



Presentation DAB Head End

Hermann ZENSEN, Sales Manager

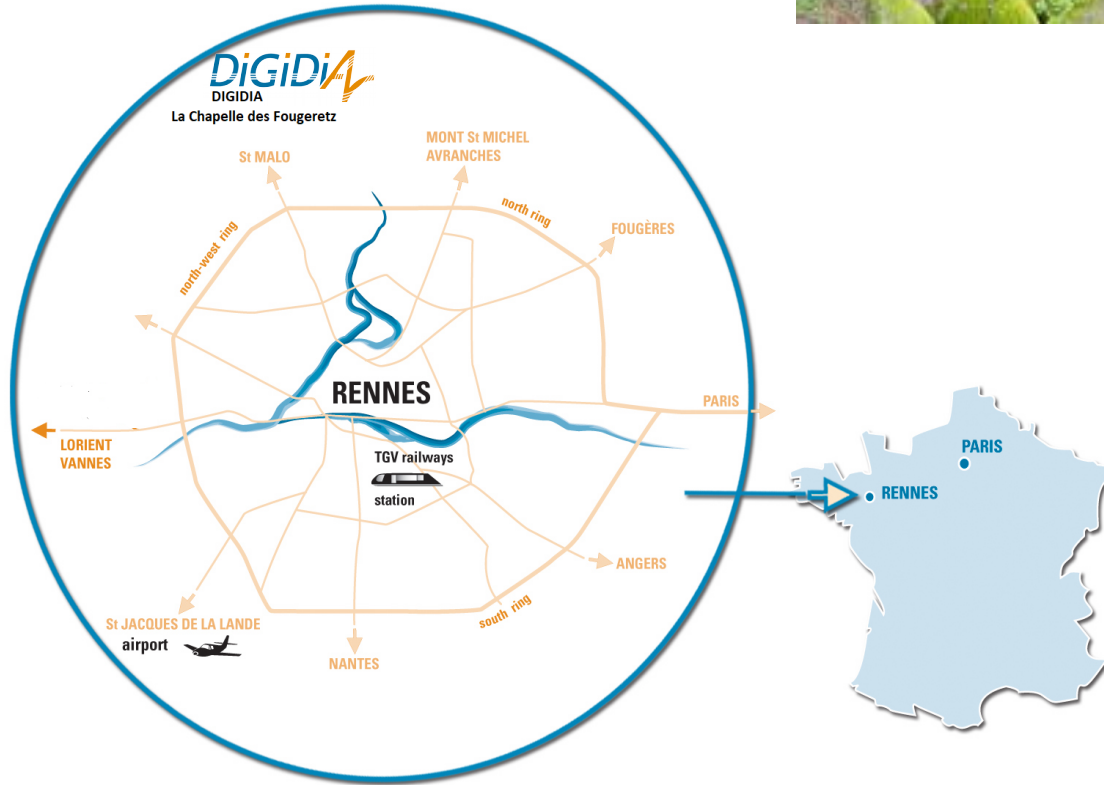
September 2020

Overview

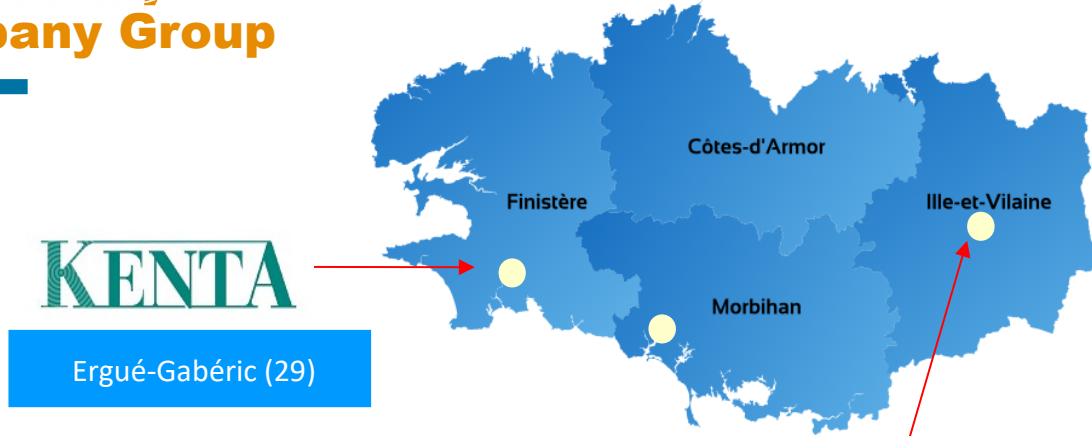
- **Company profile**
- **Head End Architectures**
 - **Centralized Architecture**
 - **Distributed Architecture**
- **Examples of DIGIDIA's Head End Realizations**
- **Conclusion**



Based in Brittany



/// Key Figures



Principal Markets:

- > GMDSS (Global Maritime Distress and Safety System)
- > Air Traffic Monitoring System
- > Inland Waterways Communication Systems
- > Defense & Aerospace
- > Test Laboratory



La Chapelle des Fougeretz (35)

Principal Markets:

- > Digital Radio Transmission
- > Synchronous FM
- > Transportation and public safety
- > Defense & Aerospace



14
Employees



2.5M€
Turnover



+50%
Exportation



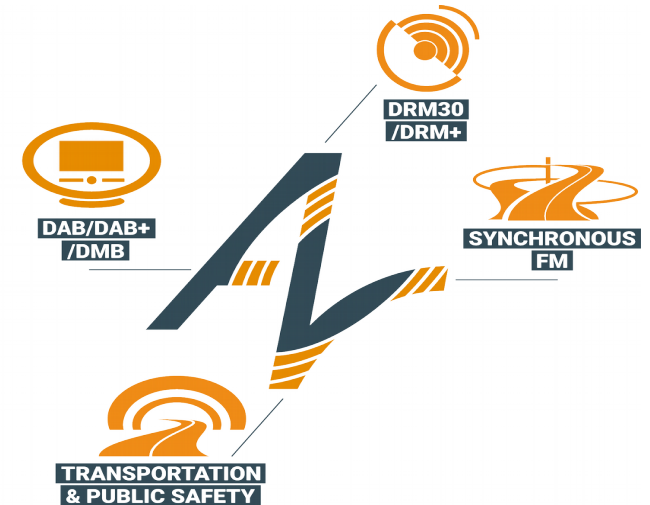
+150
Customers



2
Sites

More than 15 years of Innovation, On-going Investment and International Presence

- Founded in 2005 by 4 former Harris/Gatesair employees
- R&D Oriented:
 - All products (HW & SW) are developed and designed internally
- Skill domains:
 - HW and SW Engineering
 - Digital Signal Processing
 - Embedded real time software (on PC or dedicated platform)
 - Software Defined Radio (SDR) Expertise
 - Expertise in modulation / demodulation COFDM/FM/AM/MFSK etc.
 - Expertise in IP based technologies
 - High Level Graphical User Interfaces (IHM, PC SW)





Key Products



**TRANSPORTATION
& PUBLIC SAFETY**

Tunnel Break-in System

- **DAB-BI 2.0:** DAB/DAB+/DMB Tunnel Break-in System



**SYNCHRONOUS
FM**

Head-end Platform; Decoder/Digital Exciter

- **SYNCFM:** Synchronous FM Decoder & FM Digital Exciter



- **SPANFM:** Synchronous FM Head-end

“Very Compact & Straight Forward Products”



**DAB/DAB+
/DMB**

Encoding & Multiplexing Platform; IP Gateway; Professional Receiver

- **FLEXIDAB:** DAB/DAB+/DMB Head-end System



- **EASYWAY:** DAB/DAB+/DMB EDI/ETI Gateway

- **EASYSKY:** DAB/DAB+/DMB RF/EDI/ETI Monitoring Receiver



**DRM30
/DRM+**

Content Server; Modulator/Exciter; Professional Receiver

- **ALTO:** DRM/DRM+ Content Server
- **SOPRANO:** DRM/DRM+ Modulator/Exciter
- **EASYSKY DRM PRO:** DRM/DRM+ RF Monitoring Receiver



“Control & Monitoring By WEB & SNMP”



Worldwide Sales

/// DAB Head End: “More than **50** DAB multiplexers and **400** DAB encoders”

/// DAB Tunnel break in: “More than **160** in products”



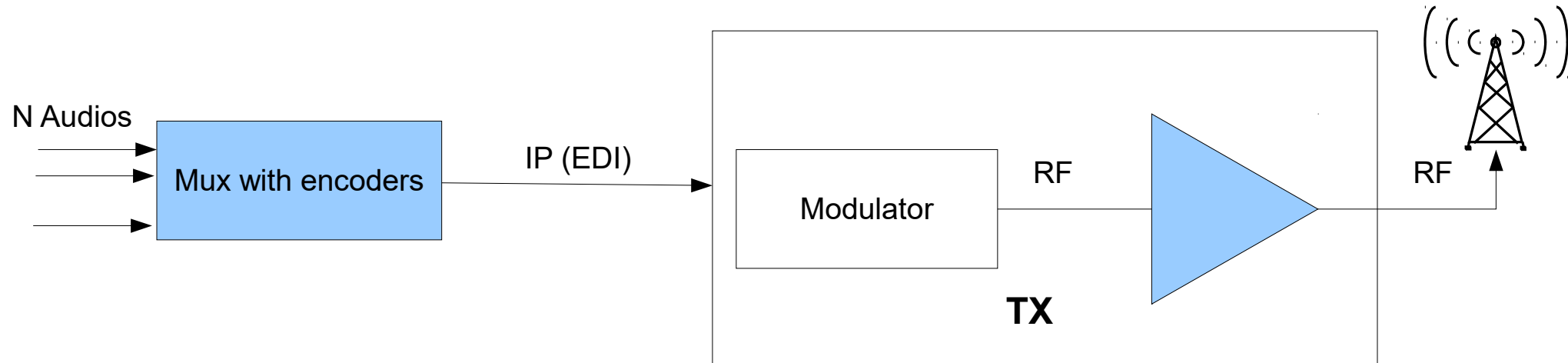
- Tunnel Break-in
- DAB/DAB+/DMB
- DRM/DRM+
- Synchronous FM
- ◆ GMDSS

/// DRM: “More than **100** DRM content servers and **100** DRM modulators”

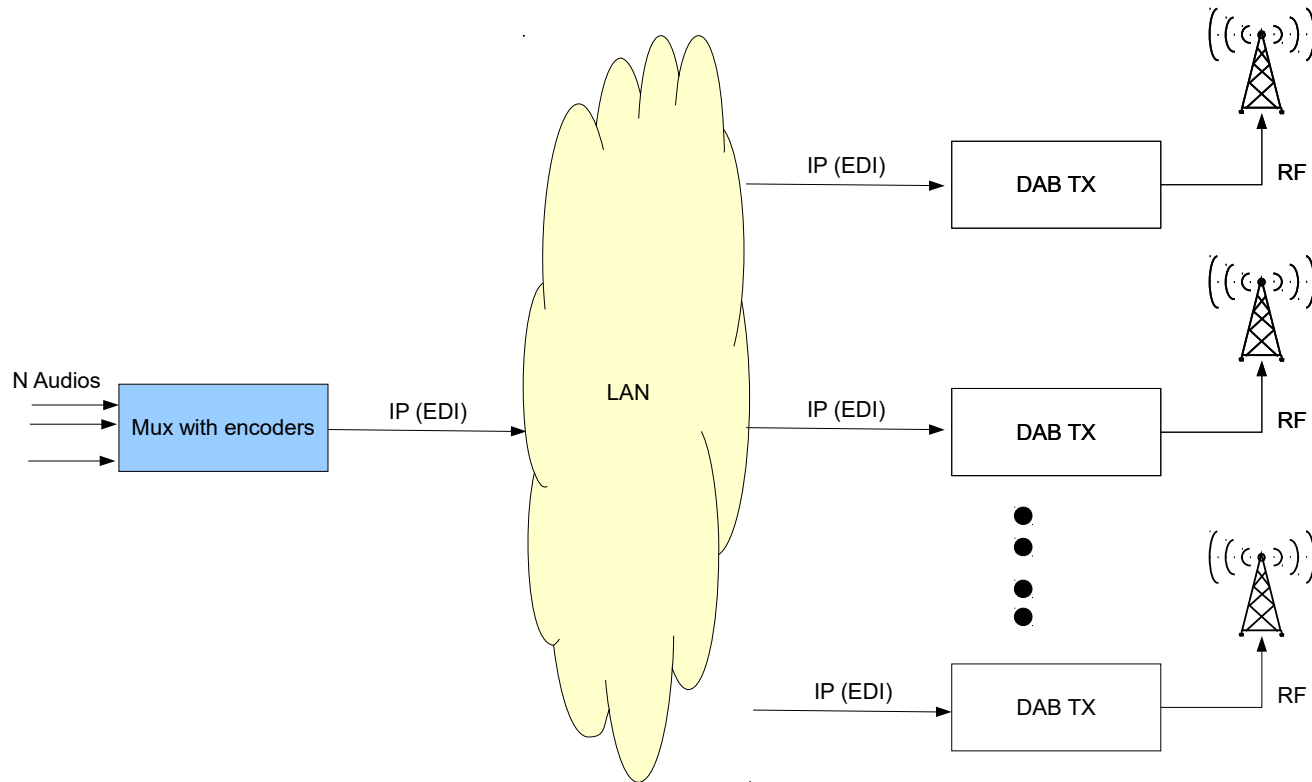
/// “Synchronous FM: More than **50** head ends and **700** exciters”

DAB Head End Architectures

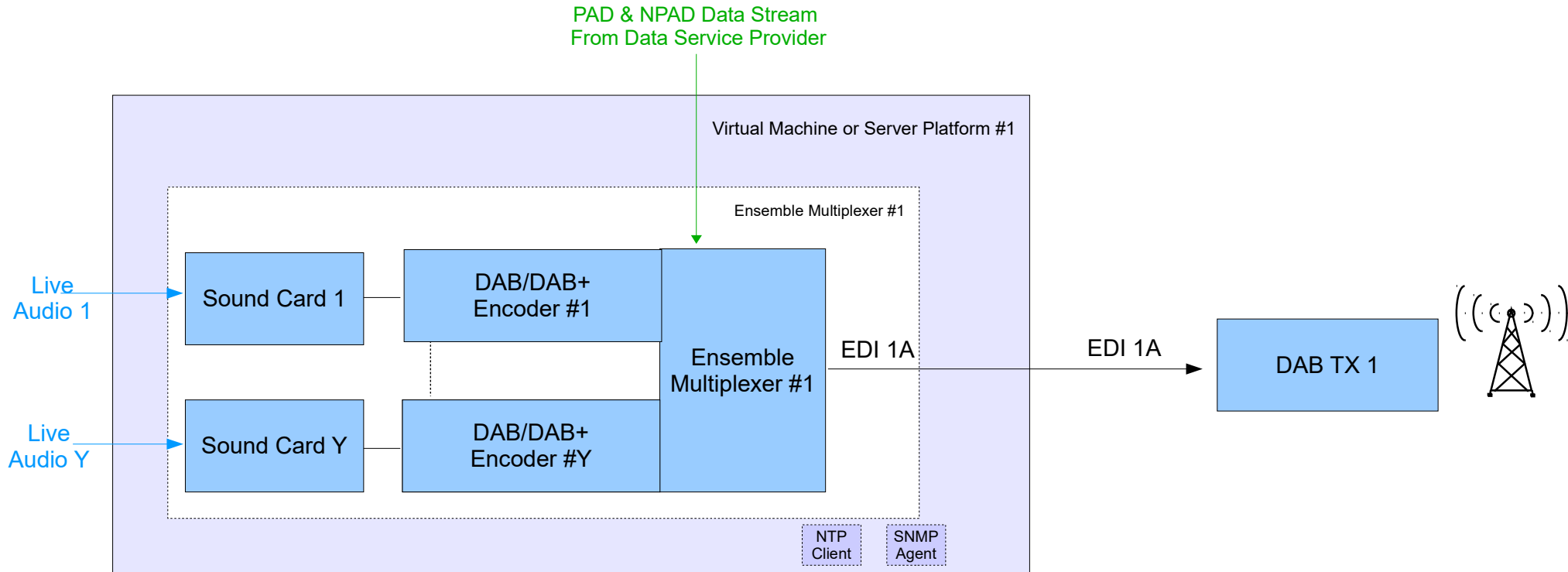
The Minimal System



System with Multiple Transmitters

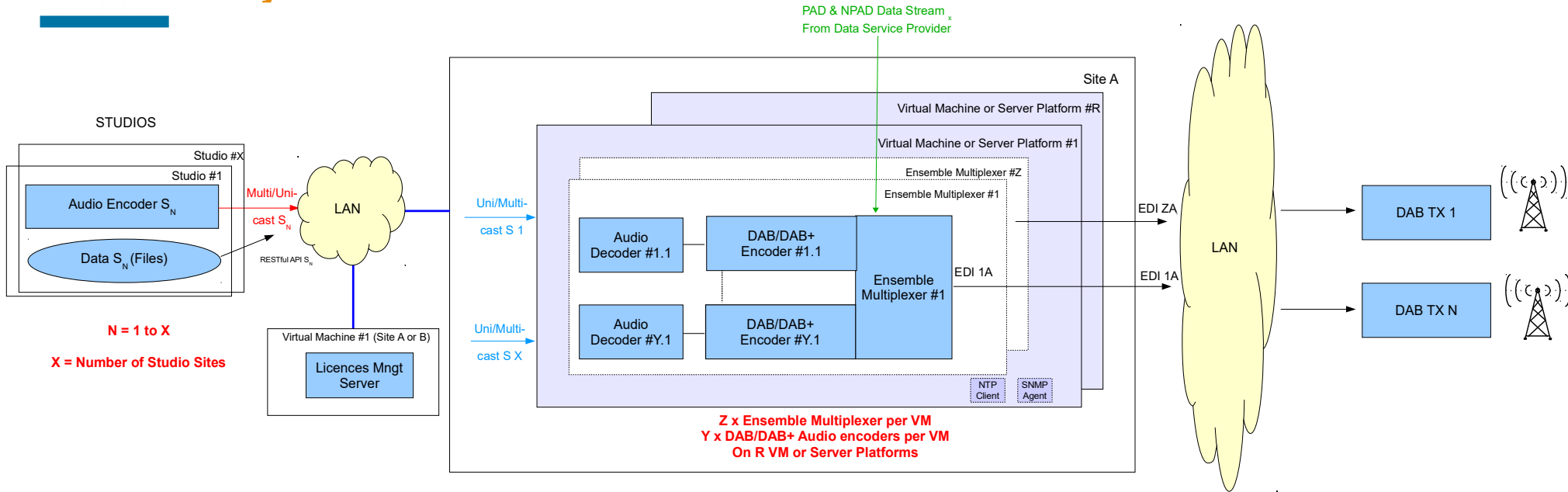


The Minimal System II



1 multiplexer with live audio inputs and Y x DAB/DAB+ Audio encoders on a server platform on one transmitter

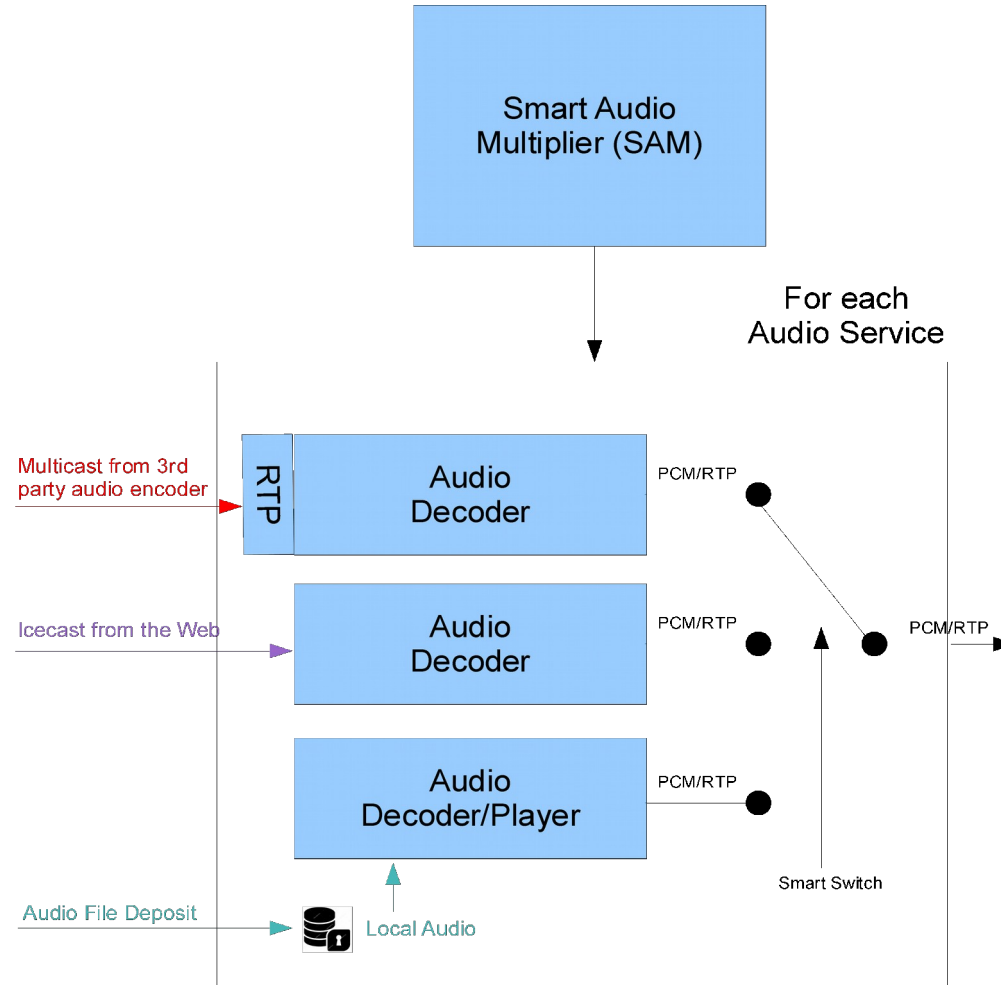
Simple Centralized System



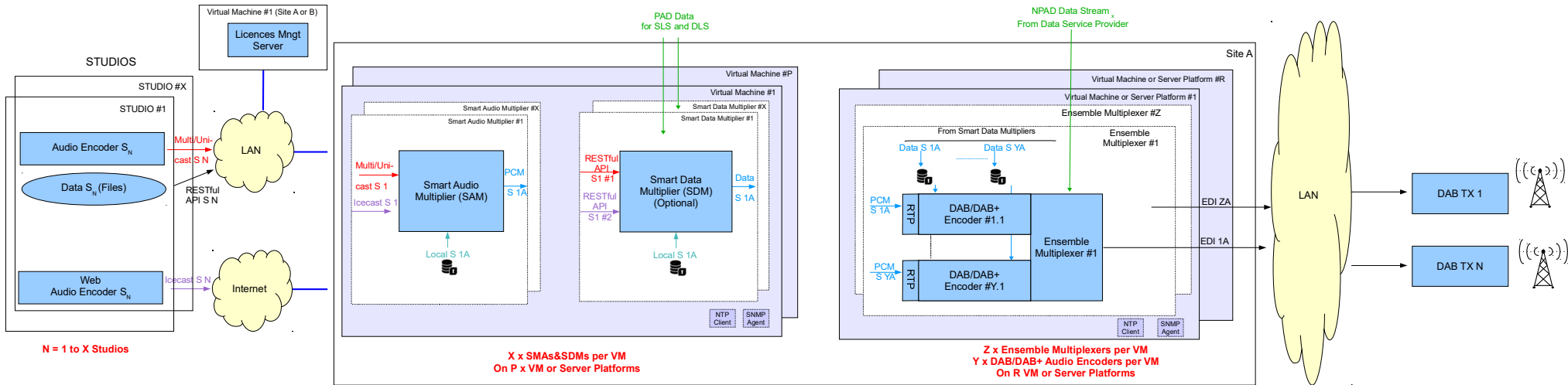
Standard Audio Codecs
(AES 67, MP3 over Icecast
(incl. Metadata for PAD),
MP3 over RTP, AAC over
RTP, MP3/AAC over
MPEG-TS and RTP....

Dedicated DAB Products

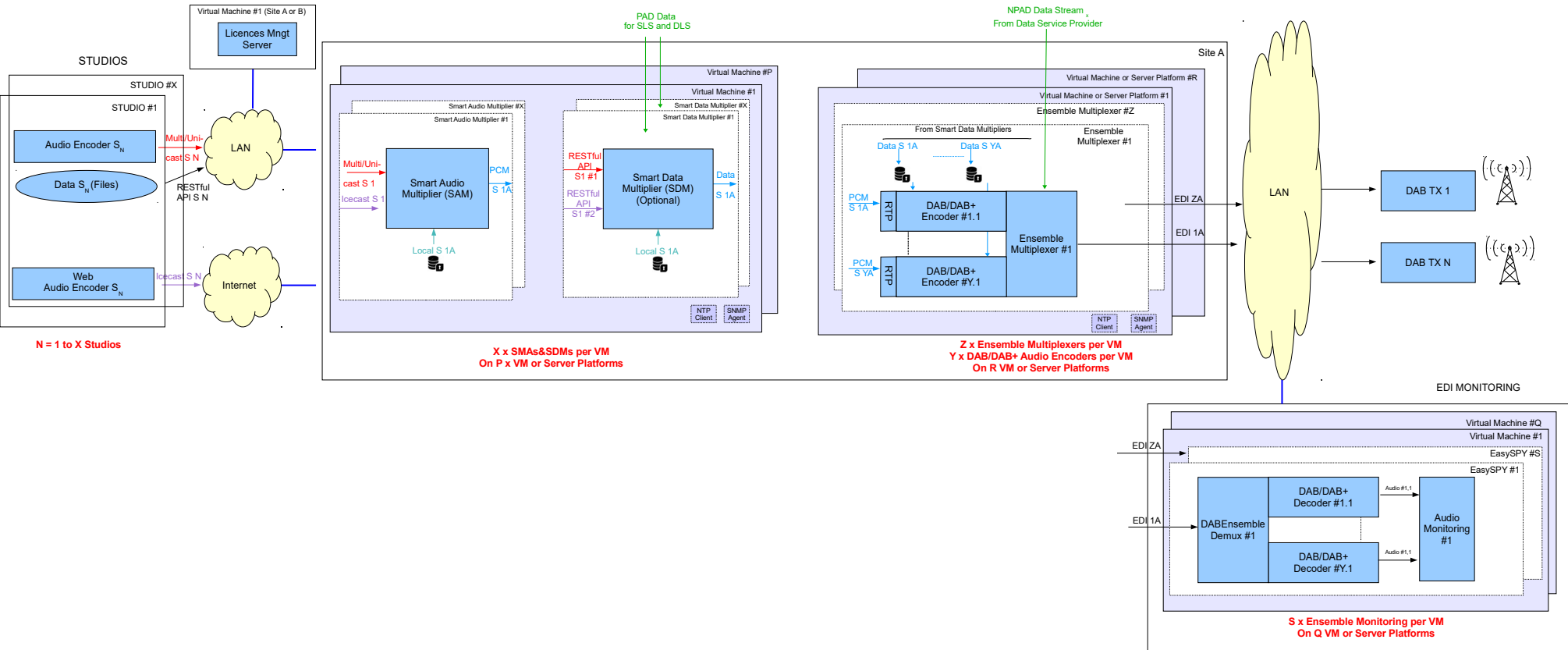
Smart Audio Multiplier



Centralized System with Input Redundancy



Centralized System with Input Redundancy And Monitoring



Audio Monitoring - IBC MUX Show Multiplex View Show Services View (All elements are displayed)

DeEnsemble: Demux 1 (Oslo/Akers/Østf) ETI SYNC AUDIO 17/06/2020 15:26:54 UTC

| | | | | | | | | |
|-----------|-----------|------------|--------------------|-------------------|--------|----------------|--------------|-------------------|
| | | | | | | | | |
| 1: NRK P2 | 2: NRK P3 | 3: NRK mP3 | 4: NRK Radio Super | 5: CNRKNRKNRKNRKN | 0: EPG | 12: SubChId 12 | 8: SubChId 8 | 9: NRK Båtvær Sør |

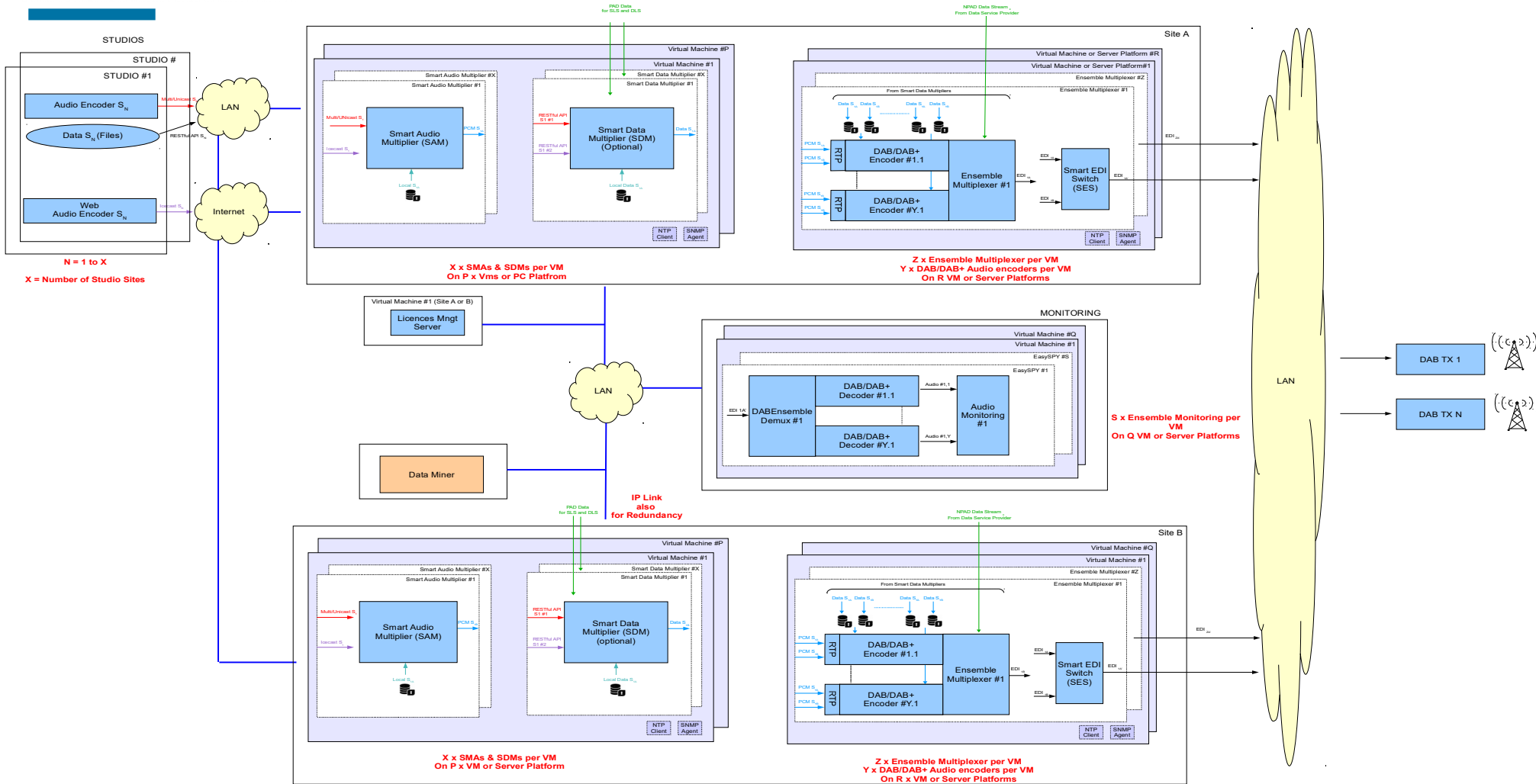
DeEnsemble: Demux 2 (Oslo/Akers/Østf) ETI SYNC AUDIO 17/06/2020 15:26:54 UTC

| | | | | | | | | |
|--------------|--------------|-------------------------------|--------------|-------------------|--------------|--------------|----------------|----------------|
| | | | | | | | | |
| 1: SubChId 1 | 2: SubChId 2 | 3: Welcome on Digidia Radio 1 | 4: SubChId 4 | 5: CNRKNRKNRKNRKN | 6: SubChId 6 | 7: SubChId 7 | 12: SubChId 12 | 13: SubChId 13 |

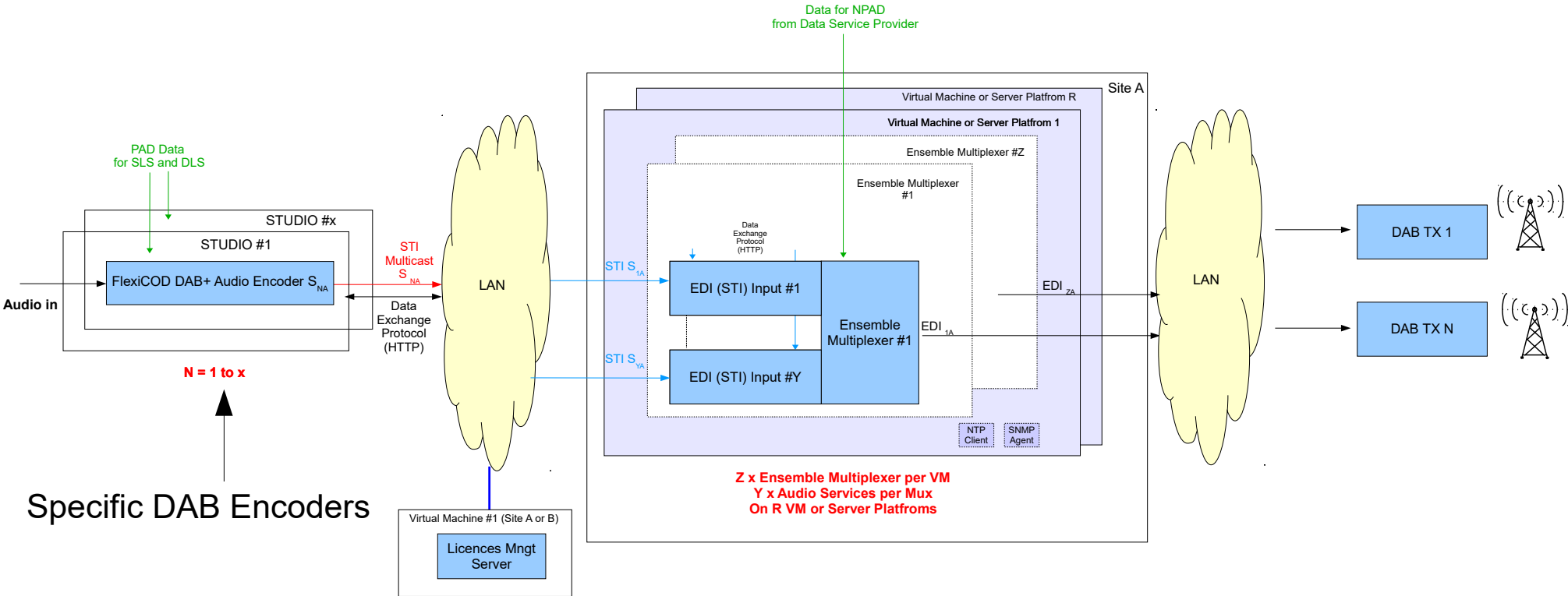
DeEnsemble: Demux 3 (Test Mux 3) ETI SYNC AUDIO 17/06/2020 15:26:54 UTC

| | | | | | |
|--------------|--------------|--------------|--------------|-------------------|--------------|
| | | | | | |
| 1: SubChId 1 | 2: SubChId 2 | 3: SubChId 3 | 4: SubChId 4 | 5: CNRKNRKNRKNRKN | 6: SubChId 6 |

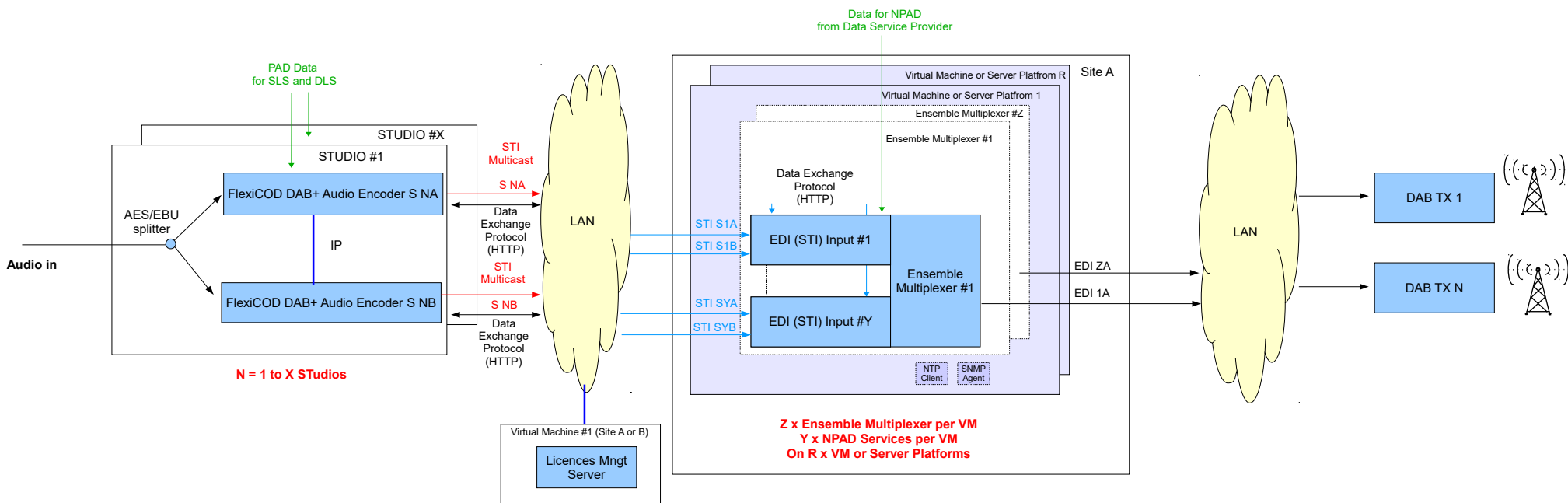
Redundant Centralized Architecture



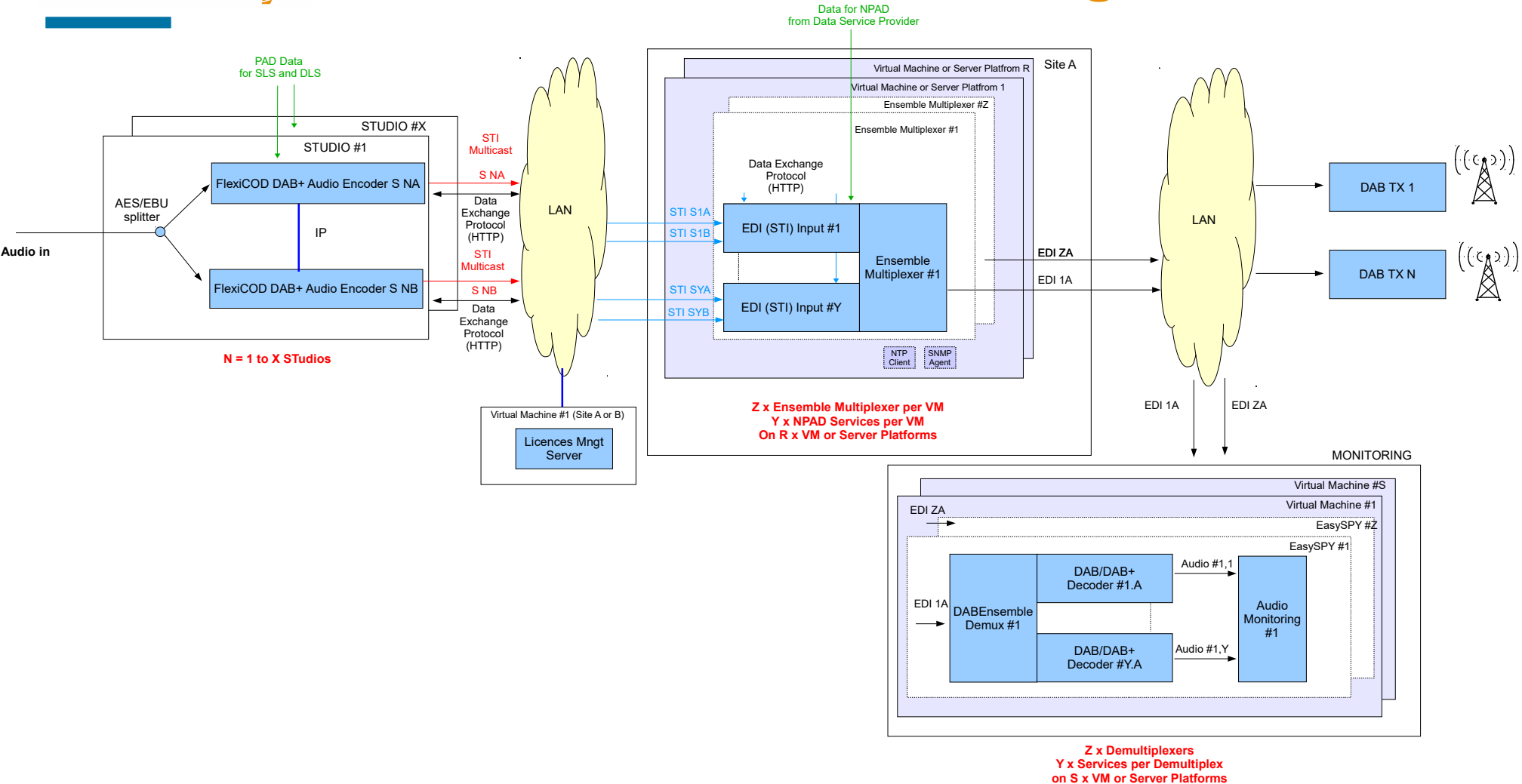
Simple Distributed Architecture



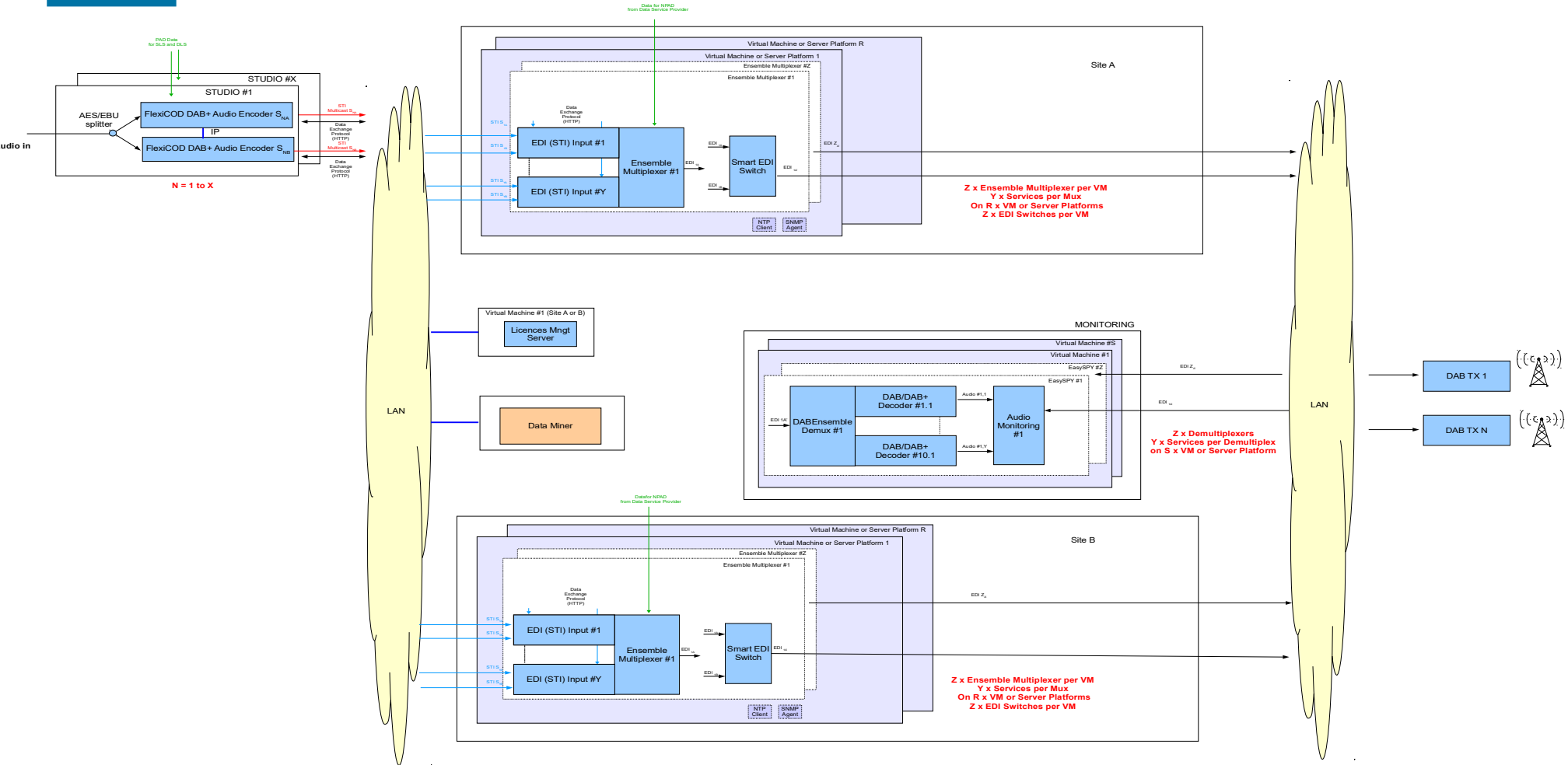
DiGiDiA Distributed Architecture with STI Redundancy



Distributed Architecture with STI Redundancy and Monitoring



Redundant Distributed Architecture



No transcoding in the distributed architecture.

But communication between the multiplexer and the distributed encoders can be very complex and is not standardized. Especially if the studio are allowed to change parameters (bit rate, protection rate,)

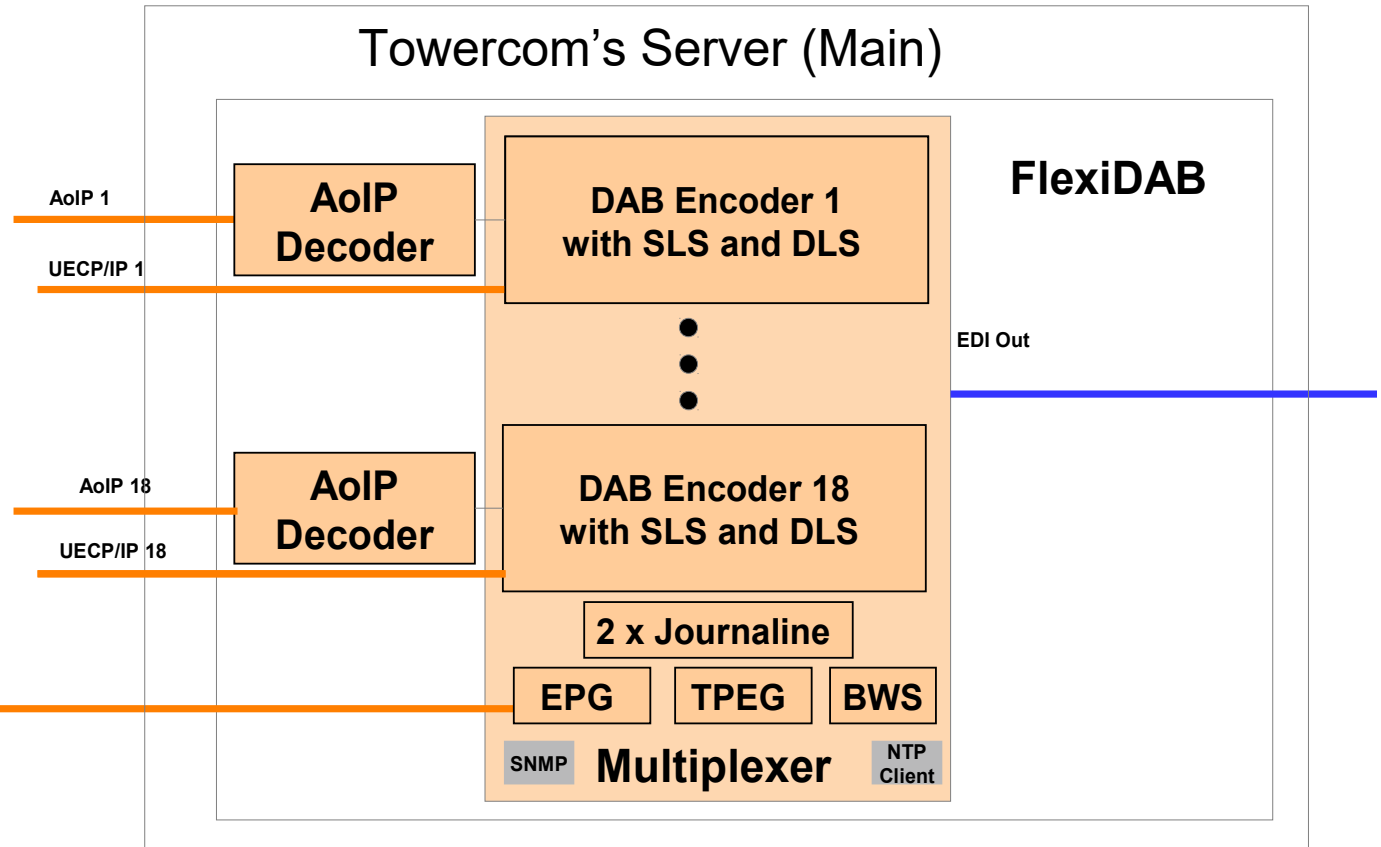
In this case it is better to have a Virtual Service Multiplexer in a centralized Ensemble Multiplexer with dedicated right management.

Standard Audio Codecs are better adapted for the audio contribution.



Examples of DIGIDIA's Realizations

Architecture Towercom (Slovakia) I



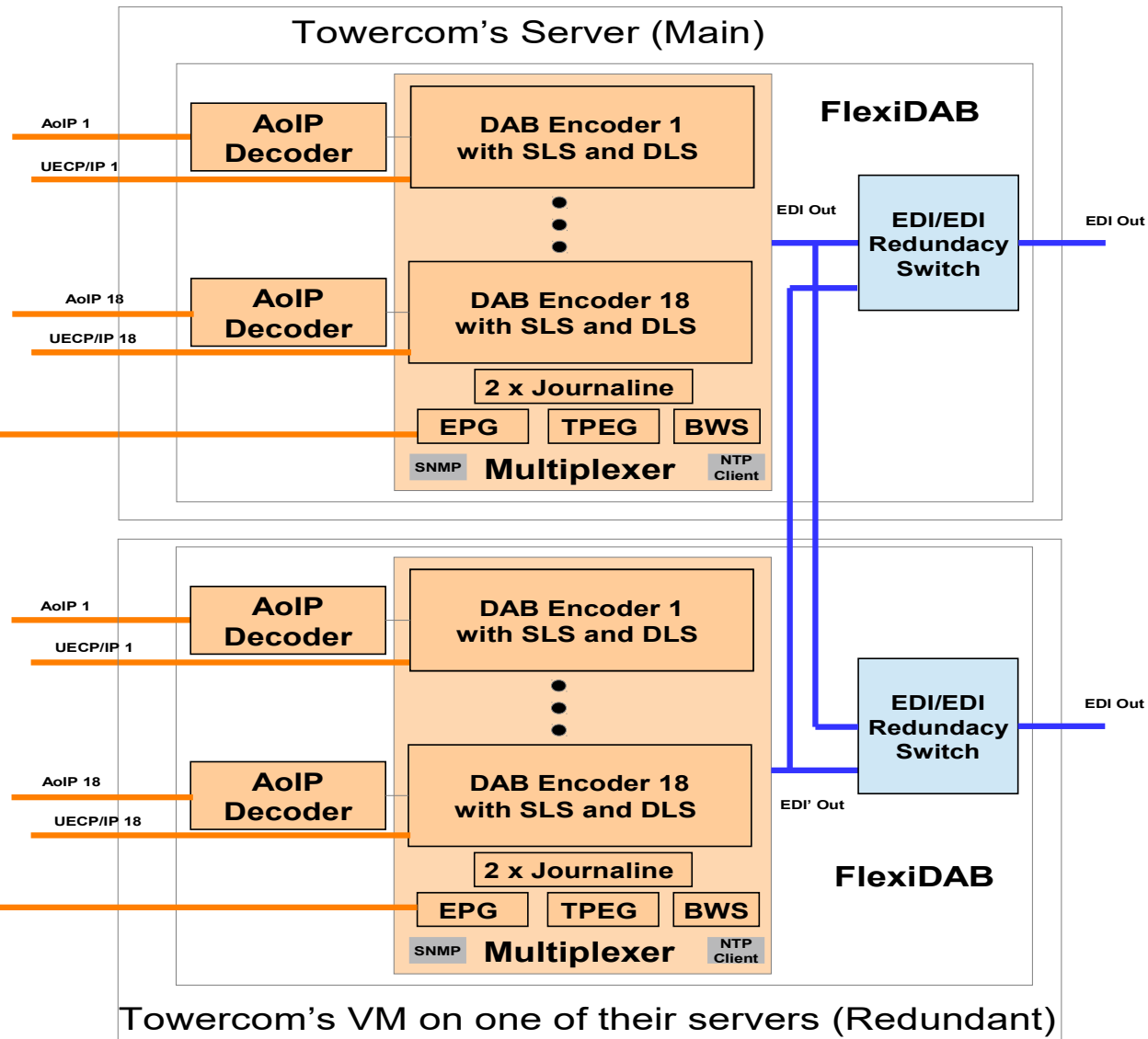
From Data Source Locations:

SLS, BWS, EPG, TPEG, Journaline

Architecture Towercom (Slovakia) II

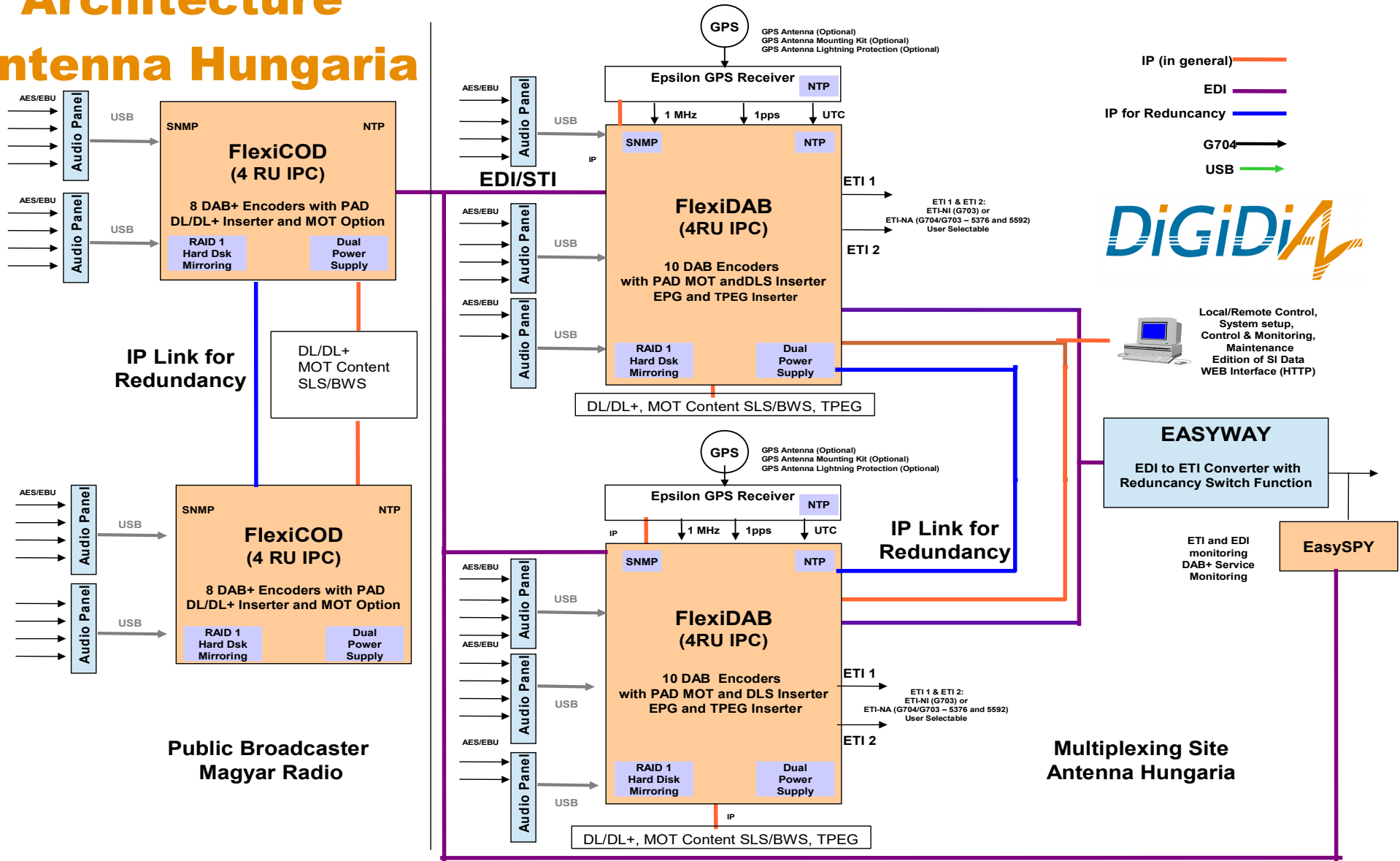
From Data Source Locations:

- SLS,
- BWS
- EPG
- TPEG
- Journaline

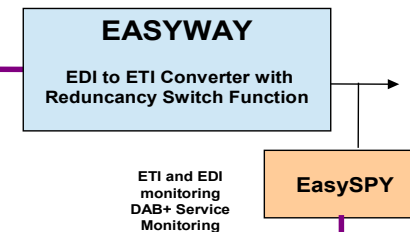


Architecture

Antenna Hungaria



Local/Remote Control,
System setup,
Control & Monitoring,
Maintenance
Edition of SI Data
WEB Interface (HTTP)



System Antenna Hungaria (Hungary)

on air since 2008, first centralized set up



5 Audio Panels for 18 Services

Master GPS Receiver

Master FlexiDAB

✓ 18 DAB+ Audio encoders

✓ 18 PAD DLS inserters

✓ 18 PAD MOT Inserter

✓ 1 EPG NPAD inserter

✓ 1 TPEG NPAD inserter

✓ 1+1 automatic redundant system

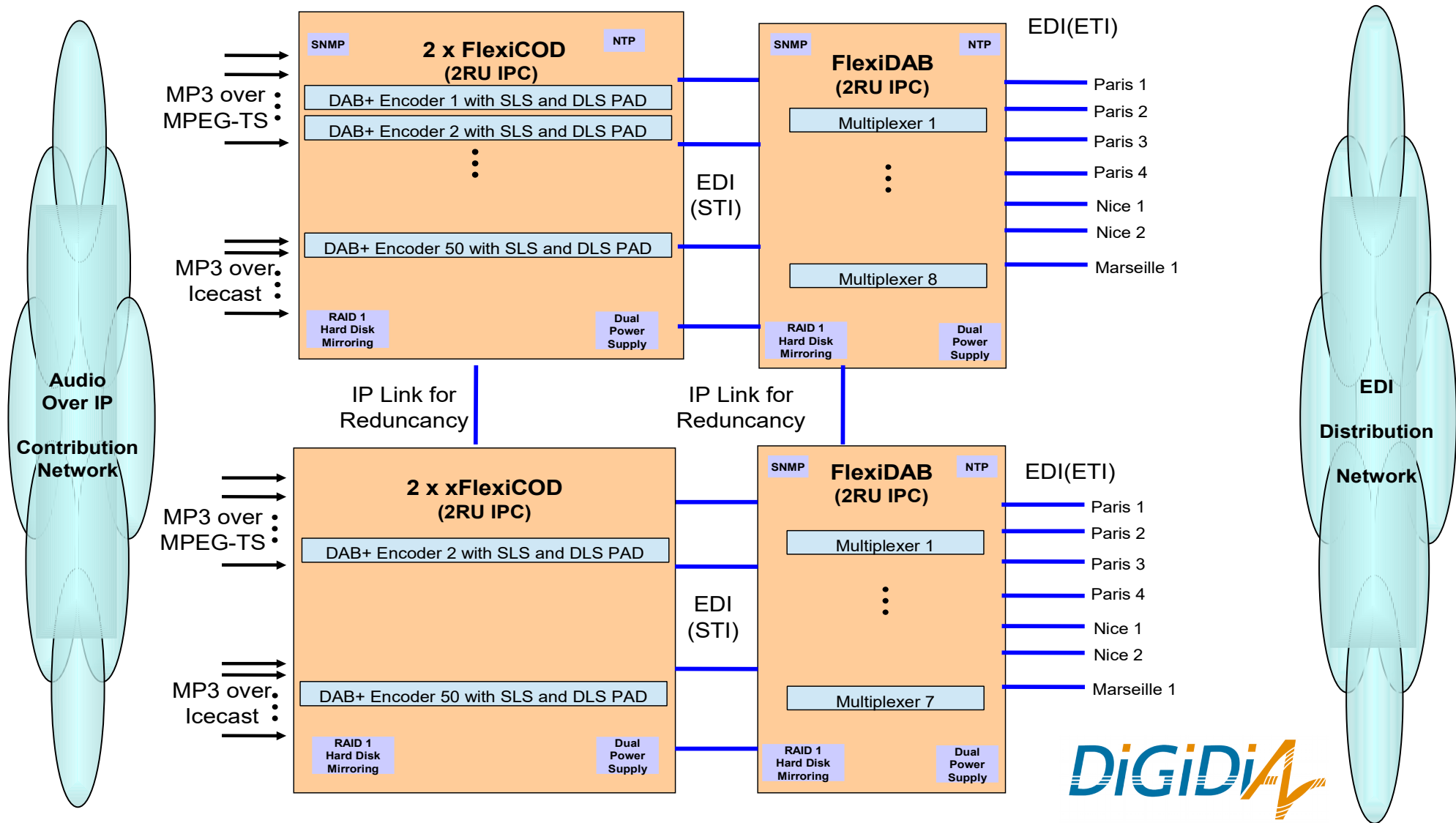
EasyWay EDI/ETI Switch (1 cold spare)

Slave FlexiDAB

Slave GPS Receiver

5 Audio Panels for 18 Services for the
Slave FlexiDAB

Architecture TdF (France)



Conclusion

Conclusion

Modern DAB head ends are completely software and IP based and therefore compact, easy to install and maintain (even remotely).

Modern contribution and distribution networks are IP based and special care has to be taken for the quality of the IP networks.

Easy virtualization or set up on customer's servers, even for complex architectures.

It is possible to start very quickly cost efficient trial systems with one (or more transmitters) on a DAB head end.

A DAB roll out is much easier today than 10 years ago.

DIGIDIA

Intelligent digital communications



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