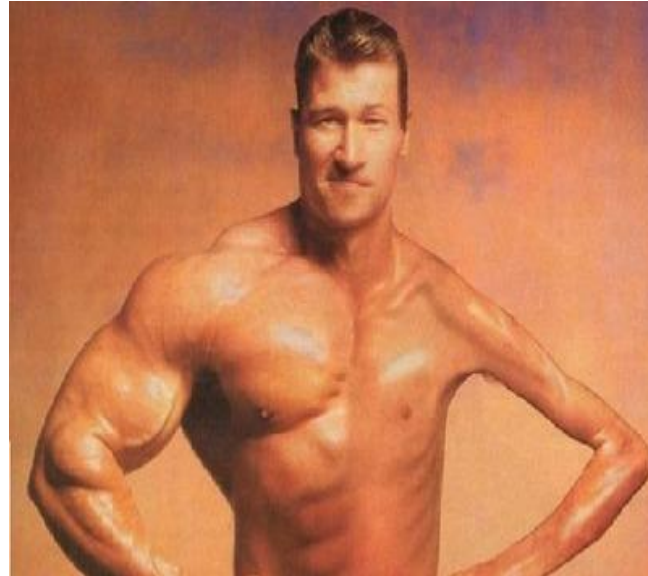


## Shift Happens

Technical and commercial  
considerations for successful  
broadcast network modernization



**Patrik Olsson**

# Agenda

- Company
- Head end
- Challenges
- Future needs
- Cloud



Founded 1986



- DAB+/DAB/DMB
- Middleware
- ETI files
- Consulting
- NICAM

FACTUM  
ELECTRONICS

#### DAB/DAB+/DMB by Factum

"A trademark for reliable, flexible and innovative digital radio solutions."

[Read more](#)



#### NICAM by Factum

"Flexible, expandable and compatible."

[Read more](#)



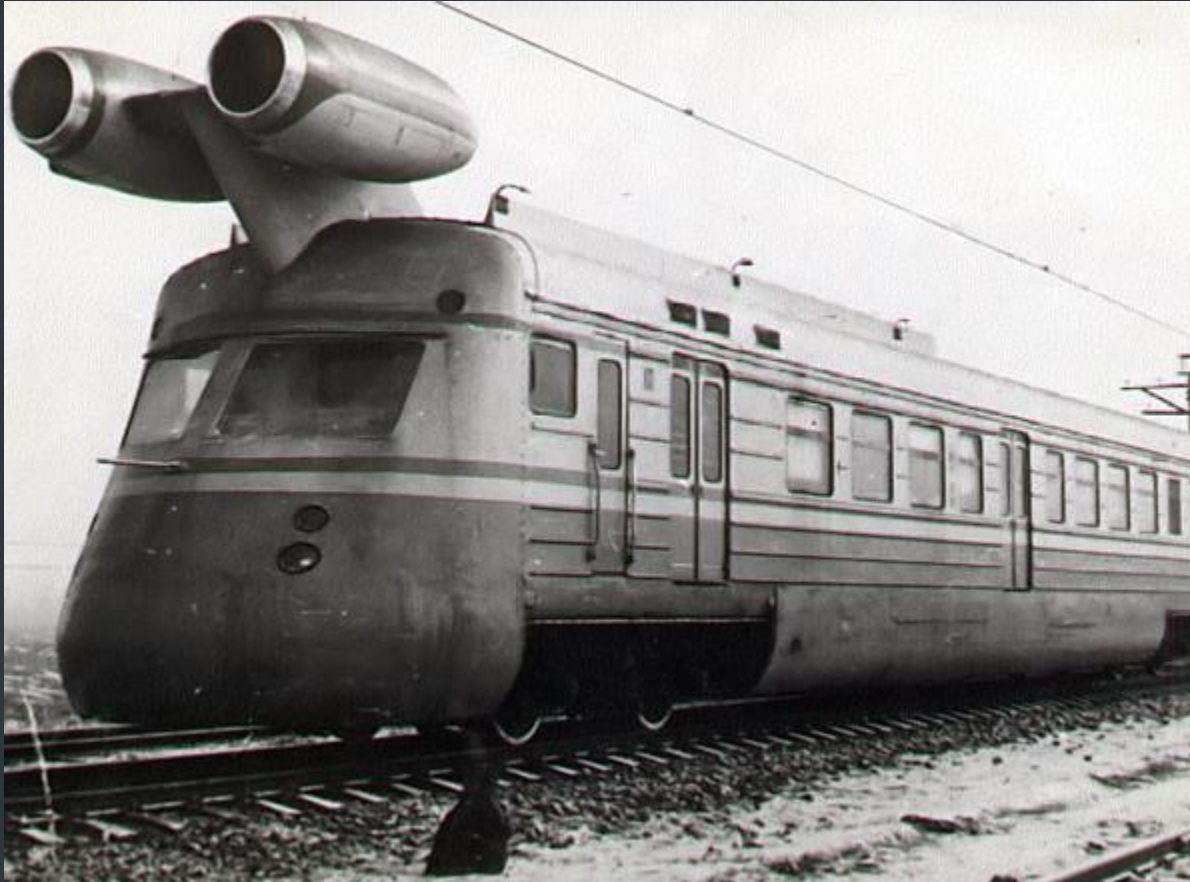
#### Middleware by Factum

"The easy-to-use API for DRM, DAB and DMB terminals"

[Read more](#)



The DAB TRAIN has left the station...



# DAB head-end- demands and challenges

- ETSI 400 301
  - ETSI 300 401
  - ETSI bla
  - ETSI etc
  - ETSI dab
- 
- Cost
- 
- Competition



# a DAB world full of technical words:

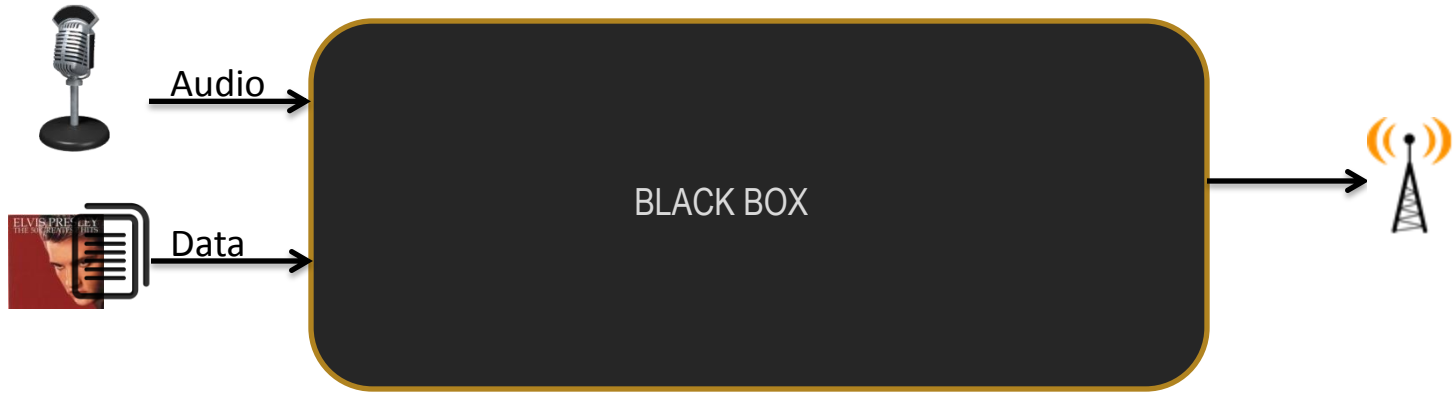
G703 FIC MOT FIG BWS  
ETI G704 PAD X27 TPEG WG1/2  
EDI STI TDC EPG  
STI-C STI-D

## As important words:

- Who will use the system?
- How to make money?
- How to offer more stations?
- How to make it easier to get started?



# DAB Head-End system



## Multiplexing

INPUTS -> MULTIPLEXING -> TX



# DAB Head-End blocks

AUDIO ENCODER

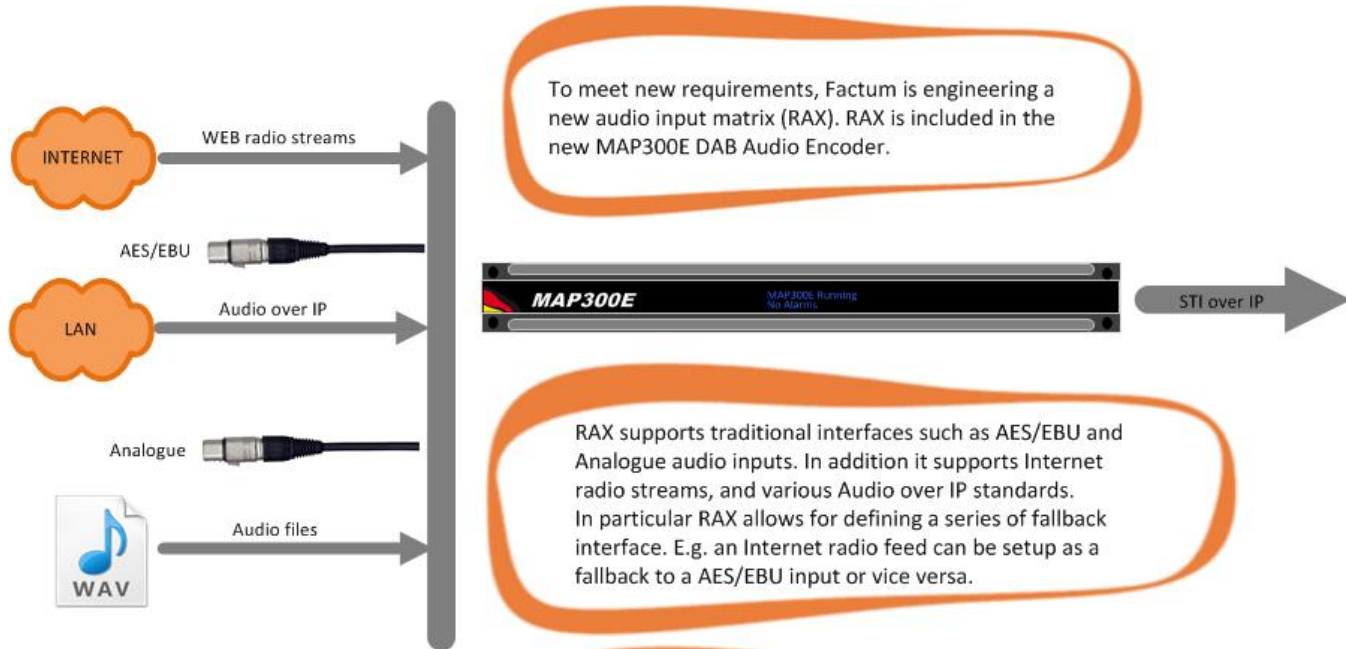
MULTIPLEXER

DATASERVER

MANAGEMENT



# Factum Encoder Audio Inputs

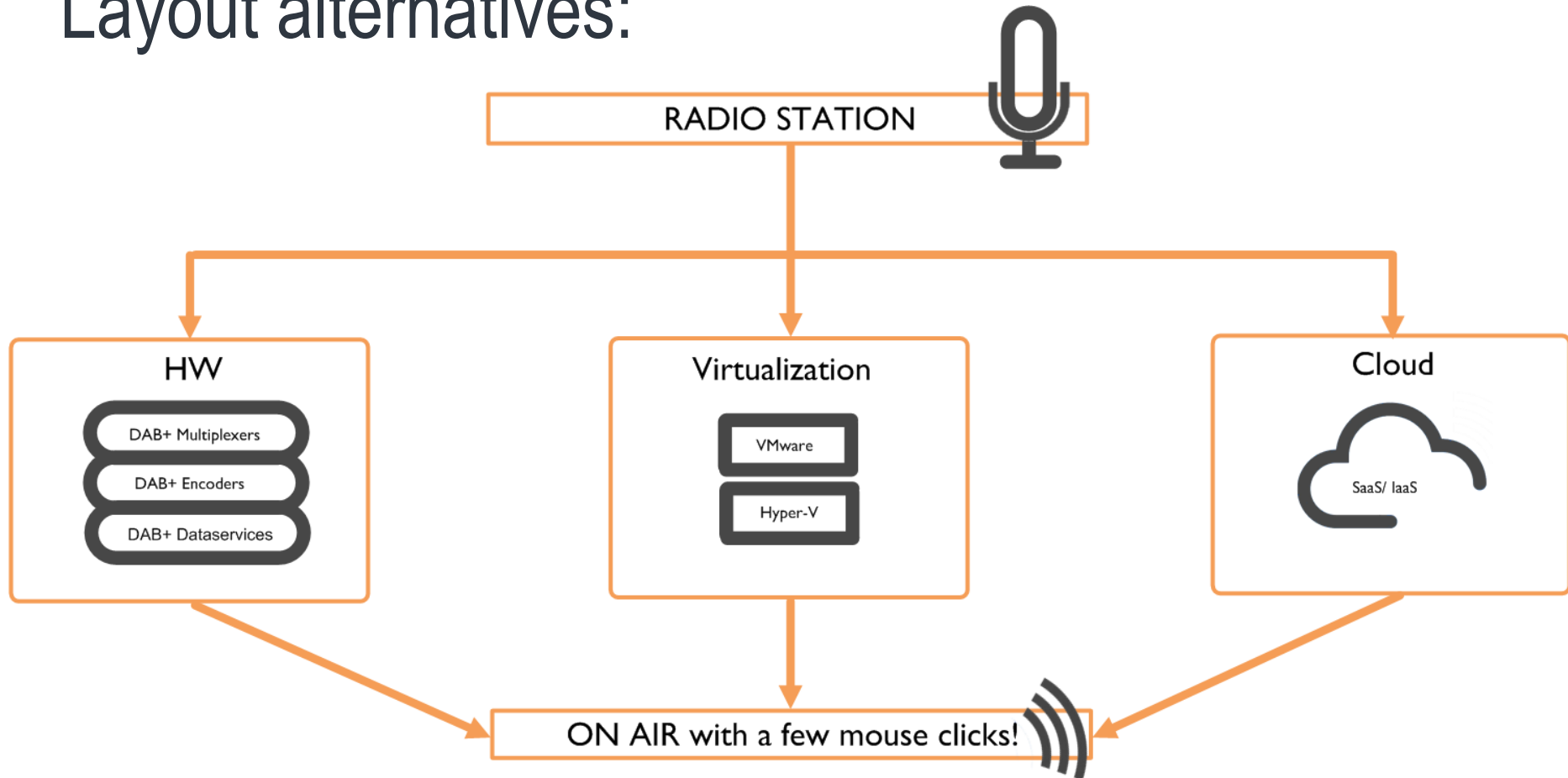


To meet new requirements, Factum is engineering a new audio input matrix (RAX). RAX is included in the new MAP300E DAB Audio Encoder.

RAX supports traditional interfaces such as AES/EBU and Analogue audio inputs. In addition it supports Internet radio streams, and various Audio over IP standards. In particular RAX allows for defining a series of fallback interface. E.g. an Internet radio feed can be setup as a fallback to a AES/EBU input or vice versa.

Another option of RAX is the ability to play out various file formats from network or local discs according to a play list. This feature allows for easy setup of a simple "jukebox like" radio station or it can be used to play interrupt messages for the on-air DAB service in case of audio input silence on on preferred feed.

# Layout alternatives:



Digital Radio has become more and more mission-critical in the most literal sense, as even a minute's downtime can reduce employee productivity, interrupt revenue-generating services, negatively affect customer service, and cause long-term damage to a company's reputation. A cloud based backup solution is a cheap insurance.

# What is DAB in the cloud?



- **Software only**

You can install the DAB system as a software in an existing virtual server platform at the operation site.

- **In the Cloud**

You could install a complete DAB head-end system as software in a datacenter, located anywhere you like, or in the Factum datacenter.

# Head end structure options:



- **Hosting**
- **De- centralized datacenter**
- **Combination**
- **Test system**

# Commercial options



- **PURCHASE**

Hardware and software acquisition, Factum to support and supervise the equipment. Support for Intel AMT.

- **SW RENTAL**

You have the server, Factum provides the SW. Monthly cost with support services over a limited period of time.

- **LEASING**

As above with a buy- out option.

- **OPEN SOURCE**

Parts of our SW is about to be “Open Sourceable”

# BENEFITS

- **PRICE**

Less hardware=Lower price

- **OPERATION**

Cost control, OPEX/ CAPEX, lower power consumption

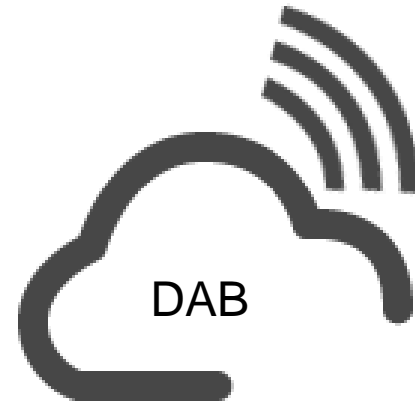
- **FLEXIBILITY & RELIABILITY**

One mouse click to start a new multiplexer

- **BACKUP**

Redundancy & common backup and maintenance strategy

- **ENVIRONMENT**



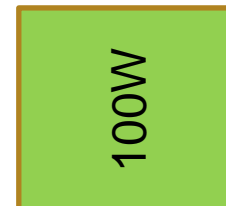


# Power consumption

BE SMART, BE GREEN



Example system  
16 services in  
dedicated hardware



Virtual Server  
Up to 30 mux systems  
in one server





# PILOT TESTS

- On-air in a test project with 4 transmitters in SFN covering 1,5 million people.
- 12 commercial radio stations participating
- Several upcoming countries about to test soon

When older equipment approaches the end of its service life, operators must decide whether to continue investing in outdated, inefficient equipment that does not meet the requirements of today's packet-based, dynamic networks, or transition to a new mode of operation that helps capture additional market share and drive higher revenue while lowering costs.

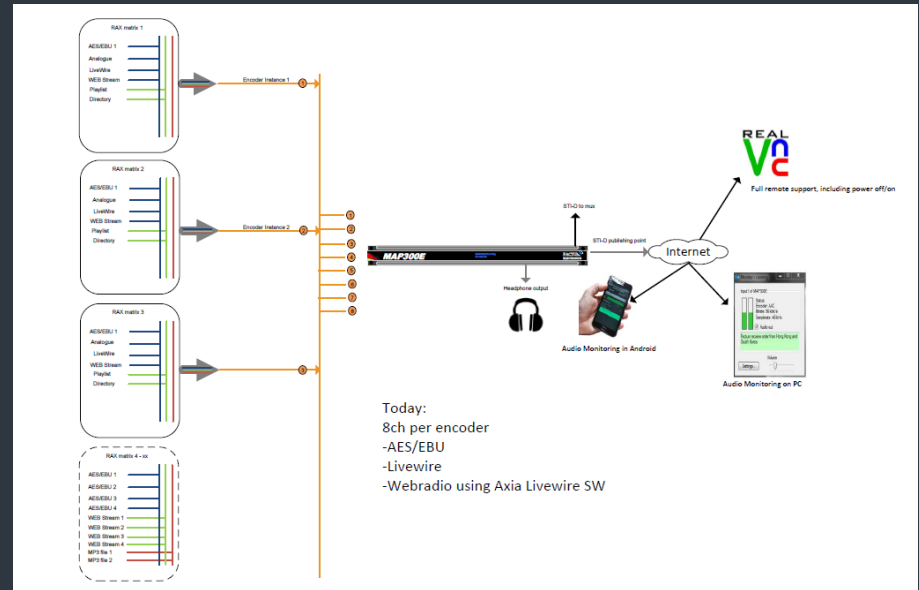
We think we help the transition to a new mode of operation by introducing virtualization and cloud based alternatives.

# Sign up for your Cloud DEMO

**FACTUM**  
ELECTRONICS



DAB- meter



Stay tuned for news on this: [www.factum.se](http://www.factum.se)

Thank you for your attention

[http://www.youtube.com/watch?  
v=XrZP0JW4kTo#t=95](http://www.youtube.com/watch?v=XrZP0JW4kTo#t=95)