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MPEG - 4:H.264

READY TO DOUBLE THE CHANNELS

MPEG-4:H.264 Is Commercially Ready To Launch And Deliver Twice As Many Digital Channels Over The Same Satellite, Terrestrial Or CATV Bandwidth

The now almost universal MPEG-2 digital encoding standard was approved almost 11 years ago.

Last year, almost 10 years after the MPEG-2 standard was declared, a new standard : H.264 also called MPEG-4/AVC was declared and patent licensing is being finalised in 2004.

NEW STANDARD

The H.264 standard is a radical change over the earlier MPEG-2 standard. The use of MPEG-4 (See SCAT July 2001) enables a television channel to be compressed and transmitted in half the bandwidth required if MPEG-2 compression was used. Looking at it the other way around, H.264 can transmit twice as many channels on a single satellite transponder compared to the existing MPEG-2.

Most satellites in the region compress 6 to 8 TV channels per transponder. Scientific Atlanta and GI infact offer statistically multiplexed MPEG-2 compression streams capable of 16 channels per transponder. H.264 will now, in a single stroke double this figure!

MPEG-4 H.264 is a compression standard that can be widely used not only for satellite transmissions but even for terrestrial TV, CATV, and even IP (Internet Protocol) TV.

DISADVANTAGE

The new H.264 standard has a single disadvantage. It is not backward compatible with the older MPEG-2 compression. This means that existing (MPEG-2) digital satellite receivers cannot receive H.264/MPEG-4 compressed content.

Much like MPEG-2, MPEG-4 also introduces some visible digital compression errors (artifacts). These artifacts are quite different from MPEG-2 artifacts but somewhat less noticeable.

APPLICATIONS

Due to H.264 incompatibility with MPEG-2, the new compression scheme is most likely to be adopted first by "green field" applications, which have not used MPEG-2 in the past. The top contender is probably mobile phones to receive TV programming. H.264 can efficiently deliver low bit rate video to mobile phones, palm hand helds, and other devices.

The video phone, offering both video and audio on an existing phone line could become a reality using H.264. Several telephone companies infact are exploring use of H.264 compression to deliver video over DSL lines.

This may be a key to delivering IPTV over bandwidth starved twisted pair copper lines that were originally designed to carry only 0.03 MHz (3 KHz) for a telephone conversation.

HDTV

High Definition TV (HDTV) is now being rolled out in the USA, Canada, Japan and Europe. HDTV offers 4 times the resolution of regular (Standard Definition or SD) TV. The higher resolution also implies the requirement of 4 times the SDTV bandwidth for HDTV. Hence instead of 5 MHz for a single NTSC channel, a single HDTV channel demands a 20 MHz bandwidth!

H.264 offers broadcasters the option of either carrying more channels within the same bandwidth or alternately, upgrading their channels to HDTV, using the same bandwidth but shifting to MPEG-4 H.264. This option could well turn out to be popular over the next couple of years.

DECODERS

Satellite broadcasters ofcourse stand to gain the most from H.264. The new compression scheme will cut in halve, their recurring cost of satellite bandwidth. However, existing DTH providers cannot deploy H.264 because they would have to scrap the several thousand MPEG-2 decoders already deployed with their customers.

On the other hand satellite broadcasters (such as those addressing India) who broadcast from satellite, primarily to a limited number of cable headends can consider using the new H.264 technology.
H.264 is ofcourse the ideal solution for a new satellite channel that targets last mile carriage through a cable network. The new satellite channel can from day 1 deploy MPEG-4 / H.264 boxes to all cable headends. The reduction in transponder cost by 50% would ensure that the box is paid for themselves probably within the first year of operation.

COSTS

As with any new technology, the current cost of H.264 hardware is high. H.264 encoders currently cost between US $20,000 to US $50,000 each. Ofcourse, encoders are only required by the broadcaster before uplinking to the satellite.

Currently, H.264 decoder boxes are available for US $2,000 to US $5,000. These figures will almost certainly crash once mass production commences. Industry experts project that within 2 years, an MPEG-4 H.264 satellite TV decoder will cost the same as today's MPEG-2 digital satellite receiver.

COMPETITORS

MPEG-4 is an open, non-proprietary standard, like MPEG-2. This will almost certainly ensure its widespread adoption. As an open standard, H.264 does not have a significant competitor. However, Microsoft has been promising VC-9, a compression scheme for Windows Media 9, which is even more efficient than H.264. Ofcourse VC-9 will only work with Microsoft's proprietary software. Also, VC-9 is likely to be ready atleast a year from now.

THE FUTURE

After reigning supreme for more than 10 years, MPEG-2 will have to make way for MPEG-4. Given the huge savings in bandwidth, H.264 is likely to become the defacto digital compression standard for satellite broadcasters, within the next 2 to 3 years. ■

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