



ENCOUNTERS OF THE HD4K KIND

With television manufacturers continually coming out with new products to meet the ever-increasing demands of consumers for the “latest and greatest” technology features, pressures continue to mount on network service providers (NSPs) to be sure their networks can keep up with the ever-increasing bandwidth demand.

One of the most recent advances in the television industry is HD4K TV. As the term implies, HD4K TV is about four times as high-definition as regular HD TV.

It is expected that there will be a slow ramp-up of 4K technology beginning in 2015, with massive deployment following in 2016 and 2017.

While all providers (satellite, cable and telco) will be impacted by the introduction of HD4K, in that they will need to improve their abilities to meet the ever-increasing bandwidth requirements, the impact will certainly be the greatest on telcos, especially those that rely on copper networks, rather than on fiber networks.

“HD4K will have a major impact on the network, especially the copper network,” said Steven Senne, P.E., chief technology officer for Finley Engineering. “On the one hand, HD4K is a great opportunity. On the other hand, it is going to signal the death of a lot of the longer copper loops.” The reason is that HD4K will require having to get 20 to 30 megabits per second (Mbps) out to the customer, which means that the loops will need to come down to the 3,000 and 4,000 foot range maximum.

WHAT OPTIONS DO TELCOS HAVE? AS SENNE SEES IT, THERE ARE THREE.

One option is not to support bandwidth requirements for HD4K at all, which is the situation with most service providers today. While providers in densely-populated urban areas will likely feel a lot of pressure to be able to provide the additional bandwidth in the next year or two, other providers may not feel as much demand. “If you live in a rural area, and the provider isn’t interested in upgrading you, then you get what you get,” said Senne.

A second option for providers is to subdivide the existing carrier service areas down to smaller areas that would support new HD4K-compatible

technologies, such as VDSL2 or G.fast. That is, providers can upgrade their technology from ADSL (asymmetric digital subscriber line) to VDSL2 (very high speed digital subscriber line - 2), or to the G.fast standard that many vendors are talking about.

VDSL2 is an access technology that exploits the existing infrastructure of copper wires that were originally deployed for traditional telephone service as a way to deliver very high-speed internet access. The main high-speed link terminates at a hub near the customer’s location. The existing copper wire infrastructure is then used to carry the high-speed connection for the short remaining distance to the customer. It can be deployed from central offices, from fiber-optic-connected cabinets near the customer premises, or within buildings.

G.fast is a transmission technology that uses a wide frequency band to achieve very high speeds on copper lines over very short distances.

“One problem with these solutions is that the large number of small nodes that will need to be deployed is going to be a cost-prohibitive challenge for providers,” said Senne.

The third option for the provider is to move toward a whole network of fiber.

Finley Engineering can help NSPs evaluate their networks and then evaluate their alternatives for upgrading their networks. “We can also help them evaluate their existing equipment core to see whether or not they will have the ability to support the bandwidth,” said Senne. “In addition, we can also help them with their backbone upgrades.”

If and when NSPs achieve sufficient bandwidth to address the needs of HD4K, are their challenges over? Not by a long shot. “HD8K is the next generation of the high definition standard,” said Senne. “Vendors are estimating that this will be available around 2020. The challenge with an 8K solution is that it takes 16 times the bandwidth of what video takes today, meaning you have to provide 100 Mbps or more to support that.”

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