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Four Emerging Networking Technologies

Intel sees a need for new solutions

By Mark LaPedus

The soaring demand for voice and data traffic is choking the network.

Mobile video, social networking, games and other applications are just some of the technologies that are causing a bottleneck in the network. And the problems are expected to get worse. For example, mobile video is expected to increase from 52% of all network traffic to 90% by 2018, according to Jeni Panhorst, product line manager in the Communications Infrastructure Division at Intel Corp.

"This is just the beginning," Panhorst said. "The question is can we build a network that can keep pace?"

During a presentation at this week's AdvancedTCA Summit in Santa Clara, Calif., Panhorst said there is a pressing need for new solutions to solve the bandwidth bottleneck. AdvancedTCA Summit was sponsored by Extension Media and others. Extension Media is the publisher of Chip Design.

There is also an increasing gap between the growth of Internet traffic and the lack of revenues being generated by carriers and operators. Here are some current and futuristic solutions to solve the problems based on her presentation:

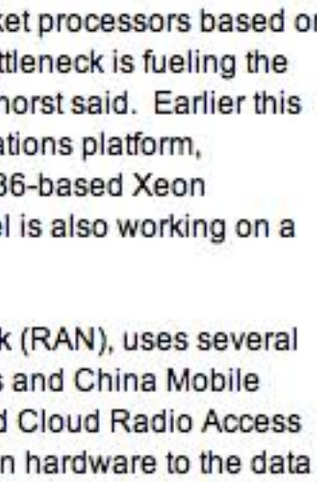
1. Software-defined networking (SDN). This is a concept that changes the way network traffic is managed. In today's routers and switches, the fast packet forwarding (data path) and the high level routing decisions (control path) occur on the same device. In SDN, the data and control path are separated. The data path portion still resides on the switch. High-level routing decisions are moved to a separate controller, typically a server. Bypassing the traditional traffic-management rules - especially within datacenters - gives carriers more flexibility by providing the ability to choose and change network traffic routing. The result is an increased ability to introduce new services and to adapt the network faster when service changes are required. Facebook, Google, IBM and many others are working on an SDN standard called OpenFlow, which is still in R&D. Meanwhile, Verizon - in collaboration with Adara Networks, HP and Intel - are working on OpenFlow. "OpenFlow is a good start," Panhorst said. "It's not the total answer," but "this is an opportunity to build out the virtualized network."

2. Faster communications chips. Each minute of the day, 30 hours of video is uploaded across the network, according to Intel. As these numbers continue to climb, the burden will be on equipment manufacturers and service providers. For some time, Broadcom, Cavium, Freescale and others have separately developed packet processors based on MIPS and other architectures. Going forward, the bandwidth bottleneck is fueling the need for a new class of devices to address the data plane, Panhorst said. Earlier this year, Intel disclosed the company's next-generation communications platform, codenamed "Crystal Forest." The platform, which includes an x86-based Xeon processor, is aimed to boost packet processing. In addition, Intel is also working on a device with 40-gigabit-per-second capabilities.

3. C-RAN. Traditional cellular networks, or radio access network (RAN), uses several base stations. Each base station covers a small area. Intel Labs and China Mobile Research Institute in Beijing are working on a technology called Cloud Radio Access Network (C-RAN). Instead of moving the proprietary base station hardware to the data center, it is replaced by standard x86-based servers running a software-defined radio application. C-RAN technology promises to reduce both capital and operational expenses for wireless service providers, while providing better levels of wireless services to users with fewer dropped connections during periods of peak demand.

4. Scalable Media Transcoding. There are a bevy of digital media formats. Video transcoding converts one signal representation of a given video to another. Many formats can be encoded or transcoded faster than real time. But in many cases, conversion times remain slow. Look for technologies that will handle 1080p and other formats at 20-megabits-per-second, Panhorst added.

Mark LaPedus has covered the semiconductor industry since 1986, including five years in Asia when he was based in Taiwan. He has held senior editorial positions at Electronic News, EBN and Silicon Strategies. In Asia, he was a contributing writer for Byte Magazine. Most recently, he worked as the semiconductor editor at EE Times.



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