The (AV)olution

AV Technology Trends and Drivers

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TECHNOLOGY TRENDS
Emerging Trends

• Audio Enhancements
• Advance Future Display Technologies – Mixed Reality, VR, AR
• IoT for Smart Buildings
• Cloud Centric Management
• Artificial Intelligence
SIZE & GROWTH

The total pro-AV industry was $179 billion in 2017. This will swell to $186 billion in 2018 and then more than $229 billion in 2023, representing almost a 4.3% compound annual growth rate (CAGR) and $43 billion in additional value.
Paradigm Shift

• InfoComm International, the trade association representing the $178 billion commercial audiovisual industry, changed its name to AVIXA™, the Audiovisual and Integrated Experience Association.
What we understood

• Convergence had happened
• AV Endpoints had already transitioned to the network
• It’s now all about the network; Networked AV
• It’s all about providing an *Integrated Experiences* (IX)
What we foresee

• Niche AV players to either evolve into IT domain or become obsolete
• General connectivity, or the Internet of Things, is driving sweeping change.
• More IT Centric Companies taking on a bigger role by providing Integrated, Converged Experiences
• Clients want full control of their network
• Security is of paramount importance
• Experiences cannot be compromised

What do you see?
What we foresee

• Niche AV players to either evolve into IT domain or become obsolete
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The Technology Driver

AV OVER IP
The Caveman – AV Matrix Switches

**Fixed Sizes**
Only come in fixed sizes like 8x8, 16x16, 32x32, etc., lacking scalability and flexibility.

**Expensive**
To purchase, install, and support.

**Custom Programming**
Required for installation, modification, and maintenance.

**Proprietary components**
Requires transmitters, receivers, extenders, switchers, control processors and input/output control devices.

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Going the Way of the Dinosaur
Matrix switches don’t meet today’s AV demands – with a lack of standards, flexibility, and scalability they demand a higher cost and vendor lock-in
The AV World HAS Evolved

Video Over IP technologies have matured

- MPEG1
- MPEG2
- MPEG-4
- MJPEG
- H.264
- 4K Ultra HD
- 4K uncompressed

IP Network speeds have increased exponentially
- 10mbps
- 100mbps
- 1000mbps
- 10000mbps

IP Network equipment costs have decreased exponentially
- $$$
  Over $10,000 in 2010
- $$
  $7,999 in 2013
- $
  Over $1799 in 2017

BUT NOT EVERYTHING IS EVOLVING
Matrix switches still continue to be expensive while facing independent infrastructure requirements and scalability issues
- In 2013
  16x16
  ~$9800 + Blades
- In 2017
  16x16
  ~$8800 + Blades

You Need to Evolve With It
AV over IP Deployment
Today – AV over IP

**Scalable**
Support any size configuration with no constraints

**Cost-Effective**
Runs on Standard IP network and requires fewer components

**Controlling, Not Programing**
Easier to install, configure, and maintain and does not require specialized training

**Standards-Based**
Increased interoperability and integration options
AV over IP requires a mindset change

- Stop thinking about stand alone rooms
  - Not an effective use of AV over IP
- Think central switch linking multiple rooms
  - Delivers cost savings and true benefits
The Future is Now
The AV world is moving the way other communications industries have – leveraging IP networking to gain scale, flexibility, and affordability
# Bandwidth Considerations

<table>
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<th>AV over IP – No Upper Limit</th>
<th>HDMI 2.0 (level a)</th>
<th>4K</th>
<th>60 fps</th>
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**AV over IP Provides More Flexibility**
Future-proofing AV distribution
Available bandwidth, desired quality/resolution, and latency requirements (along with budget) influence which products are the best fit.
Network/Quality Comparison

10Gbps IP Network + Uncompressed 4k = Best Quality

1Gbps IP Network + Jpeg 2000 Compressed = Even Better Quality

1Gbps IP Network + h.264 Compressed = Good Quality
Industry Challenge

Current Networks are on 1G or 10G backbone

Most Networks are 1G but 4K requires compression on 1G

Requirement to have uncompressed 4K Signals on 1G or 10G?

On 10G, it is lossless and uncompressed
Can you imagine a world where we need systems capable of managing less bandwidth? Not a chance.

Question
Important – Sizing Network is Important

- Higher-bandwidth IP like 25, 40, or 100Gb, will be required
- Network Design is crucial
- Switches are everywhere
INTEGRATED AV/ IT ARCHITECTURE APPROACH
Network Switch – 1 Gigabit or 10 Gigabit
Network Switch – 1 Gigabit or 10 Gigabit
SDVOE – SOFTWARE DEFINED VIDEO OVER ETHERNET
What is SDVoE

The SDVoE Alliance to standardize the adoption of Ethernet to transport AV signals in professional AV environments.

Provide an ecosystem around SDVoE technology allowing software to define AV applications.

Initial members Semtech, Aquantia, Christie Digital, NETGEAR, Sony and ZeeVee.
Very Soon

• Standardize Ethernet to transport AV signals
• Unified hardware/software UI providing Integrated Experiences
• System architecture that is more flexible, reliable, and cost-effective than point-to-point connectivity and circuit switches – conventional AV
• AV Data networks sharing a SINGLE infrastructure
• Bring ecosystem partners – equipment manufacturers, software developers, chipset designers, and system integrators — together under ONE Umbrella
THE CONCLUSION
What AV Users Want

- Cost effective solutions for AV
- To avoid stranded investment in expensive AV switching platforms
- THE standard platform – Ethernet
- One platform for IT and AV
- Can be managed by IT team (true convergence)
- Ease of deployment
- Huge flexibility
- Future proofing
QUESTIONS?