Neue IP Fallstudien
Case study: tpc (Switzerland)

Orchestration and SDN control for new IP-based Broadcasting Center
Agenda

- Business objectives and benefits
- The project
- The solution
- One slide summary
About tpc

• Leading broadcast service provider in Switzerland
• Responsible for the production and technology of television, radio and multimedia for national broadcaster Schweizer Radio und Fernsehen (SRF)
Move to new News, Sports & Technology Center

November 2019

Renew technical infrastructure, based on IP

Rethink and optimize workflows
Scope of the project

INGEST
Linear or non-linear acquisition and processing
Master control room
Service monitoring

PRODUCTION
News and sports post-production
Studio production and control rooms

PLAYOUT
Channel aggregation and playout

OUT

INFRASTRUCTURE
Includes orchestration layer, broadcast IP devices and real-time network. Provides connectivity and technology for the facility.

Nevion contributes here
Key concept: **event-based workflows**
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Some **statistics**...

- 200 events per day
- 20,000+ IP endpoints
- 300+ SDN controlled devices
- 20+ different vendors
The technology...

- HD and UHD video
- NMOS IS-04/05
- SMPTE 2110-10/20/30/31/40
SDN control and orchestration

IP software defined network (SDN) based on Arista switches

Device control with automatic multicast address handling

SMPTE 2110 streams in multi-vendor environment
Key decision criteria's

“best-of-breed” approach
Pick the best available product for each part of the solution

Control of edge equipment
Pragmatic approach using mix of NMOS and device specific drivers

Multi-vendor SDN solution
Ability to support Arista, Cisco and others using the same platform

Optimum use of resources
Bandwidth management essential to avoid over-subscription

Future proof
Scalability and commitment to broadcast standards like NMOS
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Chosen network architecture

**True Spine/Leaf**

Advantages:
- Distributed with aggregation at the edge
- Less cable management
- Network redundancy
- Scalable for future growth

Challenges:
- Blocking or non-blocking depends on number of uplinks
- More complex routing
- Needs bandwidth management

Overcome by using Nevion’s VideoIPath
Software defined network (SDN)

**Ingest**
- **BFE**
  - Broadcast control

**Production**
- **BFE**
  - Broadcast control

**Playout**
- **BFE**
  - Broadcast control

**Nevion VideoIPath**

**ARISTA**
- **DCS-7020TR-48-F**
  - 48x100M/1G + 6x10G
- **DCS-7050SX3-48YC12-F**
  - 48x10G/25G + 12x100G
- **DCS-7508R**
  - 8-slot modular spine with 3pcs 36x100G modules in each

**Network Connections**
- **10GigE**
- **100GigE**

**Floors**
- 4th floor West
- 3rd floor West
- 3rd floor East
- 2nd floor West
- 1st floor Central
- Ground floor Central
- Outside TC-Building
- Basement MDC
Control architecture

Nevion VideoIPath
(Kubernetes 3-node cluster)

BFE Broadcast control

Ingest

Production

Playout

NMOS IS-04/05 & dedicated drivers

SDN control via OpenConfig

Multi-Vendor Equipment

Arista Switches

Multi-Vendor Equipment

NMOS IS-04/05 & dedicated drivers
Some of the VideoIPPath interfaces

Ingest

BFE Broadcast control

Production

BFE Broadcast control

Playout

BFE Broadcast control

Nevion VideoIPPath

Imagine Communications
IP gateways

Rohde & Schwarz
Multi-viewers

Tektronix
Measurement equipment

Stage Tec
Audio systems

Riedel Communications
Intercom systems

Pebble Beach Systems
Playout systems

Vizrt
Graphics systems

Embrionix
IP converters
Shared processing
Shared **processing** and **talent**

"With the new remote production facility, that uses the latest technology innovations and workflows, we will operate the most modern broadcast infrastructure in Finland. This will give us a boost to expand our business further."

Juha Koskela, CEO, Streamteam Nordic Oy
New international SDN project

- Spanning 10+ countries
- 100,000+ IP endpoints
- Mix of 2110 and SDI
- First live JPEG-XS deployment
New international SDN project

Country 1

Country 2

Country 3

Country 4

Country 5

Country 6

Country 7

Country X

VideoIPath
New international SDN project

HUB A
Country 1

HUB B
Country 2

IP WAN A

IP WAN B

Country 3
Country 3
Country 5
Country 6
Country 7
Country 8
Country 9
Country 10
Country ...
Country X
International virtualization enabled by JPEG-XS

VideoIPath

Country 1

Country 2

Country 3

Country x

JPEG XS

JPEG XS

JPEG XS

JPEG XS

JPEG XS

JPEG XS

JPEG XS

JPEG XS

SDI with emb. audio

SDI with emb. audio
Project Introduction

Exploring 5G and Virtualization in broadcast production
Purpose

Live Broadcast Production

Broadcasters

5G technology

Virtualization concepts

Consumers
Scalable Software Defined Network Architectures for Cooperative LIVE Media Production exploiting Virtualized Production Resources and 5G Wireless Acquisition
Participants

nevion
Mellanox
Logic
IRT
Solution

Tailor-made Software-Defined Media Network Architecture

Software for Media Network Management & Orchestration Software

SDN-based Media Servers & Media Routers (ethernet/IP Switches)
More information

http://5g-virtuosa.eu/
ARCHITECTS OF VIRTUALIZED MEDIA PRODUCTION