

Testing times

A slow-down in subscriber uptake in the face of stiff competition, as well as the looming threat from OTT providers, could force IPTV operators to invest more in quality assurance. Stuart Thomson reports.

It is well-known that IPTV networks require a great deal of care and attention, as telecom infrastructure was not designed with video in mind. Yet investment in systems to ensure quality to some extent took a back seat in the rush to get video services up and running – a task that required a great deal of effort and ingenuity in itself.

Now, as telecom operators begin to find it harder to grow their IPTV subscriber bases in the face of a resurgent cable industry and stiff competition from satellite pay-TV operators, as well as threats from digital-terrestrial services and, more recently, over-the-top providers, quality assurance is moving centre stage.

Linear and VOD

The first quality assurance measure operators must undertake is clearly to design the network properly to accommodate both video-on-demand and linear services.

The former has its own quality assurance requirements. The unicast nature of the service means that traffic engineering planning is key, particularly at peak viewing times. If the network can't cope, problems will arise. The fact that VOD services are often sold on a pay-per-view or subscription basis means that protecting the quality of the service becomes all the more important.

VOD systems require a number of different levels of quality assurance, according to Mikael Dahlgren, managing director of Sweden-based quality assurance specialist Agama Technologies. First, the video quality of assets needs to be verified before they are loaded onto the video service. Second, the servers themselves have to be tested thoroughly to ensure that the video can be delivered when requested. Beyond, that, operators should, he says, monitor each session at the set-top level. "This is the

only place in a delivery chain where one can know how a VOD service scales," he says. "It is also the only place where it makes sense to understand how the viewer experienced the VOD service and measure set-up time as well as other important session-oriented parameters of delivery."

While IPTV networks share a number of characteristics with cable, IPTV providers do not broadcast content, as cable operators do, with the set-top taking on the role of tuning to the required channel.

IP-based networks also suffer from particular weak spots. According to Dahlgren, difficult areas include the switched/routed and packet-oriented IP transport itself as well as the bridging points to lower bandwidth access networks. The transport network problems can be exacerbated by jitter – the displacement of

Tektronix's VQS1000 can identify various video faults.

pulses in a digital signal. "Generally what differs from a transport perspective between a cable service and an IPTV service is just the use of another media – packet-oriented IP instead of the fixed bit-rate modulated signal on cable," says Dahlgren. "This is [deployed] in combination with the use of single programme streams and set-top boxes with de-jittering buffers making them more robust."

However, despite cable network operators' advantage over telcos of being designed for video distribution from the start, a few technologists believe that IPTV has some intrinsic advantages. "The HFC [cable] plant requires QAM or RF modulation at the edge of the network for digital video," says Ron Shanks, video



solutions owner at technology provider JDSU. “The multiplexing and modulation process, which is very complex and prone to error, is handled at the edge of the network and results in much more complexity at many more locations than with IPTV operators.”

Close to the edge

For Ben Schwarz, an industry consultant and former head of IPTV deployment at Orange, a key recent trend is a move by service providers to monitor closer to the edge of the network, the logical conclusion being to monitor the set-top itself. “Monitoring the headend is now accepted as standard practice. So when people in the industry say that monitoring is moving from the headend closer to the edge, what I see is that more and more operators recognise that monitoring the set-top with an embedded agent is a necessary step,” says Schwarz.

John Williams, director of emerging markets at technology provider JDSU, agrees, arguing that operators need to put in place a comprehensive end-to-end service assurance

programme. “This includes thorough new service testing of the access plant, and ownership of the in-home distribution network from a quality point of view,” he says “Remote monitoring of consumer premises equipment performance is critical after installation. Service providers have now taken this on-board and are making significant investments to deliver that expected Quality of Experience.”

Williams’ colleague Shanks concurs, putting forward the view that the emergence of the use of the consumer premises equipment as a network monitoring device marks a step change in service assurance methodology. “Most of the problems in the network occur on the last mile and in the home and the only way to cost effectively monitor this portion of the network is to use the CPEs – residential gateways, set-top boxes, ATA, ONT, etc – as service monitoring devices,” he says.

Jean-Michel Planche, CEO of quality assurance specialist Witbe, says that the user experience is the element that technologies should bear in mind, focusing on the availability of services, performance (including channel change times) and integrity (the absence of

blockiness and jitter and the presence of a clear picture). Planche points out that IPTV providers were initially focused on getting something up and running in order to compete with existing service providers including cable operators. Quality assurance therefore took a back seat to other considerations. “New kinds of service need new monitoring technology, fully end-to-end and fully user centric,” says Planche. “Classic QoS is too network-centric...but the goal is user satisfaction.”

Agama’s Dahlgren agrees, up to a point. “In the end, I think it is easy to agree that the only thing that matters from a business perspective is the service experience with the end user. Just understanding this parameter would make it hard to improve the quality – one also has to understand the root causes to be able to improve the quality,” he says.

Quality assurance systems need to look at the headend, the network and the home. For Agama, viewer experience should be simulated at various points in the network, because, for example, a problem found part-way down a multicast network will extend to all viewers downstream.