

Scalable, Always-on IP Video Surveillance with Avaya Fabric Connect

How Avaya is changing the game

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Thanks for joining us today. There's a lot going on within video surveillance and how video surveillance is being done within the data networking environment.



So we're going to be talking about some of the trends in the network. I don't think anybody would argue the events that are happening almost on a weekly if not daily basis now are causing a lot of disruption within the video surveillance market, and many changes are because a lot of the events need high definition video. So there's a significant need now for IP video surveillance. And if you look at the poll results, you'll find that there's currently strong acceptance from the public for video surveillance as well.



But the problem here is that in order to get that high definition video you have to deploy IP video. Video surveillance used to be just a standalone network that was analog-based, so you had a camera plugged in via coax cable running into a DVR , - a locally recorded, fairly static environment. Now we are moving to an IP-based, high definition, very dynamic environment. Consequently, IT and the security worlds are colliding. What does that mean? The security market, depending on whatever report you read, is saying that 2014 is going to be the tipping point where IP cameras will outpace the revenue from analog-based cameras for the first time.



This is causing a major disruption within the IP video surveillance ecosystem. You have camera vendors, storage vendors, video management software vendors and, in the middle of all that, the security integrators who deploy these networks. In the past, with analog systems, the security integrators needed to know about cameras and about how to deploy them and hook them up with coax cable with DVRs. Now, though, with everything being transitioned over to IP there's a major disruption going on. The security integrators are getting stuck in the middle with having to assist on the networking side of the deployment of video surveillance when a problem occurs. Camera vendors are pointing to Video Management System vendors and everyone is pointing to the network. How do you figure it out? And vice versa.

When you see presentations depicting a network, there's always a cloud in the middle. And I'm not talking about cloud communications as far as outsourcing to a separate vendor some of your services. This cloud usually is meant to represent the connectivity between your end devices and your applications. And it's always been this big, dark hole that not too many people have actually had a lot of knowledge about except certain people in IT within your company. But for the most part, that is a big data network. And none of this works without a data network connecting everything together.



So as you're transitioning over to IP, did you know that the IP network, being right in the middle facilitating all communications from the cameras, to storage, to the Video Management System and all the viewing stations will determine how effective your system is? It doesn't matter how "state of the art" your video surveillance system is if the data network cannot accommodate it and you cannot easily deploy and manage the network.



Two worlds are starting to collide. Everything going on to IP, and IP video is the most difficult application to run on the data network. This is the Achilles' heel of data networking: very few know how to do video well on a data network. You have to be very highly credentialed to do that because it requires a low latency, high bandwidth, very resilient network, running many protocols.

What used to be a standalone analog-based video surveillance network that the CSO or the chief security officer was running now may need to be consolidated onto the IT data network where your CIO now has to worry about it. Where do you start?

If it starts off in the chief security network realm, a bunch of people who used to be able to work with analog devices now have to come up to speed on IP. Or if it has to go onto the corporate IT department's network, the CIO may not even have the skill set to handle the transition, and the CIO may not want to put the bandwidth intensive video surveillance traffic on their network because any mistake in the configuration of that could cause major outages on the network.

Is Your Network Holding you Back? Do you want to support tens of thousands of video streams but can't with your current network? Lack of scalability Do moves adds & changes require complex planning? Are link or node failures service impacting – do you have lapses in your video footage? Instability and Video loss Do you want predictable, always-on access to video streams? Are protocol overlays causing operational burden & instability? High levels of complexity Do you wish you could get rid of PIM? Are current network wide configuration practices error prone and complex? © 2013 Avaya Inc. All rights reserved. a

It's not very easy to deploy, especially if you want a highly resilient network that will accommodate growth and the ability to support multiple live video feeds using multicast. The performance of the network is critical. As you transition over to IP, you can just plug the IP-based cameras into some Power over Ethernet (POE) switches that connect together. But how scalable is that environment? It's still locally recorded and it's a very small, static installation. Not much live video being actively monitored. That's at the small end. But as you try to scale up, say you want to go from ten cameras to 50 cameras to maybe thousands of cameras, is that network that you're deploying now able to accommodate that growth? Or are you going to have to do another rip and replace in a few years time?

Next comes the stability of the video and the video loss. As you're designing the network and taking into consideration the bandwidth requirements, you also have to take into account video quality and video packet loss, and that results in a high level of complexity.

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If you look at the old way of networking (the way it's been done for the last 20 years), it was very complex and rigid and cumbersome. Anytime you needed to make a change to the network or bring up a new application, such as IP video, you had to physically change a lot of the switch configurations in the network to accommodate new VLANs or new protocols. And these changes needed to be done across the network – at the edge, distribution, and potentially the core as well That's why it's always been a big cloud on all these diagrams because it is complex

When you run video, the most efficient way sometimes is very complex and it requires additional protocols, such as PIM (Protocol Independent Multicast). If there's an outage or a misconfiguration, it takes a while for all of the protocols to "reconverge." Video does not like to reconverge, so you'll see loss of video and pixilation. The video doesn't run correctly and you may lose critical frames. It doesn't have to be like this though

There's a new way of running a network; a very simple way. As the security integrator is looking to become familiar with deploying an IP video network they have two choices: Either go the old way and learn the complex, rigid and cumbersome network technologies that require multiple protocols and a high skill set, or, use an alternative approach that takes a lot of the complexity out of the network but still provides the same, or even more functionality than what is available today That new technology is what Avaya calls Fabric Connect.

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Which would you prefer?



Networking doesn't have to be as complex as it's been in the past

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Think of a map of a busy highway system with multiple lanes of traffic and lots of complexity. If there's an accident in one lane, the rest of those lanes have to converge together. And that could take hours, or minutes. That's the same thing that happens on the data network using the old way to manage the network: multiple lanes of traffic; lots of complexity; lots of protocols.

Sometimes it's more efficient to just rip it all down and start all over again. You take all that complexity, you throw it out and then you put it back together in a more efficient way. That's what the IEEE and IETF decided to do over the last ten years with a standard called Shortest Path Bridging; it's an IEEE standard. The IEEE and the IETF standards bodies worked together and looked at the way networks have evolved over the last twenty years with protocols being layered on top of protocols such as Spanning Tree, RIP, OSPF, BGP, MPLS, PIM...etc, etc... Instead of continuing down that same path, they decided to try to reduce the complexity, while maintaining the level of services provided by these protocols now, and create a standard that will allow even more services to be added without additional complexity. The result is IEEE 802.1aq Shortest Path Bridging and the IETF RFC 6329 standards. These standards accomplish exactly what they set out to do; reduce complexity, increase flexibility, provide an efficient network that can easily accommodate virtual service overlays, such as Software Defined Networks, and remove a number of the issues that plague current networks such as loops, reconvergence, and complicated provisioning.

The Avaya Difference for IP Video Surveillance

Traditional IP Networks	Avaya Fabric Connect
Complex Multiple Protocols: Multicast is an amalgamation of protocols layered on top of each other.	Single Protocol
Slow Recovery Seconds even minutes due to multicast streams trying to re-establish while the network protocols (OSPF & Spanning Tree) are trying to restore n/w	Lightning Fast Recovery Sub-second recovery <200 ms due to single protocol
Limited Scale 100's of streams	Massive Scaling Tens of thousands of streams
Painful to deploy PIM enabled on all routers, rendezvous points, etc	Ease of Configuration Edge provisioning only- no need to touch core
Erratic Performance When a network event occurs, CPU spikes due to multicast session initiation; sessions may drop	Predictable Performance Eliminates CPU spikes
Security Vulnerable Limited end to end separation	Secure Traffic Separation Totally private and closed network

This represents a new way of doing networking. You have the same functionality, but it's like using a "simple button" for networking.

Avaya Fabric Connect is simple. Multiple protocols are slimmed down to one. Before, you had to learn each protocol. So you needed another class, another certification. But with only one protocol on Avaya Fabric Connect, in the case of a network outage, recovery time is subsecond as opposed to potentially minutes on current network infrastructures. On an Avaya Fabric Connect network, or any vendor's equipment running Shortest Path Bridging, this recovery happens in a sub second time frame because you don't have all those different protocols that need to talk to each other. If you have a failure in portions of the network, Avaya Fabric Connect will come up very quickly with very little pixilation. You maintain the connection, the video reliably reaches storage and the video monitoring stations, and the Video Surveillance network runs as designed.

Anybody who understands and deploys data networks understand the complexities that exist on the data network right now. Basically what this new generation of data networking provides is the ability to accomplish the same functionality currently provided on the data network, provide a base platform that is streamlined so that new functionality can be easily deployed, all at a fraction of the manpower currently needed.

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Whether you have a very small network or a large network; whether you're transitioning over from analog through encoders (so part of your network is on an encoder base while the rest of it is IP traffic directly connected to a switch); whether it's standalone or integrated with the full IT infrastructure, your transition has to address all configurations and, with those constructs, all the performance capabilities.



Here are a couple of use cases that show you exactly what we've done for some of our customers, just to show you how it works.

The county of Santa Clara encompasses a large metropolitan area, and they have about 430 cameras out on the highways. They were running the network in the old way, and they were constantly having problems. Every morning they lost connection with the cameras and had a hard time getting consistent feeds displaying on their monitors when they dynamically needed to focus on a traffic situation. With our solution, we didn't have to replace the whole network. This is key; this is not a "rip and replace solution."

We came in and took out just one switch in the core of the network. We turned off all of those protocols that I discussed earlier, primarily PIM, and just turned on shortest path bridging (SPB), which is the basis of Avaya Fabric Connect. The result is they now have consistent video streams from all cameras, and they are now able to populate the monitoring screens at will without any issues. Just by taking a little portion of the network and replacing it with a less complex technology! The county is saying that the traffic is running better than it ever has, and they are now able to manage their roads better because they are now receiving consistent, reliable data.



Another example we have is in gaming. The gaming vertical is probably one of the most taxing environments out there for video surveillance. In this case, a 4,000 camera environment was working on a separate network, so it wasn't even contending with other data traffic. But it just wasn't working correctly. Once again, we were able to resolve their problems, with a network that scales with thousands of cameras.





This approach is not just for video surveillance. The use cases that I've talked about so far use video surveillance, which is a very taxing environment for data networking. If you can solve the Achilles' heel of data networking, you can solve most of the other problems that are in the network.



InteropNet is one of the largest data networking conferences in the industry. It runs twice a year in May and in September. It is also a very dynamic environment with services being brought up and down constantly. Every year the show staff picks a vendor to run the network that connects all the other vendors together.

Our three engineers had the whole network up and running within a couple of days. The director of the show was so impressed that he did something he rarely does; he gave a quote to the *Wall Street Journal* and *Network Computing* that he was just blown away by the capabilities of the Avaya Fabric Connect network, saying that it met the challenges without a single incident.



One of the most complex data networks running will be for the Sochi Olympics coming up next year. And our track record is why we have been the official provider to supply the network, voice and data.

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Is Your Network Ready?

An IP Video Surveillance
System is only as effective as the
IP network it runs over

You need to understand the changes going on in the data networking market

 The Next Decision Phase is starting now

Why IP? to Which IP? to Which IP network?



Avaya Fabric Connect The Networking Choice For IP Video Surveillance

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So is your network ready? An IP video surveillance system is really only as effective as the network it's running over. You do need to understand the changes going on in the data networking industry. As you make that transition from analog to IP, you have to decide what IP networking solution you want to deploy. Your goals should be to deploy a network that makes it easy to provide a scalable and simple solution for making transition from analog to IP with a solution that can handle all of your needs now and in the future.

The next decision phase is starting now. The video Surveillance industry went from "Why IP", to "What IP Cameras" over the last few years. Some of you have already migrated to IP and some are in the process. But the next decision is what IP network? Do you want to do it in the simple way or go down the path of the very traditional complex way?



The goal here has been to show you a little bit about what we're doing in the industry. It is a prime market for the convergence of these two technologies. And we believe that Avaya Fabric Connect is the best networking choice for IP video surveillance because we've been able to take that complexity out of the network. For more please look under the topic of video surveillance at avaya.com.

