



# Understanding IP for Production

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Monday 17<sup>th</sup> September – 10am

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IP SHOWCASE THEATRE AT IBC – SEPT. 14-18, 2018



## Why is ST2110 so Important?

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## Why is ST2110 so Important?

SMPTE's ST2110 is the most important advance in television since John Logie Baird went head to head with EMI-Marconi in the BBC's 1936 trials at Alexandra Palace, London

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## What Problem Are We Trying to Solve?

- Distributed, reliable, real-time, point to point system for broadcasting media to viewers
- Improved workflow efficiencies
- Reduced costs

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## What is Real-Time?

The execution of data in the shortest time possible, providing near instantaneous output

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## What Does This Mean in Reality?

- Pre SDI, PAL/NTSC delay was typically less than a few fields
- SDI increased delays to at least four fields (vision mixers, frame stores, etc)
- MPEG distribution increased to at least a second
- IPTV and Radio increased delays to many seconds, usually less than a minute

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## What Are We Familiar With?

- Traditional distribution assumes the underlying network is error free (almost)
- Latencies are easily defined and usually very low
- Systems are predictable and static (relatively)

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## What is Different About IP?

- Distribution of IP packets is unreliable
- Latencies are difficult to define and do vary
- Systems self-heal and are dynamic
- Networks have their history in the banking industry and military

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## Solutions

- Broadcasting requires placing a synchronous network on to an asynchronous network
- Make delivery task based instead of time based
- Make all recorders and players timestamp synchronous

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## SMPTE ST2022

- Converts entire video and audio signal to IP packets
- Respects line, field and frame syncs
- Wasteful of bandwidth
- FEC, which consumes additional bandwidth, is required in many applications



## SMPTE ST2110

- SMPTE have abstracted away the video, audio, and metadata essence from the underlying hardware
- No longer will we be dependent on point to point dedicated connections
- No longer will we be constrained by fixed non-scalable hardware systems



## COTS

- Broadcast requires high-end Commercial-Off-The-Shelf (COTS) Products
- Enterprise grade routers/switches are at the cutting-edge of technology and are very expensive
- Expensive support contracts and spare parts are needed

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## SMPTE ST2110 Success

- Success of ST2110 is all about the fact that SMPTE have abstracted away the underlying hardware from the video, audio, and meta-data, allowing data center processing
- We can leverage technological advances from IT industries, for example - 5G

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## ST2110 Advantages

- Format agnostic – UHD-4K and 8K can be distributed over fiber channels, no need for 6G and 12G SDI
- Different formats can be simultaneously distributed over the same network and fiber
- Future proof for new formats yet to emerge

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## ST2110 Advantages

- Fast product development will be available as Software as a Service (SaaS)
- Cost of development and time-to-market for new products and services will be considerably reduced
- New pricing models will emerge

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## ST2110 Advantages

- Pay-as-you-go and pay-on-demand services
- Virtualization and cloud services
- Systems will be more dynamic

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## IP Systems Opportunities

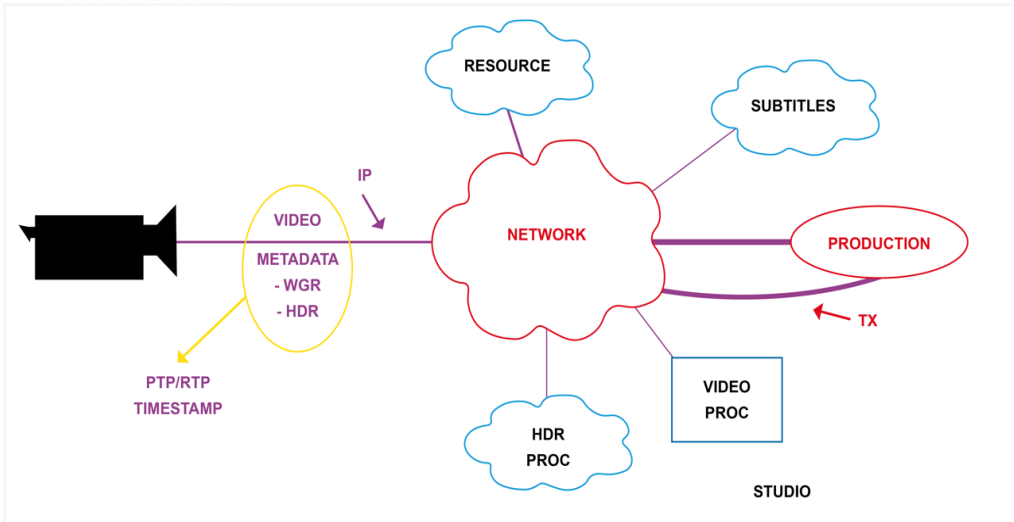
- Barriers to entry for innovators have been slashed
- Full cloud production systems now possible
- Speed with which new products and services will accelerate
- New pricing models available
- Look to telco's and IT for solutions

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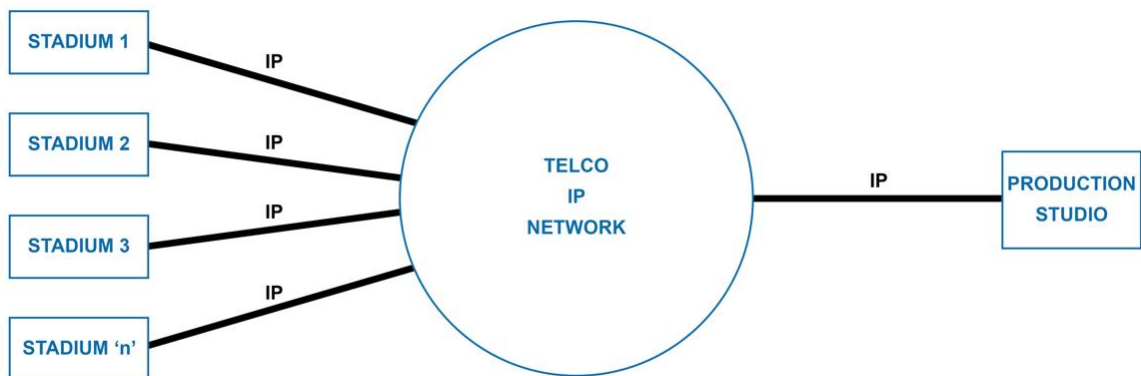
# REMI (REMOte Integration) – OB's



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# REMI (REMOte Integration) – OB's



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## Conclusion

- ST2110 has abstracted away the underlying hardware from the video, audio, and metadata essence
- IP is bi-directional and opens up a world of new possibilities
- IP provides easy connectivity to datacenters and the cloud
- Virtualization and generic networks have removed the antiquated, restrictive, hardware models of operation

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## Further Reading at The Broadcast Bridge

- Reality of IP – Part 2 – Virtualization
- Live IP Delivery – Part 1 – Real Time
- IP – The Final Frontier – Security
- IP Explored – ST2110 and ST2022
- Broadcast for IT – Why use IP?

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# Thank You Questions?

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