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Privacy, piracy and deep packet inspection

By Carol Wilson

The controversy that has blossomed over Comcast's use of deep packet inspection (DPI) technology to rate-shape peer-to-peer traffic comes at an awkward time in DPI's life cycle. Just as the Internet world is getting its knickers in a twist at the thought of an ISP examining and controlling traffic based on specific applications, DPI technology is poised to allow service providers to do much more, particularly when it comes to offering premium services, greater security and even perhaps protection from piracy of video content.

Initially deployed by service providers to directly address the flood of P2P traffic, advances in DPI technology and in the power of the systems developed to inspect individual packets even as bandwidth is booming has positioned this technology as potentially critical to service providers wanting to move up the value chain and avoid becoming "dump pipes."

"All of the major vendors are coming out with the next generation of their products and pushing the message to the market that it's moving more toward service control and customization of the network as opposed to just monitoring the network," said Yankee Group Analyst David Vorhous, co-author with Mark Bieberich of a new report (http://telephonyonline.com/broadband/technology/dpi_allot_yankee_102207/index.html) which included the development of a tool for calculating the return on investment of deploying DPI to create a tiered services platform.

At its most fundamental, DPI would enable service providers to establish tiered services – the classic platinum, gold and silver model – and prioritize traffic by the packet, depending on what the subscriber has paid for. It is also possible, however, to prioritize based on application – giving a video service packet greater priority over a data service packet, for instance, to preserve the integrity of the video product during periods of network congestion.

There are multiple reasons for wanting to do this. Most obviously, if customers are willing to pay more for a better quality of service, that puts more revenue in the pocket of the service provider and could stop the downward spiral of bandwidth prices.

"Today you see more and more that DPI can be used for a quality of service function that will enable new services, prioritize services, generate more revenues, increase the number of users, produce better service and a reputation for better services that reduces churn," said Azi Ronen, executive vice president of Allot Communications, a DPI technology company. "This should make things better for everyone."

Some customers will be more than willing to pay more – online gamers are the most frequently cited market, as they look for any advantage over the competition. But telecommuters and businesses with distributed facilities are also targets for a tiered service.

"All of the network operators are interested in finding ways to not be commoditized as a dumb pipe," said Mike Coward, chief technology officer of Continuous Computing. "They are all interested in enhanced services. Google has popularized the model of taking customer information and leveraging that for economic gain. Consumers have been comfortable with that, within some parameters."

By identifying which customers are avid gamers, for example, "a service provider could market to them, offering enhanced bandwidth and lower latency," Coward said. "For VoIP services, they can offer enhanced call security."

The danger, said Matt Davis, an analyst with IDC, is if service providers use their knowledge of traffic types to give them an unfair market advantage or to discriminate against some consumers.

"If they begin to focus on one particular peer-to-peer group and not apply the policies across all peer-to-peer traffic, that's a problem," he said. "The more control you get over the network, the more potential for preferential treatment – but I don't think they are going to do that."

The argument can also be made that DPI can be used to improve overall customer satisfaction, both by making sure low-priority traffic such as P2P doesn't disrupt network services to other users, and also identifying malicious traffic, such as botnets, and helping to reduce it.

"In the past, there were relatively crude tools available to identify traffic and policies that may have been applied in the past may have been unintentionally heavy-handed," said Tom Donnelly, executive vice president of Sandvine. "For example, traffic on one port might be identified as problematic, so all traffic on that port is blocked or shaped. What's happened with DPI is that it has evolved to give a more accurate view of what is going on. Most of our customers simply want to give the greatest good for the greatest number of users."

DPI is good at "identifying conditions or applications which have evasive characteristics," he added. "It uses quite complex analysis to make accurate identification of what is happening."

The problem, of course, is that the Internet community is not at all comfortable with the idea that ISPs, particularly the large cable and telecom operators who own the networks, are the ones being allowed to set the priorities and determine whose traffic gets the right-of-way. The Net Neutrality movement in the U.S. has equated the notion of tiered services with discrimination against all non-premium traffic and continues to push for legislation that would outlaw such offerings.

The Net Neutrality push could slow use of DPI to offer tiered services in the U.S., said analyst Vorhous, but it is not likely to have the same impact overseas. Because of their concerns about the Internet community's reaction to use of DPI, however, service providers are keeping a low profile on the technology, often declining to admit its use or give details.

"Service providers are reluctant to talk about what they are doing," he said. "There are large service providers that are using the technology right now in the U.S. or have active RFPs out there in the vendor community. Those don't become public. Because of Net Neutrality concerns, that it is such a PR issue in the U.S. that they are very hesitant to talk about what they are doing. It also makes them a little bit more hesitant to embrace the service control we are talking about.

"We've had candid conversations with others who are willing to say they are using it and willing to talk about how they are using it, just because Net Neutrality is less of a concern in other countries," he added. "I had a great conversation with a large provider in Australia, and when I asked if they were concerned about making public the knowledge you use, their response was, 'That's an American concern for Americans.'"

As video becomes more important in the Internet realm, however, it is likely the DPI will be used to assure quality, and as the need for security remains high, the technology's ability to detect malicious traffic will remain critical.

Coming next: DPI as a tool of detection for video pirates

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