CONVERGENT?

The State of AV/IT Convergence

MARK COXON

A Note About Me:

I have been in the AV and IT arena since early 2000. My first real job was at IBM Direct, followed by working for AV integrators in the residential, commercial, and then high end museum and visitor center spaces. I now work for Milestone AV Technologies as a Regional Sales Manager for Chief.

I blog for rAVe [Publications], but I have also written blogs, articles, and whitepapers for Commercial Integrator, CE Pro, and Tech Decisions.

I have been a panelist or moderator on numerous industry webinars discussing AV, its current uses and its future potential.

The observations and opinions within are mine alone and are based on my experiences over the last 14 years.

Connect with me on Twitter or LinkedIn and explore my other thoughts and opinions by clicking on the icons.

What is Convergence?

It's important to first define convergence if I am going to make any assessments as to whether it is here yet or not. There are a couple definitions, (see below), with the first one being a stricter definition of two things becoming one in the same, and the second one being a unification of two separate technologies or industries.

It has been said that the AV and IT worlds have been working toward convergence for some time now. But are AV and IT now indistinguishable from one another, or are they actually two separate entities with some bridges made between them?

I found a great little explanation of what AV/IT convergence means. It was written by Steve Thorburn, a fairly well known AV consultant in the Los Angeles area.

"Convergence seizes two different technologies that originated with different purposes, and integrates them to have a common function in a common environment."

If you'd like to see his full explanation, you can find it [here](#).

It seems from his site that Mr. Thorburn believes convergence has arrived, a view that I do not believe is accurate at this point in time. Of course, we'll talk about why shortly.

Convergence-

1- the act of converging and especially moving toward union or uniformity;

2- the merging of distinct technologies, industries, or devices into a unified whole
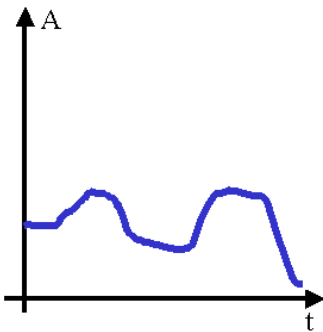
Going Digital

At one time, AV/IT convergence was merely a pipe dream. The world of AV's analog sin waves and of IT's ones and zeroes were difficult to combine to say the least.

As source material became digital however, with the introduction of CD and DVD material, convergence became more than an idea and all of a sudden had some potential.

Compression schemes like MP3, AAC, MPEG, JPEG, etc. all started opening the door to pushing AV digitally within a traditional IT ecosystem. AV devices started to integrate some traditionally IT-centric parts like hard disk drives and memory. Computer based software media players also started to become a focus of software manufacturers, giving us Windows Media Player and QuickTime to name a couple of the more popular ones we have today.
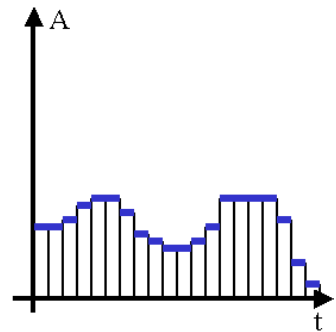
I would argue that we started to see for the first time some true overlap in hardware and software systems, but that overlap didn't equal convergence.

Analog signal –
continuously varying
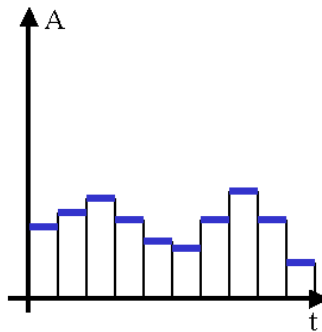
Digital signal – large
time divisions

Digital signal – small
time divisions

The Culture Problem

Getting everything out of the analog realm and into the digital world of ones and zeroes was a necessary event in the potential convergence of AV and IT, but not quite enough to make convergence a reality. There are some other things that need to be aligned in order for AV and IT to merge into one

One of those things are standards, which I will actually talk about second. The other is culture.

There are huge differences between AV and IT both in respect to how we communicate, as well as in what our goals are in system design and implementation.

In any organization or industry, for a goal to be accomplished, the people involved must speak a common language and be working toward a defined goal.

I wrote a series of blogs on communicating with IT people and later consolidated it into one longer explanation that you can find here. You need to learn the language, respect the culture, and have empathy for their concerns about AV equipment in an IT environment.

I find it quite easy to learn how to communicate but exponentially harder to learn how to make two sets of people care about the same things.

I assert that one of the major hurdles to the reality of convergence is that IT and AV people are working toward two different sets of goals.

IT has been historically focused on data integrity and security. AV has been focused on increased communication and enhanced experience.

Until there is a common goal defined by both entities, it will be very hard to reach true convergence. It is impossible to arrive at the same spot if you are traveling in different directions.

The Standards Problem

One of the reasons that AV and IT were slow to show any signs of convergence initially is directly related to the dueling standards.

Let's face it, AV and IT just refused to adopt the same methods and hardware. A prime example was the use of a 15 pin VGA connector in IT and the use of a 5 wire RGBHV coax connector in AV to transport the same signal. Just to connect a PC to a commercial grade large format display, you had to have special tools and cables or some good soldering skills.

You think that when things went to high definition, these analog lessons would have been immediately taken to heart. Instead things became a little worse. By that time the AV world had 4 ways of connecting analog signals (component, s-video, composite, and RGBHV) to IT's single DB15 VGA standard.

For HD analog signals, AV used component video and IT still used VGA. To make things even more complicated, even the color spaces were different in the two protocols, meaning that a simple conversion cable could not be used anymore, but you needed processing now to connect a PC to a component video-equipped display.

The introduction of digitally transferred signals was really the start of the move toward some type of hardware convergence. DVI ports started to appear in PCs and displays alike, finally showing some semblance of coordination in the AV and IT spaces.

We know that this protocol led to the development of HDMI later, which is now the defacto standard for HD digital transmission in PCs and in AV source equipment as well as in displays (except in broadcast which is a different story).

Today, most PCs, laptops, and displays all have either VGA or HDMI inputs and outputs and most have both while VGA is still in use (its analog sunset date is on the horizon).

Minimum Components

The question is, *"Does having the same ports on IT-based and AV-based equipment equal convergence?"*

The display and the source device are two components of an AV system, but there are a few more to consider as well.

There are 1,001 ways to build an AV/IT system depending on the type of features and functionality that is desired. That makes the AV landscape seem daunting at times. Add to that several manufacturers all promoting their own ways of accomplishing these goals and it's enough to make most people throw their hands up in the air.

All of that aside, AV/IT systems can really be broken down into a few key components- the minimum components needed to make a system.

These components are a display, speakers, source device, a way to distribute the source to the display and to the speakers, and a way to control the components of the system.

Now if you have some type of video teleconferencing (VTC) or collaboration needs, there are a few more components needed. Those components being a camera, microphone, and some type of input/output (I/O) device like a mouse, interactive pen, or touch screen.

As you can see, breaking things down this way makes systems design easier as well as gives us a great way to start evaluating whether or not AV/IT convergence is happening, or whether we are still fairly far off.

Current Methodologies

Walk into any commercial AV installation and you will see a multitude of devices and strategies to distribute audio and video.

You will see source devices and displays connected with short HDMI cables. For longer distances of HD transmission, you will see HDMI extended with send (TX) and receive (RX) boxes over category cable. Depending on the extender manufacturer, those TX/RX units could be using a proprietary protocol, HDBaseT, AVB, video over IP, or a hybrid of any of the above.

If the video is being distributed over longer distances to multiple displays, there may be an HDMI switcher, an HDBaseT switch, or an enterprise-level Ethernet switch that can pass and manage video over IP or AVB.

Then add in the fact that most of these systems still have some type of analog source components as well, and you have either a parallel network of switching and distribution or a system that takes in analog inputs and digitizes them to be sent out over the digital display connections.

And that is just for the video signals!

Sometimes the audio and control signals may accompany the video through that same network of wires, extenders, and switching and scaling hardware, but many times digital audio is being taken back to analog and fed into a traditional audio distribution system that consists of preamps, Digital Signal Processors (DSPs), and amplifiers to power speakers placed throughout the building.

Current Methodologies

Other times there may also be wireless transmission of the video and/or audio system running through the Wi-Fi network, and at times, that type of transmission may be platform-dependent, like Apple AirPlay, and not universally available to all the Android and Windows devices.

There may also be PC-based hardware and media players linked back to a server or the cloud for digital signage, room scheduling, or emergency notification.

Given the current state of the above scenarios, (and they are not even exhaustive as they do not address surveillance, access control, or HVAC), it is pretty easy to conclude that the state of convergence is shaky at best.

To determine how close we are though, let's discuss what an ideal scenario for convergence looks like.

"The second you go into an equipment closet and see an HD-BaseT video switch racked above an enterprise-level Ethernet switch, you know you do NOT have a convergent system."

The Ideal

"You're traveling through another dimension -- a dimension not only of sight and sound but of mind. A journey into a wondrous land whose boundaries are that of imagination. That's a signpost up ahead: your next stop—the Convergent Zone! "

Imagine if you will…

An array of source devices/components, displays, and peripheral devices are all connected to a network or network switch via wireless or a category cable connection.

The switch identifies each device by MAC address and stores the ideal input and output resolutions, HDCP keys, security settings, QOS priority settings, audio formats available etc.

A control system is also connected to the switch and routes control codes through the same switch over the bidirectional category cable connections.

The end user uses the control system to select the networked display he/she wants to view content on and the source device he/she wishes to access.

The switch verifies HDCP keys if needed, verifies the credentials of the user requesting the content, and maximizes the quality of that content based on the display and audio available at that device/location and the QOS settings that have been predefined in the system.

The beauty of this arrangement is that the display device could be mobile (like a tablet, smart phone, laptop), a monitor tied to a Mac or PC (or better yet the Mac/PC tower component could be in a remote rack somewhere), or a large format display.

As long as the display device has been provisioned on the network, it is addressable and content can be sent to that location.

The Ideal

In this way all AV and IT traffic could be easily controlled over enterprise level switches and wireless access points, as well as remotely over the VPN.

I want to proactively address the argument that keeping AV on a separate network is something advantageous. It is only advantageous from the AV industry's point of view, as it limits liability and simplifies our jobs.

From the customer's point of view, they want access to their data, whether from a local source or the cloud, and they want that access available at any location they choose at any time, given the receiving device is authorized to display that data.

They do not want to reconfigure ports in order to do that, or to run parallel networks. They perceive a real increase in productivity when their AV data can be managed through the network with their other endpoints. In order to create a true ubiquitous environment, we cannot fool ourselves into believing that our customers will continue to accept silos for AV and IT that create barriers to universal access at any port.

The existing Ethernet switch infrastructure is so well established and has such momentum, that it would be counter intuitive to assert that a new convergent AVIT switch standard will evolve separate from that. This is why AVB, though seemingly stalled, was at least the right type of concept for adding simplified AV management and provisioning to those devices.

I know I am not the only one with this vision. We see glimpses of it with codecs and BYOD provisioning in the VTC space, as well as with network video recorders, IP cameras, and wireless locks and strikes in the access control and security arena.

What is stopping it from going forward universally?

Hurdles

I have a good friend, Mike Dorman, who is a business coach and consultant of sorts here in Southern California. His company is called The Third Zone, which Mike defines as…

 "The area that bridges the gap between the dream of desired achievement and the reality of performance."

We are in that area now with respect to the convergence of AV and IT. We have many of the components in place to make the dream a reality, but there are still some challenges.

I talked about culture and standards earlier as two major problems standing in the way of convergence. Lets just assume for a second that HDMI 2.0 and HEVC/H.265 and H.323 cure our standards ills, and that all of a sudden AV and IT people start communicating in the same ways and working towards the exact same goals.

We would still have a few issues out there to clean up before we could really move toward convergence.

For now, I'll stick to one on the technology side: **bandwidth.**

There is a great book on the future of ubiquitous devices and universal access to personalized content at any screen location. If you haven't read it, you should pick up *Screen Futures* by Brian David Johnson.

The book is a great read and often uses pop culture references to the future of communication like in the movie *Eagle Eye*.

Hurdles

I think one of its most interesting insights is about the existing infrastructure out there for distributing content, and that a great deal of it was never built with the intent of delivering HD content on a wide scale to multiple users simultaneously.

In other words, even in today's world, we still have a bandwidth problem. That problem will affect wireless, 3G and 4G, and cloud based content dramatically. As they continue to get demand and increased traffic, ISPs will eventually have to start fortifying their infrastructure, which will start to have an effect on the price of service, and create some self - policing of content consumption along the way to keep those costs reasonable.

Another major hurdle is that we haven't all taken the time to develop the IT skillsets that are necessary to be comfortable promoting and installing things like IP based video and routing, nor have we as an industry developed the vocabulary to talk about these things on the level we need to with IT managers to assure them we can be trusted with their network.

I am not saying there are not integrators capable of it, I know a few who are, but on an industry level, not so much.

Companies like SVSi have spent a lot of time and money developing a fairly robust video over IP system that runs through a standard enterprise level switch. Yet they are being out sold exponentially by HDBaseT hardware. Why is that?

Could some of it be due to the unfamiliarity of the AV industry on whole with network topology?

How long do you think SVSi will focus on AV as its core audience without any results? It won't take them long to focus on a core IT based audience if need be. With 100x more certified professionals in IT would you blame them?

The Giants are Coming!

There has been much ado lately in the AV world about the appearance of Microsoft at InfoComm 2014. Most of that hype has been around the fact that they believe it means that AV/IT convergence is complete. I obviously disagree.

The people of Microsoft were barely at InfoComm14 but will reportedly be back next year. This will be for two reasons.

The first is that they have a product to sell in Microsoft Lync. AV and VTC appliance manufacturers like Crestron and Polycom started adding ways to leverage BYOD and moile (they are NOT the same BTW), and specifically Microsoft Lync based on the huge Office 365 user base.

The second is that they have plenty of free time and money. AV control system giant Crestron typically has huge amount of floor space at InfoComm and all that manpower to run the show, travel, and exhibit space doesn't come cheap!

No one bats an eye at the amount Crestron spends to be at InfoComm. We all know that their presence is relative to their earnings and to their opportunity to continue to grow.

Now consider that Microsoft's earnings are conservatively 150 times greater than that of Crestron and ask yourself what being at InfoComm really costs Microsoft in relative terms.

A presence at InfoComm really represents a very weak commitment of Microsoft to the AV world, if any at all and has almost nothing to do with the reality of AV/IT convergence coming to fruition on a large scale.

Microsoft @ infoComm = ???

Thoughts on Google

The other two IT centric giants often talked about in the AV space are Google and Apple.

Google recently became the [hot topic](#) of discussion when it purchased Nest thermostats for a cool 3.2 billion dollars. I see the potential implications, especially to the residential AV market, but have not quite gone into "Chicken Little" mode yet.

Google has a history of buying companies with ulterior motives in mind. Look at its purchase of Motorola Mobility.

When that happened, everyone assumed Google was going to go after the Android market directly and start producing the Google equivalent of the iPhone. However, the only thing it did with that purchase was scare Samsung back into using Android exclusively and to abandon its ideas of a proprietary Samsung OS.

I'm not sure what Google's vision for Nest is.

The company has started creeping into the consumer electronics space with Google Glass and Watch, as well as with [ChromeCast](#) (currently is the hottest 3rd party YouTube streaming device) and introduced a corporate VTC appliance in [ChromeBox](#).

The latest Google news is an [AndroidTV OS](#). That in my eyes is the most interesting development yet and may actually move the AV needle. We just need an app that allows you to create stations for digital signage.

I have a feeling though that Google sees these as incremental streams of revenue and not as the future of the company. Google at its core is a data and advertising company. It seems to have learned a little something from the aforementioned Microsoft and its near miss with IBM, in that it doesn't have to sell the hardware to rule the space.

More on Microsoft and Google

Despite its problems over time, Microsoft has been the major player in the OS world for quite sometime. Windows has dominated that market ever since IBM doubled down on OS2 (Hmmm… How did that turn out again?)

In that respect, I would say that Microsoft should be the odds-on favorite to capitalize on the opportunity for a unified OS.

However, it has failed to demonstrate that it can do this. Windows 8 seems to be its first attempt and it hasn't worked the way the company hoped. Developing tablets, phones, and PCs with the Windows 8 OS seemed to be the answer to a lot of development issues and prayers.

The reality however is that it still takes quite a bit of work to translate Windows 8 applications to Windows Phone and Surface Applications, and there are even dueling versions of Windows for Surface RT and Pro.

Microsoft has really created three to four OS products with weak links between them as opposed to a ubiquitous OS for all devices.

More on Microsoft and Google

Google has done quite a bit with the Chrome project, creating ChromeBook for cloud based computing, ChromeCast for cloud based media, and ChromeBox for meetings and VTC.

It obviously has made a much larger impact with Android for mobile devices and tablets as well, now owning more market share than Apple's iOS.

However, just like Google+ never killed Facebook or LinkedIn despite all the hype, Google has not made a solid play for the ubiquitous device OS yet either.

Maybe AndroidTV will change this.

Google's other focus is on Android for watches, so we'll see what those efforts add to the mix here.

It is yet to be seen if these behemoths can get all of their parts moving in the same directions to accomplish this goal and create a platform for standardized control across screens, platforms, and devices to control the internet of things and distribute audio and video through the combination of those devices and the cloud.

A Note on Apple

Apple is a little different story, and even I had [written in 2011 about](#) the potential of Apple to change the AV/IT landscape. (A [recent development](#) in home control supports my earlier hypothesis as well). However, even with their tight Savant partnership and their daunting portfolio of home control and automation patents, Apple has not made the move as of yet to try and dominate the AV/IT front.

They did announce [HomeKit](#), a home control app creator this year, but that was lackluster as it requires devices to use a Made for Apple standard inside their devices to be controllable. If devices do not have this, Apple seems to be betting on a third party device to control standard IR or RS-232 devices. Can't you already do this through [RTI](#) or RedEye anyway…(I just Googled [ThinkFlood](#) to provide the RedEye link and they're closed, so I guess not anymore in that case, huh?)

With the nature of its consumer-centric hardware (the acquisition of Beats Audio also illustrates this), it is hard to see Apple poised to take over commercial AV completely, although on the residential front it may have the juice to make a play.

The problem with Apple is that it has lost its captain.

Cook is a great executive but lacks the vision and innovative spirit of Jobs.
Think about Apple's product launches since Jobs passing.

It has made a smaller version of the iPad, a thinner version of the iPad, and it is about to make a bigger version of the iPad.

A Note on Apple

It has made a colored version of the iPhone5 in plastic.

Now the iPhone 6 and iPhone 6+ Phablet are out, but with incremental gains in technology, no real breakthroughs. Even the Apple wearable seems to be more of a flashy accessory than a real productivity tool.

Apple also had a shaky launch of iOS7 which many think is a step down at least stylistically from the previous version, and iOS8 reportedly totally disabled many devices upon initial installation.

I don't see Apple currently as the one company who will lead us out of our wandering in the desert between the two outposts of AV and IT.

Appliances vs. Apps

I don't think anything epitomizes the differences between AV and IT environments better than the debate of appliances vs. apps.

AV has always been an appliance-centric discipline. Need to extend component video 300 feet? Use this black box. Need to control all of your AV source and display gear? Use that black box. Need to manage multiple sources to multiple displays? Use the other black box.

In fact, after seeing its phone book of a catalog, I am convinced that Extron invented the phrase, "I've got an app for that," although I think it meant "appliance" instead of "app."

Oh, and by the way, each of those boxes is most likely proprietary, not standards based, and only compatible with the other black boxes and software that the manufacturer at hand makes, (at least until AVB and HDBaseT, which we will get to shortly).

The AV space has long utilized this array of highly specific black boxes to build systems. The advantages are reliability and protected margins. The disadvantages are proprietary code and lack of universal compatibility. I'm not making any judgment on that tradeoff. I'm just relaying the reality of the situation.

With the emergence of smart phones and tablets, with their innate control capabilities, many of these same manufacturers have had to embrace the idea of applications built for these consumer grade mobile and BYOD devices in order to continue to sell their black boxes.

Now we see more and more cloud-based options for control and source material, highly dependent on the historically IT-based PC and Mac equipment.

Appliances vs. Apps

Many of these applications are hardware agnostic and sold in a software as a service model with licenses and annual contract fees, which again is a traditionally more IT-centric revenue model.

There is a lot of resistance to these type of apps in the AV space, with many saying that [AV companies are unable to sell software](#)-based solutions and need an attached appliance in order to succeed.

The truth of the matter is that AV/IT convergence will eventually displace more and more appliance based tasks, replacing them with apps that can run agnostically across platforms and screens.

Only appliances that increase reliability or improve performance will remain, and their utility will most likely be leveraged across multiple tasks as well.

PC-Centric vs. Convergent

I want to proactively address an argument I see coming that says you can build an AV system solely with traditional IT-based equipment.

I propose that there is a difference between building a PC-centric AV system and the convergence of AV and IT.

I worked for a firm that built high-end AV systems for museums, theme parks, etc. Most of these systems did not include any traditional AV source gear.

These systems included PC-based video servers which would automatically launch files in Windows Media Player in full screen when prompted by a housekeeping computer that could wake up any PC in the system through an installed software daemon.

The same housekeeping computer would run a proprietary control software and trigger commercial

Programmable Logic Controllers, (PLCs) to control peripherals like monitors, I/O devices, etc. and even electromechanical interactives like tsunami pools or working tornadoes.

These systems also had DSPs and amplifiers as well as monitors, projectors and speakers to deliver content throughout the space.

At the end of the day, however, this isn't convergence. This is an alternate way to build a more traditional AV-centric, appliance-based system.

It also doesn't solve any of the issues discussed earlier that deal with standardization and convergence of the extension and distribution of signals from the central equipment location out to the remote monitors and speakers.

A PC-based AV system does not equal convergence any more than an Ethernet port on an AV appliance does.

Stepping Stones

Some standards based protocols like HDBaseT and AVB, as well as the emergence of video over IP, have shown that convergence is possible even if it is not here yet.

HDBaseT to me really represents an effort to avoid convergence by creating a secondary network of extenders, ports, and switches to distribute AV and Ethernet. However, there are parts of HDBaseT that are exciting.

First is that it shows that HDCP content can be transferred to a source device using an RJ45 connector and eliminate the HDMI connector. Second is it transports high fidelity audio, high definition video, and Ethernet all over a single category cable, showing that the potential for true convergence exists.

AVB shows some of that same promise, with the greater benefit of being able to be routed through a conventional enterprise-grade network switch. This shows that a secondary set of proprietary hardware, even the standards-based type like HDBaseT, is not necessary to distribute all of these signals.

Finally, video over IP also shows that HD video can be passed and extended over category cable through an enterprise network switch, even one without an AVB type endorsement.

(I have spoken with two integrators now that have seen AVB work perfectly through an existing enterprise-level switch without the formal AVB endorsement.)

If we can pass bidirectional Ethernet and HD over one cable as HDBaseT has shown, and utilize existing network switch infrastructures like AVB promises and video over IP has already done, then we can achieve convergence. . .if we want to.

Then the question really is…
"But do we?"

Follow the Money

I have spoken to quite a few people in the integration world about the idea of convergence and their thoughts on how close we are to it. That opinion always varies, but one sentiment was persistent. Most felt that the AV community was continuing to benefit from being in the intermediary state.

Let's face it: This stuff is confusing for us, it's confusing for the IT folks, and it's definitely confusing to the end user. This is a sure win for anyone selling the idea of a simplified experience.

The even bigger issue here is that traditional AV manufacturers have a lot to lose in embracing convergence.

If you look at AVB for instance, one of the biggest AV proponents was [Harman](#). This makes sense as they have little to lose in promoting a switch- and IP-based transmission method. It will sell speakers and amplifiers regardless, as those are minimum components in a system.

Other audio companies have also embraced protocol based transport of audio signals through the network switch, [the most popular being Audinate's Dante.](#)

Many appliance-based companies like Extron and Crestron embraced HDBaseT at the Valens chip level, but not in the standard implementation. These companies prefer to keep their gear proprietary if they can. Extron has started to move off this line somewhat today.

Extender companies embrace HDBaseT as it makes their extension more reliable, but if display manufacturers and source equipment manufacturers alike embrace it, like Epson is currently, the integrated HDBaseT port will take a cut of that market as well.

Follow the Money

Others that focus on HDBaseT are traditional video switcher companies, ones that would definitely have more than a little to lose if all video traffic were able to be pushed through a Cisco enterprise switch.

Coming back around to my ideal of convergence… It is ideal only from a theoretical perspective, less ideal for many manufacturers from a profit and relevance perspective.

Convergence means simplification, open access, and less intermediary hardware in the end, and with an industry like AV that has had trouble making money on software and services, that is scary.

But it's not scary to the IT folks. They know the model well.

As an industry we need to develop IT skillsets and learn how to do managed services by analyzing packets at a desk instead of rolling a truck to troubleshoot an HDBaseT extender.

We also need to understand that the CTO at a Fortune 500 does not want to make exceptions on his network for our devices, nor VLAN everything off just because we say we need it for our purposes.

He also doesn't want to allow a 3rd party control processor to talk to his network switches unless he knows the hardware manufacturer well and it is standards based.

Based on all this, what is the opportunity then for traditional AV manufacturers and integrators going forward if convergence finally happens?

The Opportunity

The hard truth is that convergence is happening but has been slow to come to fruition.

There is definitely motivation for some to stall the process and I don't see fully convergent AV/IT on the agenda of any major manufacturer, except perhaps Cisco, at least right now. This is definitely not a doomsday scenario or a reason to redo any of the five-year business plans out there.

However, if we hope to be relevant in a post-convergence environment, either as a manufacturer or as an integrator, I think we need to make sure that our businesses are geared toward one of a few things.

Our future lies in opportunities based in :

1) Minimum Components
If you are a manufacturer, make sure you are focusing on one of the minimum components required for a system: Displays, speakers, switches and wireless access points, plus peripherals like cameras, microphones, and I/O devices including touch and gesture control systems.

2) Appliances
If you manufacture appliances like HDBaseT extender boxes and switches, make sure that you are using a road map for the eventual distribution of these protocols through Ethernet switches and for the integration of these ports into source and display devices. Perhaps look at ways to enable a gigabit Ethernet switch to configure certain ports for HDBaseT distribution, just like a POE switches can do with power. Be coming up with ideas for appliances that enhance the performance of other minimum components in the system.

The Opportunity

3) The OS
One thing no one has quite tackled yet is the OS for AV systems. Control manufacturers create overlays for control and GUIs for intuitive use, but a standardized platform has not yet been developed. Think of the advantages of something like the Microsoft .Net framework, where programs are written in a similar way and then mash-up software can be created to overlay and interface with all of those other programs. That is what we need for AV.

If a company was to embark on and create an overarching protocol and OS for media distribution and control over the AV/IT landscape, it may have the new secret sauce. It would be both an expensive and lucrative venture.

It will be interesting to see how far convergence goes in the next few years and who will embrace it to its full extent. I have a feeling it will be a select few, at least in the AV space, and I am a bit concerned that IT firms may continue to get more and more of the traditional AV business based on that fact.

I was at InfoComm this year again trying to separate the InfoCommon from the innovative. I was hopeful that I would find some products on the floor that made this eBook obsolete.

Even after the show however, I have a feeling that the ideas expressed here will be relevant for at least a few more years.