT1000-LIC-DEC-DD51 : This option enables Dolby Digital and Dolby Digital Plus 5.1 decoding. One license is required per 5.1 audio decoding.

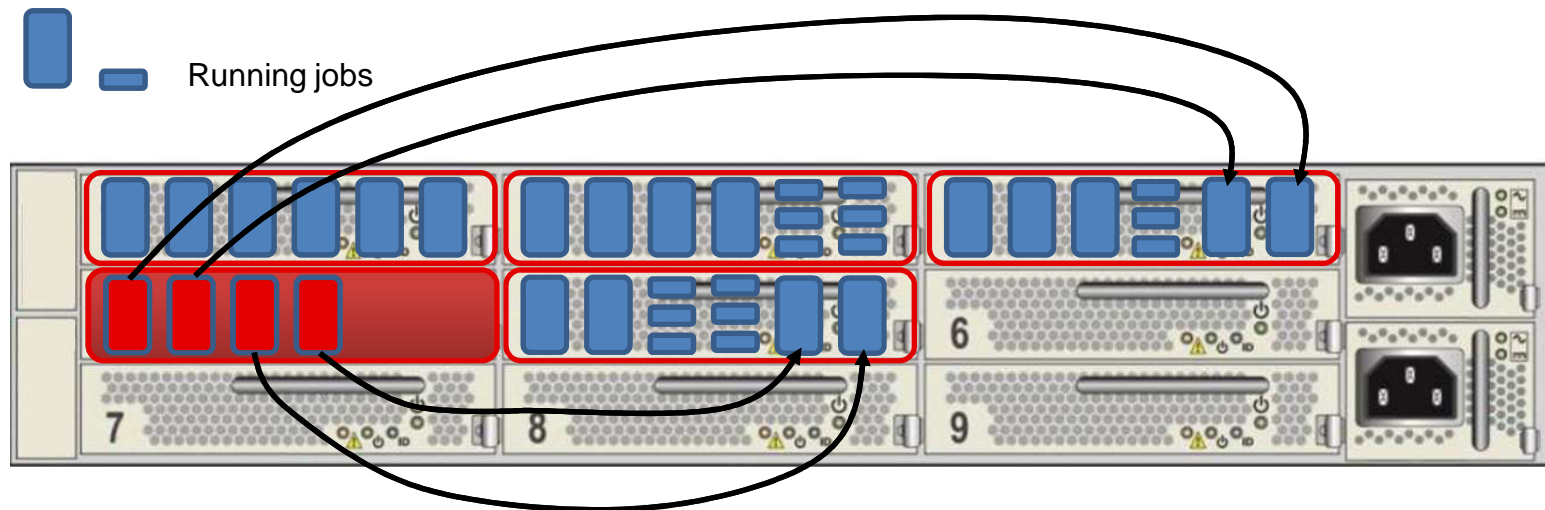
▶ *Monitoring Processing modules*

- ▶ CPU types
- ▶ Memory

ID	State	Stat...	CPU usage	Memory usage	CPU	Memory
Master			96 %	23 %	Intel(R) Core(TM) i7-4860EQ CPU @ 1.80GHz	16326.9 MBytes

INTERNAL REDUNDANCY

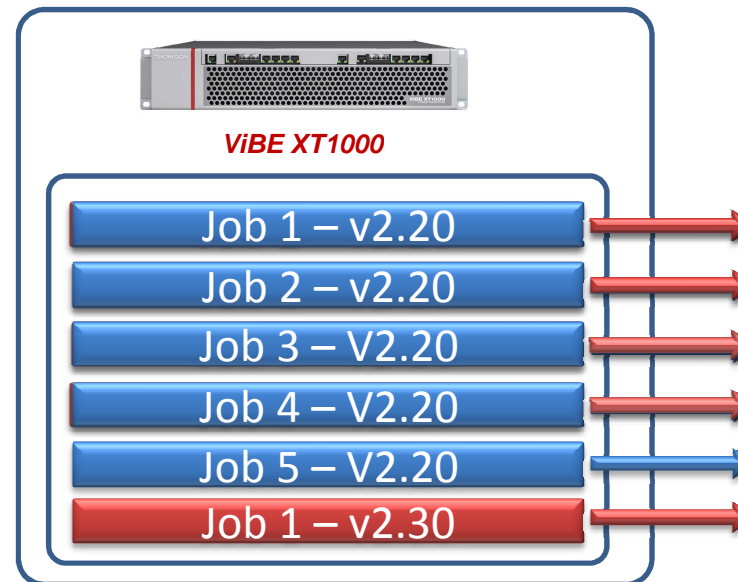
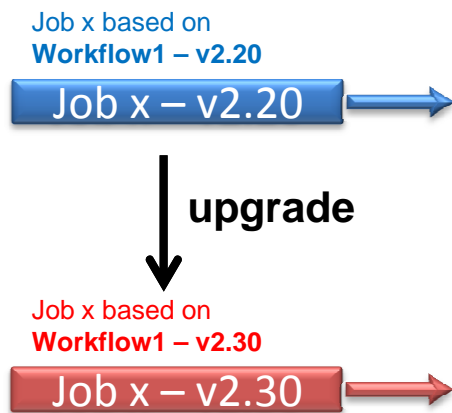
▷ *Automatic Internal redundancy*



Load Balancing + Internal Failover
Powered by MediaFlex^{OS}

SMOOTH UPGRADE

- ▷ *Smooth upgrade method to limit service downtime*
 - ▷ Automatic upgrade (job by job)
 - ▷ On the fly upgrade



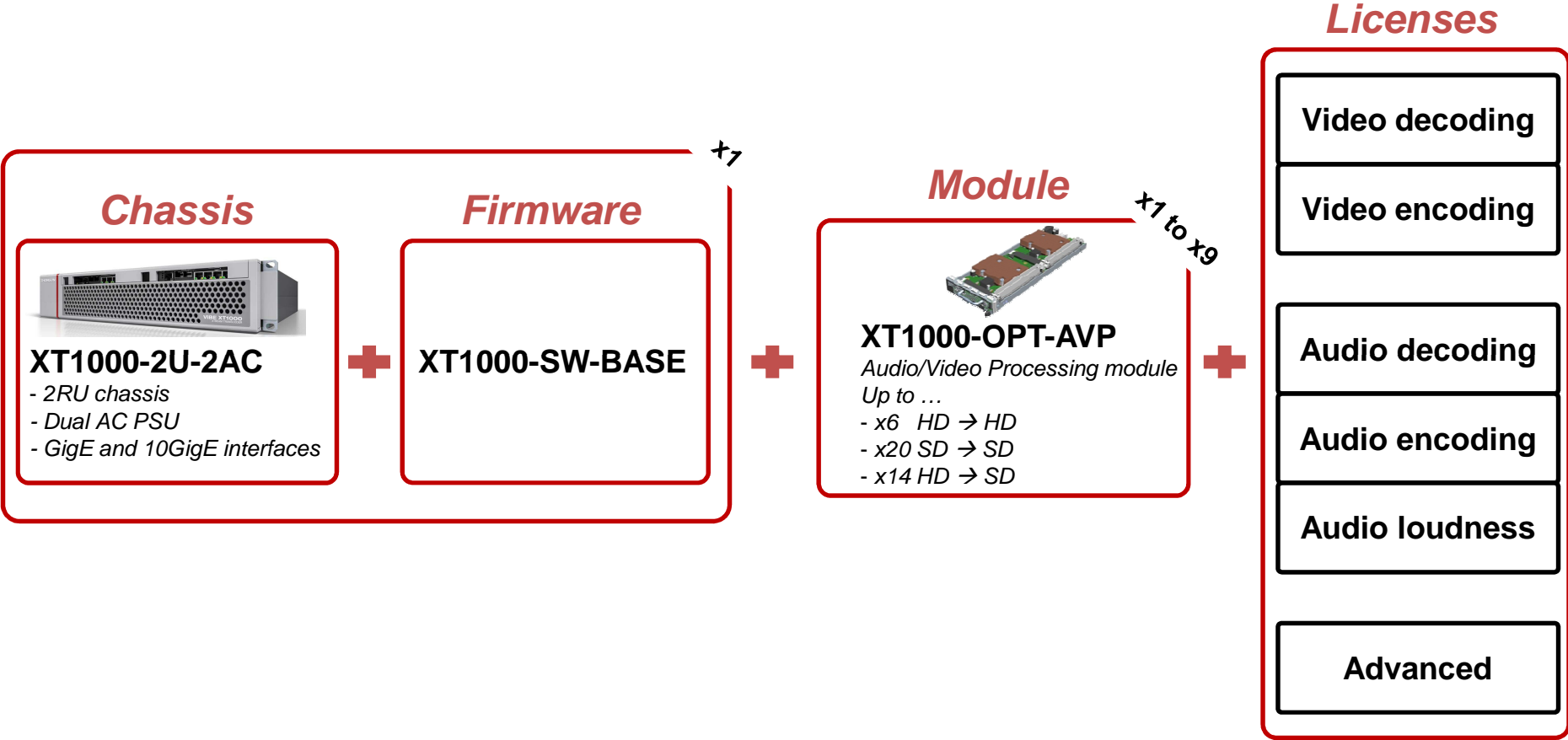
NETWORK MANAGEMENT SYSTEM

▷ *MEDIAFLEX*^{SUITE}

- ▷ From ViBE XT1000 v01.00
- ▷ Alarm monitoring included

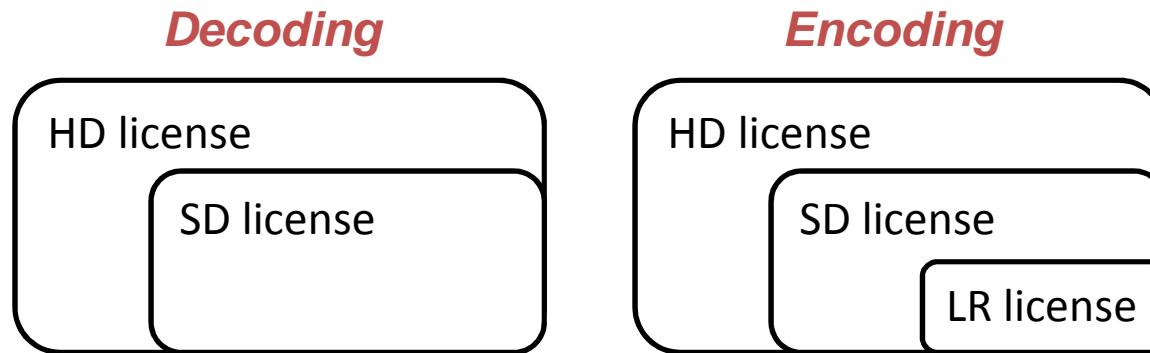


ORDERING GUIDE



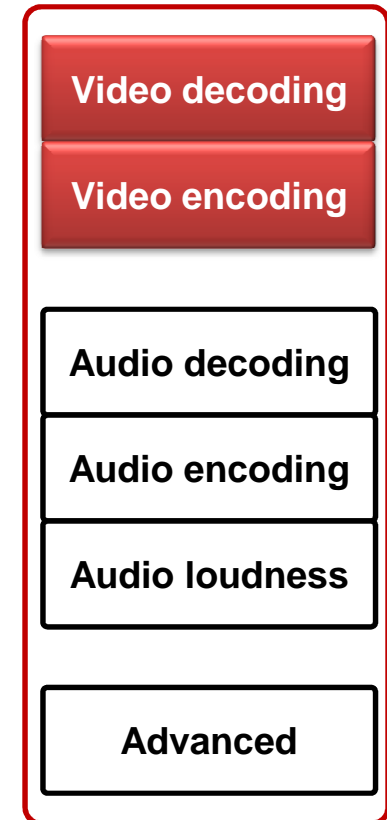
ORDERING GUIDE

▶ Video Licenses



- ▶ All licenses support MPEG-2 and MPEG-4
- ▶ Top-down principle for all licenses:
 - ▶ 1 HD channel license also covers 1 SD channel
 - ▶ Valid for both decoding and encoding

Licenses



ORDERING GUIDE

▷ **Audio License** → **5.1 license = 3 stereo licenses**

▷ Decoding (*one license per audio channel*)

- ▷ XT1000-LIC-DEC-AUD20 MPEG-1 Layer II Stereo, AAC stereo
- ▷ XT1000-LIC-DEC-DD20 Dolby Digital & DD+ stereo
- ▷ XT1000-LIC-DEC-AAC51 AAC 5.1
- ▷ XT1000-LIC-DEC-DD51 Dolby Digital & DD+ 5.1

▷ Encoding (*one license per audio channel*)

- ▷ XT1000-LIC-ENC-AUD20 MPEG-1 Layer II Stereo, AAC stereo
- ▷ XT1000-LIC-ENC-DD20 Dolby Digital & DD+ stereo
- ▷ XT1000-LIC-ENC-AAC51 AAC 5.1
- ▷ XT1000-LIC-ENC-DD51 Dolby Digital & DD+ 5.1

Licenses

Video decoding

Video encoding

Audio decoding

Audio encoding

Audio loudness

Advanced

ORDERING GUIDE

▶ *Audio License (cont'd)*

▶ Loudness Control (*one license per audio channel*)

- ▶ XT1000-LIC-ALC20 ALC on stereo
- ▶ XT1000-LIC-ALC51 ALC on 5.1

▶ *Advanced*

▶ Statistical Multiplexing (*one license per video channel*)

- ▶ XT1000-LIC-FLX Internal statistical multiplexing

▶ WebTV scrambling (*one license per WebTV output*)

- ▶ XT1000-LIC-SCR-OTT WebTV scrambling

Licenses

Video decoding

Video encoding

Audio decoding

Audio encoding

Audio loudness

Advanced

VIBE XT1000 VALUE PROPOSITION

High Density

- ✓ Up to 54 HD per 2RU
- ✓ Up to 180 SD per 2RU

Scalable

- ✓ Modularity A/V Processing module
- ✓ Decoding/Encoding licensing
- ✓ Field upgrade (in the rack)

Robust

- ✓ Internal redundancy by MediaFlex^{OS}
- ✓ Dual Management port
- ✓ Dual AC PSU

Flexible

- ✓ Broadcast and Multi-screen
- ✓ Any to any A/V transcoding



Green

- ✓ 6 W per SD
- ✓ Reduce rack space

Pay as you grow

- ✓ Decoding/Encoding licensing

Cost Effective

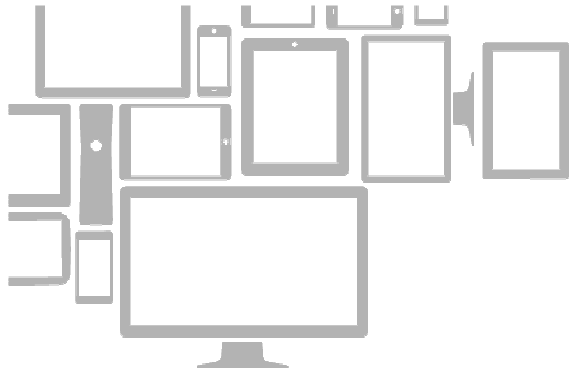
- ✓ Internal redundancy (1+1 not required)



BEHIND EVERY SCREEN

streamlined video delivery

THANK YOU



BACKUP SLIDES

12-Jan-15

SUBTITLES MANAGEMENT

		OUTPUT						
		Broadcast				Multi-screen		
		Video overlay	DVB Teletext	DVB Subtitles (bitmap)	Closed Captions	Apple HLS	MPEG DASH	Microsoft HSS
INPUT	DVB Teletext		Pass-through*			WebVTT	SMPTE-TT	DFXP
	DVB Subtitles (bitmap)	✓		Pass-through*		SMPTE-TT (proprietary)	SMPTE-TT	SMPTE-TT
	Closed Captions				Pass-through*	Pass-through*	Pass-through*	Pass-through*

* Resynchronization with video

TEXT INSERTION

- ▷ *Emergency Alert notification*
 - ▷ Meteorological alerts: Earthquake, Tsunami
 - ▷ Military alerts
 - ▷ Kidnapping

- ▷ *Text definition*
 - ▷ Manually in Web GUI
 - ▷ From file in network repository – On the fly

- ▷ *Configurable rendering*
 - ▷ Static position or crawling position (vertical, horizontal)
 - ▷ Font type, size and color
 - ▷ Background color and transparency



LOGO INSERTION

▷ Channel branding application

- ▷ Banner
- ▷ Logo

▷ Logo source

- ▷ From file in network repository
- ▷ Detection and update on the fly

▷ Configurable rendering

- ▷ Static position
- ▷ Transparency
- ▷ Entrance and exit effects



AUDIO LOUDNESS CONTROL

- ▷ *Constant audio level for better user experience*
- ▷ *Mono, Stereo and 5.1 supported*

- ▷ *Several loudness modes*

- ▷ Automatic Loudness control
 - ▷ EBU R28 / ITU 1770 (K-Weighting)
 - ▷ IEC 61672 (A-Weighting)
 - ▷ Flat model
- ▷ Static Loudness control
 - ▷ Per channel (Left, Right, Center, Left surround, Right Surround and LFE)
- ▷ Peak limiter

