



Distributed Production with ST-2110 over WAN

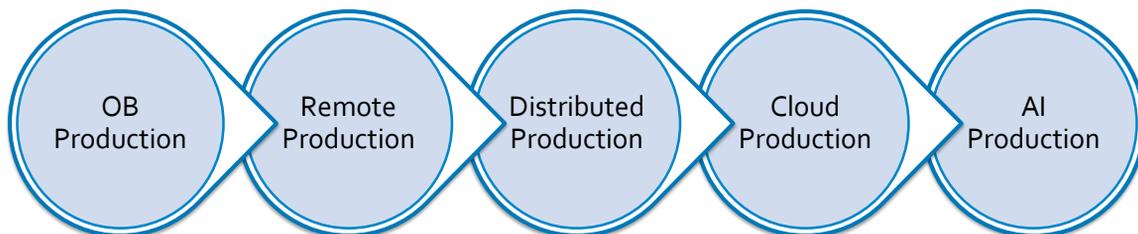
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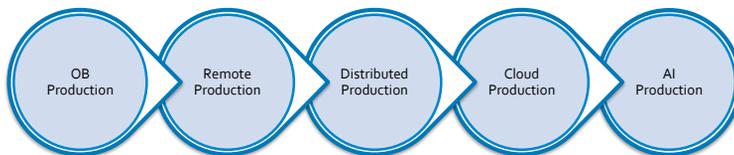
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Live Production in Transformation

Technological advancements enables efficiency improvements in live production



Requirements for Transformation



Requirements:

Requires....

Operations

Resource optimization

- Manage & optimize resources for cost optimization and business decision support

Workflow consistency

- To enable scale advantages, workflows must be consistent across geographic locations

Automation

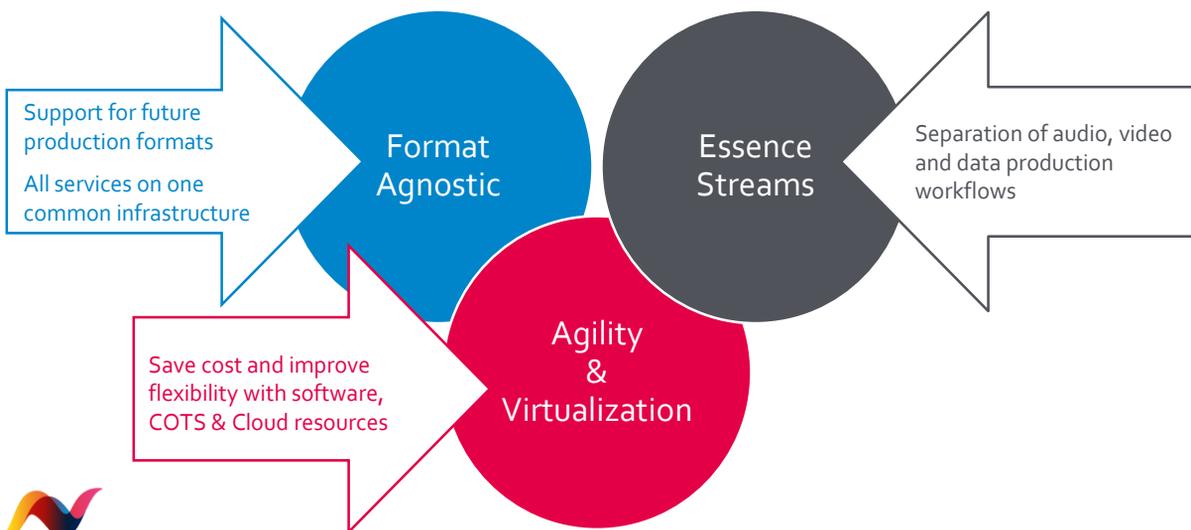
- Automation is the key to industry-level gains in production efficiency

WAN

Reliability, service flexibility, clear demarcation, domain integrity



ST-2110: A Key Enabler for Transformation



Support for future production formats
All services on one common infrastructure

Format Agnostic

Essence Streams

Separation of audio, video and data production workflows

Save cost and improve flexibility with software, COTS & Cloud resources

Agility & Virtualization



Challenges with ST-2110 over WAN

Live production requirements

Lossless transport
Strict BW guarantees
High bandwidth
Synchronization
Multicast
Low delay
Security & integrity
Workflow consistency
End-to-end control

LAN/WAN Adaptations



Well defined
service characteristics

What is offered from network
service providers

Dedicated Fiber
OTN
Ethernet VPN
IP MPLS
L3 VPN
Internet
Mobile 4G/5G



Challenges of ST-2110 over WAN

Traffic Control

Guaranteed Bandwidth

Burst Control

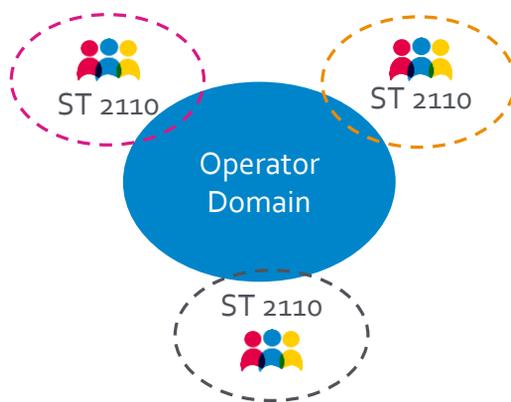
Service Isolation

Capacity Utilization



Challenges of ST-2110 over WAN

Multi-Domain Integrity



Challenges of ST-2110 over WAN

Timing & Synchronization

GPS vs Network distributed time

On-path PTP support

COTS media transport services



COTS Wide-area Network Services

Media specific requirements vs standard WAN service offerings

MEF: Clear definition of service characteristics without limiting technology and innovation



Service Type	Port Based Service	VLAN Based Service
E-Line Enhanced Point-to-point EVC UNI to UNI	EPL Ethernet Private Line	EVPL Ethernet Virtual Private Line
E-LAN New Multipoint-to-multipoint EVC UNI to UNI	EP-LAN Ethernet Private LAN	EVP-LAN Ethernet Virtual Private LAN
E-Tree New Rooted-multipoint EVC UNI to UNI	EP-Tree Ethernet Private Tree	EVP-Tree Ethernet Virtual Private Tree
E-Access New Point-to-point EVC UNI to ENNI	Access EPL Access Ethernet Private Line	Access EVPL Access Ethernet Virtual Private Line



Conclusions

The future of live production lies in the move to new distributed workflows and ST-2110 is the key enabler

To reach full potential, we emphasize the importance of running native ST-2110 essence streams end-2-end over any WAN infrastructure

For consistency, we need to adapt to service providers' existing WAN portfolio, such as MEF





Thank You

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