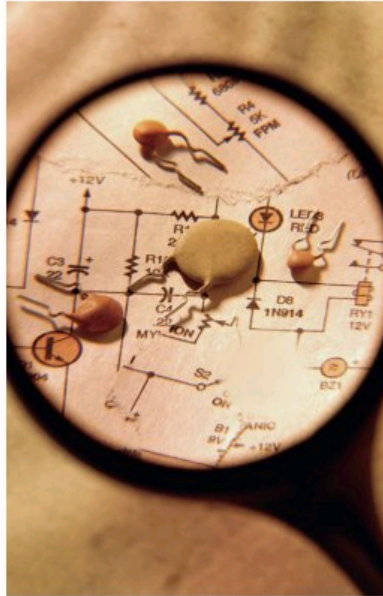


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type video snippets—involving bandwidth from 128 kbps to perhaps 768 kbps. The range reflects the fact that there are a hodgepodge of different formats for encoding and transmission, which include, for example, DVB-H, DAB-IP, S-DMB, MediaFLO, and others.

The many different flavors of this class of video traffic type also makes tracking it—let alone rating the quality of individual video transmissions—very difficult. And some vendors confide that they don't see a big market demand for it anyway.

Where test and measurement vendors do see rosier business prospects is in tracking and quality measurement of broadcast video and video on demand (VoD)—services that carriers and service providers are clamoring to rush out the door. There are some standards in this traffic sector, MPEG-2 and MPEG-2 TS, which are giving way to the more bandwidth-efficient MPEG-4. Both MPEGs support “standard-definition” (SD) and high-definition (HD) transmission, with



HD consuming two to three times the bandwidth of SD.

“We target the most high-value video content our customers have, namely

broadcast and on-demand video,” says Laura Holly, Director of Video Service Assurance with Brix Networks. “In our target market there is currently less concern about the quality of videoconferencing, CC [closed-circuit, typically security] video, gaming, or other video-based applications,” she adds.

Clearly, bi-directional videoconferencing is of secondary stature. There is more growth seen in laptop/desktop and personal videoconferencing than in high-end, “studio-quality” videoconferencing, the respondents indicate. These are dramatically different in bandwidth, with “personal” videoconferencing using appreciably less than 1 Mbps per stream, while studio quality requires multi-megabits.

But one significant video-related traffic type didn't make the chart—video file downloads. These files are DVD images and the like, of both authorized and, increasingly, bootlegged video content. And they are huge—in most cases multi-gigabytes. It has been estimated that as much as one-third of the Internet's col-

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lective bandwidth today is consumed by such video file downloads.

Despite the obvious impact video downloading has on Internet traffic flow, few consider this actually video. Video file downloads are just that—data file transfers. Rather than UDP, file downloads invariably use TCP, which provides file-quality checking and retransmission, and can also dynamically throttle transmission rate around congestion. A video download can take hours, even over a beefy broadband connection. By comparison, most broadcast, video on demand, and videoconferencing require low overhead and timing consistency—and so use the simpler UDP over IP.

“Such file downloads may not be recognizable as video at all until after the fact,” says Loki Jorgenson, Chief Scientist of Apparent Networks.

The network test and measurement community, as far as video-traffic tracking and quality assessment, seems to be following the money. And at the present time, that means products oriented mainly for carriers and service providers for

measuring and tracking broadcast and on-demand video services.

Figure 2 provides a thumbnail summary of leading wares offered today for video traffic monitoring that turned up in our survey. This may not be an all-inclusive listing.

Two of the packages, Brix Networks’ BrixVision Live Monitoring and Tektronix’s GeoProbe Video Performance Monitoring and Unified Assurance, track only broadcast and on-demand video monitoring. Both are oriented only to carriers and service providers.

The Brix and the Tektronix products can also rate the quality of individual video streams. While there are a few published specifications that touch on video-quality assessment, such as RFC 4445 and ETSI’s TR 101-290, virtually all of the video-quality assessment algorithms employed today, including all the products shown in the table, are proprietary. This means that the same video stream could be rated quite different by different

vendors’ monitoring packages.

“Video-quality assessment is still in its infancy,” says Brix’s Laura Holly. “Organizations including the DSL Forum and the ITU are working on video-quality standards. But that standards process is measured in years, not months. In the meantime, customers out there face very real quality challenges for their very real services.”

Many of the survey respondents point out that tracking and reporting on video quality is a multi-headed conundrum.

“There are at least three levels of quality involved: the quality of the network, the quality of the application (i.e., codec), and the quality of the user experience, including psycho-visual effects,” says Apparent Networks’ Jorgenson. “Measuring each requires distinct models and methodologies. Quality of user experience is often referenced, but that is not typically what is measured.”

From the network-level perspective, all of the products in figure 2 can assess the network’s effect on, and ability to

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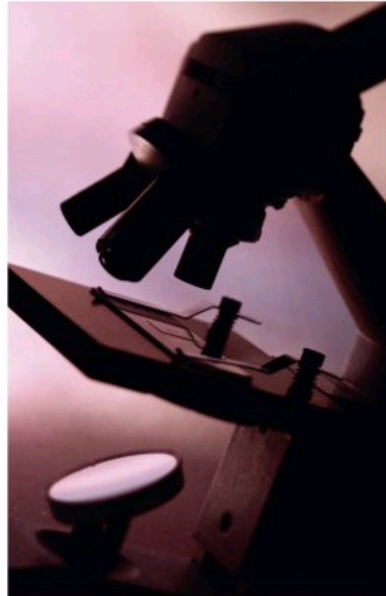


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carry, video streams with acceptable levels of delivery quality. It is in the higher application layer—rating the actual video-stream quality—that they differ the most.

For example, Apparent Networks' AppCritical and Nectordia's NetMRI do not address application-level assessment of video streams. That's because neither directly observes video traffic. AppCritical assesses the network level by actively sending and then rating its own simulated video streams. And NetMRI analyzes information about traffic it receives from other network devices, using the NetFlow traffic-reporting protocol.

Several other vendors say they are able to identify most types of video traffic, report the network-level issues affecting video streams, and also provide quality ratings of the video streams. These include JDSU's QT-600 probe and analysis software, Spirent's VTS (Video Test System), Telchemy's VQMon/SA-VM,



and WildPackets' OmniPeek Enterprise with Enhanced Media Options.

Still, these are very different products, with a very diverse range of price tags. Telchemy's software, for example, is typically licensed by other vendors and incorporated into their network devices and packages, and not sold directly to end users.

Users shopping for video-monitoring products need to understand how diverse this emerging class of products are, what they profess to do, and what they don't do. More importantly, users need to have a good idea of what they want to measure in terms of type(s) of video traffic and at what level. **V**

Ed Mier, VON Magazine's test and measurement columnist, runs MierConsulting LLC (www.mierconsulting.com), which focuses on VoIP and network monitoring, measurement, and management. He has designed and installed dozens of local and worldwide networks and been involved in many VoIP rollouts. He can be reached at emier@mierconsulting.com.

VIDEO TEST & MEASUREMENT, SHORT LIST

Vendor	Product, version	Package, orientation	Package, orientation	Package, orientation	Assesses net, transport-level performance, suitability for video
Apparent Networks, Inc. Vancouver, BC, Canada www.apparentnetworks.com	AppCritical, v3.1	Software, for carriers/SPs and enterprises	Software, for carriers/SPs and enterprises	Software, for carriers/SPs and enterprises	Yes
Brix Networks, Inc. Chelmsford, Mass. www.brixnet.com	BrixVision Live Monitoring v6.0	Hardware and software package, for carriers/SPs	Hardware and software package, for carriers/SPs	Hardware and software package, for carriers/SPs	Yes
JDSU Milpitas, Calif. www.jdsu.com	QT-600 v4.1	Hardware probe and software, for carriers/SPs	Hardware probe and software, for carriers/SPs	Hardware probe and software, for carriers/SPs	Yes
Nectordia, Inc. Annapolis, Md. www.netcordia.com	NetMRI, v2.2	Appliance, for enterprises	Appliance, for enterprises	Appliance, for enterprises	Yes
Spirent Communications Calabasas, Calif. www.spirent.com	Spirent Video Test System (VTS)	Hardware, appliance, for labs, network or field testing	Hardware, appliance, for labs, network or field testing	Hardware, appliance, for labs, network or field testing	Yes
Tektronix, Inc. Richardson, Texas www.tektronix.com	GeoProbe Video Perf. Monitoring and Unified Assurance v6.3	Hardware and software, for carriers/SPs	Hardware and software, for carriers/SPs	Hardware and software, for carriers/SPs	Yes
Telchemy Atlanta, Ga. www.telchemy.com	VQmon/SA-VM, v2.2	Software, typically licensed by network equipment vendors	Software, typically licensed by network equipment vendors	Software, typically licensed by network equipment vendors	Yes
WildPackets, Inc. Walnut Creek, Calif. www.wildpackets.com	OmniPeek Enterprise with Enhanced Media Options, v5.0	Software, for carrier/SPs and enterprises	Software, for carrier/SPs and enterprises	Software, for carrier/SPs and enterprises	Yes

Source: MierConsulting, LLC

Figure 2