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10 YEARS OF DVB
NEW SPECS FOR DVB-X & DVB-S2 EMERGING

The Digital Video Broadcast (DVB) standards body was formed 10 years ago in September 1993. When formed, the DVB group consisted of 83 different member companies. Today the DVB organisation boasts of 280 member companies. To date, the group has produced 44 different DVB specifications and 19 separate guidelines. DVB continues to grow and release new specifications that will ensure standardisation and interoperability for an increasing number of formats and devices.

The most significant new DVB standard currently being worked on is DVB-X. The DVB-X specifications are now just beginning to crystallise and its technical requirements have been outlined and are under discussion. DVB-X will become "a mandatory spec for handheld devices in the future," said Goeran Wahlberg, Nokia Corp.'s director for concepts and technology.

DVB-X is a specification that will link broadcast systems to personal communication devices like mobile phones and PDAs (Personal Digital Assistants). The DVB-X standard will provide, amongst other facilities, video and television on mobile phones and PDAs. "Phones with some kind of camera attached can reach numbers in the range of 300 million by 2006," says Kathleen Maher, an analyst at Jon Peddie Research. The same standard would be applicable even for mobile to mobile video conferencing and various other facilities.

Ofcourse providing high bandwidth links between two specific mobile phones would be, using current technology, and extravagant use of bandwidth, making it unviable. Mobile phone operators are each allocated a very limited range of frequencies (spectrum) which they can use for voice links between their customers. More often than not, the allocated spectrum is insufficient during peak hours. Hence, minimal use of bandwidth is always a key requirement for mobile operators.

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During its initial implementation, the DVB-X standard will be used for transfer of data and information on a "One-To-Many" basis. This could include application such as streaming television content simultaneously to all mobile phones and PDAs that choose to receive the transmission.

For television transmissions, the DVB-T standard is already in place, robust and widely deployed. Infact, DVB-T is currently being used for transferring road information to production model cars in Germany. Unfortunately, the current crop of chips used in the receivers are far too power hungry for use in mobile phones and PDAs.

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The DVB-X technical requirements includes power consumption of less then 100 milliwatts for the complete front end, "including the RF parts"; a data rate of 15 Mbits/second; operation in a large, single-frequency network; reception at high driving speeds; and only one antenna.

The ad hoc group hopes to achieve backward compatibility with DVB-T in the first phase of its work. "But if a full scope of its advantage cannot be achieved, we may move on to a new scheme that is not necessarily compatible with DVB-T," said Nokia's Wahlberg.

OTHER CONCERNS

Beyond the need for high processing power and the impact on power consumption and battery life comes the issue of memory for storage. "What does one do with the resulting video file?" Fahey asked. "Is it being streamed, or downloaded and played back later?"

Next comes the question of whether the handset has enough program memory to contain the decoder/ encoder software. A further complication is the sticky issue of digital-rights management. Fahey warned, "If the handset is capable of storing a downloaded video clip for later playback, how is this handled? Can it be viewed multiple times? Can it be copied?"

Professor David Crawford, managing director of Harris Europe also chairs the (Universal Mobile Telecommunications System) UMTS-DVB group which has the task of bringing together the broadcasting and telecom worlds so that DVB-T and DVB-X can integrate seamlessly together.

DVB's UMTS ad hoc group, consists of broadcasters, telecom operators, network equipment vendors and system companies.

Combining the two platforms in one handset might be easier said than done. The building blocks required for such a platform include everything from front-end and signal-processing technology to Internet Protocol (IP) infrastructure for DVB services and new coding schemes.

Handsets, for example, would require a convergence device able to receive signals from cellular networks as well as DVB-T/DVB-X broadcast transmissions. A handset would also have to process IP data packets and video signals distributed over MPEG transport streams.

To complicate matters, the software architecture built into such a handheld device would have to handle two software platforms: one currently in development by the Open Mobile Alliance for the mobile industry, along with the DVB's interactive Multimedia Home Platform.

By mapping the different blocks into a DVB/UMTS framework, "we are trying to figure out who needs to talk to whom," said Crawford.

Although the standard chosen for the Universal Mobile Telecommunications System is based on MPEG-4, providers in Japan and South Korea with video services today are deploying proprietary codecs. J-Phone is using Office Noa's Nancy codec for its Sha-mail service in Japan, and SK Telecom uses Thin Multimedia's proprietary codec for services in Korea. Such proprietary software-

based codecs "require less bandwidth, less memory and less processing horsepower, and can be tweaked to trade off resolution against frame rate, depending on the video content," Fahey explained.

INCREASED COMPRESSION

Ken McCann, chairman of the DVB AVC (Audio Visual Coding) team and director of ZetaCast is optimistic of elegant compression algorithms emerging, which will provide increasingly better compression of data. McCann announced this recently as "McCann's Law" which states that "the bit rate required to achieve a given audio / video quality reduces by an average of 15% each year"

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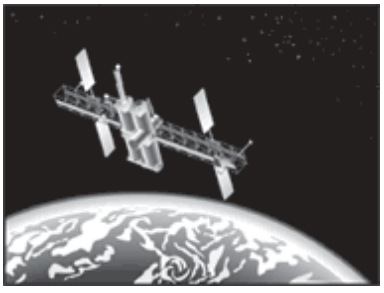
To support his hypothesis, McCann points out the progress made not only from MPEG-2 to MPEG-4. Even MPEG-4 has evolved to its current Part 10 status. MPEG-4 part 10 provides very good quality at bit rates of even 1.5 MBps, which is less than half that required by MPEG-2.

Microsoft too has been actively involved in low bit rate video and audio playback. Microsoft and Reliance Infocomm recently declared that they were working together for providing high quality streaming video for Reliance's IPTV applications that it plans to commercially deploy in early 2005. Infact, Jim Beveridge of Microsoft demonstrated HDTV (High Definition Television) on a laptop using Windows MediaPlayer 9.

Clearly, work on the DVB-X standard is on at a frenzied pace and the first commercial DVB-X devices are likely to emerge in early 2006.

NEW DVB SATELLITE STANDARD

The DVB-S standard has served satellite broadcasters for almost a decade. DVB-S was one of the first DVB standards to emerge - months after the September 93 formation of the DVB group. The DVB-S standard is now almost universally used by every digital broadcaster.



Ulrich Reimers, a professor at the Institut fuer Nachrichtentechnik (Braunschweig, Germany) and chairman of DVB's Technical Module, has announced that a new standard; DVB-S2 will be formalised shortly. The DVB-S2 standard will incorporate technological improvements that have been made in modulation and coding techniques during the past 10 years. Professor Reimers announced that DVB-S2 would provide a 30% increased bit rate capacity compared to the earlier DVB-S specification. DVB-S2 would also be more robust.

The techniques to be used in the new specification have been undergoing rigours simulation and a final specification is likely to emerge very shortly.

Given the widespread deployment of DVB-S and the millions of digital satellite receivers already sold, the new DVB-S2 standard will be backward compatible with the original DVB-S specifications. DVB-S2 will use a layered hierarchical structure to ensure backward compatibility.

DVB-S2 will almost certainly be adopted quickly by broadcasters who will stand to gain at least a 30% reduction on their transponder cost given the better compression capabilities and robustness of DVB-S2.

NEW CHINESE STANDARD - AVS

While most of the world is gung-ho on DVB standards, there is a strong voice of dissent from China. China, with its focus as a low cost, high volume manufacturing base, is objecting loudly against the high cost of licensing DBV products. Currently Chinese manufacturers pay an average royalty of US $4 to US $5 (approximately Rs 185 to Rs 230) per DVB product manufactured. The Chinese government states that AVS equipment manufacturers will be called upon to pay a mere 1 yuan (Rs 5.50) per AVS product as a royalty. "The Chinese people stand to save US $300 million in the next 10 years .... with the arrival of a domestic Audio Video coding Standard (AVS) next year reports the government run China Daily."

China is developing its own home grown, MPEG style digital compression standard known as AVS. AVS will apply to digitally compressed video delivered to digital TV receivers, DVD players and multimedia cellphones. In essence, China threatens to boycott DVB-S, DVB-T and DVB-C and replace it with its own AVS.

Gao Wen, head of the AVS standard working group, supported by the ministry of Information said, "The AVS standard will be based on public domain technologies and Chinese inventions so that it will be free from patent or royalty demands from foreign organisations".

AVS POSSIBLE ?

Can China reinvent digital compression? An industry observer says he "would be surprised if the Chinese would be able to come up with a standard that did not infringe on many, many patents throughout the world. The problem isn't the capability of China's AVS programers but that the basics of digital compression are already covered in MPEG's patents".

Some industry observers question whether China is serious about reinventing digital compression. Could AVS just be a ploy by the Chinese government to beat down patent payments?

The success of any new technology in today's world hinges around its widespread acceptance. Will the AVS standard be adopted by others around the world, making Chinese equipment marketable elsewhere ? Surprisingly a Dow Jones news wire report of 30th July 2003 states "Reflecting the importance of the Chinese market, the local research arms of multinationals like International Business Machines, Royal Philips Electronics and Microsoft Corp. have signed up as members of the standard's working group." ■

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