

Mass adoption via the PC

The long awaited advent of 3G services has finally arrived. While traditional voice will continue to be an important part of an operator's service offering, one of the primary drivers to draw new consumers into 3G are high-speed data services, new video telephony services and video content services.

In both Europe and Asia, 3G data services are being marketed with supported data rates of 384 Kbps -- comparable in terms of user experience to ADSL. While the mobile operators are deploying high-speed data services as their initial enhancement to the voice networks, services centred on video are the primary differentiator from 2.5G networks.

New services in 3G networks include real-time video telephony services such as peer-to-peer video conferencing, multi-conferencing, video mail, as well as infotainment video portal services which include real-time content streaming broadcasts. The challenge is for these devices to interact with each other and with the network equipment seamlessly and efficiently.

To develop a market base for video telephony services, a broader deployment of terminals is required. It is obvious that it takes at least two people to conduct a video call, and that is why some of the 3G mobile operators are now offering "specials" for the purchase of two 3G mobiles.

3G PC video-telephony clients

New 3G-324M PC video clients are being introduced that extend a PC's capabilities to support real-time conversational video. Laptop PCs equipped with a 3G data card enable users to make wireless video telephony calls and greatly increase the potential installed base of subscribers capable of initiating and receiving video calls. Such products should comply with 3GPP 3G-324M and ITU-T H.324M standards, which are the protocols of choice for offering conversational multimedia services such as video telephony, video conferencing, video mail and real-time streaming over 3G networks.

Many analysts predict that mobility is the ingredient that will make the recipe for mass-market adoption a success for real-time video conferencing video services. As the subscriber base is in its infancy, the likelihood the party who is trying to be reached has a video phone is minimal. However, the largest market potential for video calls is to include the huge installed base of broadband fixed network users. By simply adding a USB camera to a PC and utilizing a video client such as Microsoft Net Meeting, or even specialised video telephony clients, the potential for video enabled terminals is instantly enormous.

To facilitate the connectivity between 3G phones and PCs, multimedia gateways or video gateways are needed that mediate between the various standards and also translate (or "transcode") media bit streams from the codecs on one end of the call to the codecs on the other end.

Multimedia gateways handle signalling, call control, and conversion of multiple protocols and media streams. Traditional media transcoding methods such as “tandem transcoding” have proven to be inefficient and costly. An efficient transcoding methodology such as Unicoding is necessary to support widespread connectivity and keep costs low, making the services affordable to the end-user. Unicoding technology offers very high channel densities for transcoding between various multimedia standards by performing intelligent mapping between the standards in the code space. This allows operators to offer cost effective value-added services to their customers.

Several architectural approaches exist for the implementation of the real time/or near real time video telephony services. Typical network architecture required to deploy these video services consists of a number of functional units that are responsible for call setup and establishment, and the provisioning of real-time or near-real-time content, user interfaces, management, billing and programmability. These network elements include:

- H.324M/3G-324M multimedia gateway
- Gatekeeper
- Multi-conferencing unit (MCU)
- Portal Server
- Content servers (real-time or recordings)
- Video-mail server

Quality challenges

The 3G-324M protocol uses a 64-Kbps circuit bearer for the transport of call control, voice and video information of a video telephony call. While bandwidth is guaranteed, it is quite small and therefore maintaining good quality of service is a challenge. Fortunately, video compression technology has advanced enough to make reasonably good quality video service available.

Call setup delay is another important factor. Because of the increased exchange of control and media information that needs to occur before voice/video exchange, a typical video call may take anywhere from 6 to 20 seconds for a mobile to mobile videophone connection to be completely established. Recent technological advances in this field can lead to reduction in call setup times by almost 50-70% using a technique that involves intelligent exchange of call setup parameters.

High-quality voice and video delivery requires low end-to-end delays to minimise the impact on latency-sensitive communications as data traverses diverse mobile networks. In order to offer services UnicodingT eliminates the delays that occur with older tandem transcoding methodologies. This results in fast transcoding, and the lowest delays available, while efficiently moving data streams across diverse networks with multiple protocols and formats. Delays for other gateways are variable between voice and video. Tandem transcoding induces voice delays typically between 40-60ms, and 70-120 ms for video. In order to synchronize voice and video, tandem transcoding must delay the voice equal to the video delays, causing potential synchronization problems and a poor user experience.

by Lee Ellison, SVP of Sales and Marketing at Dilithium Networks