

Standardizing Extended Copy Control Instruction Messages - A Bad Idea

By David Broberg, © May 16, 2001

Recently proposals have been made to ATSC, SMPTE, SCTE and probably to other standards setting bodies as well to develop industry standards for an extended copy control instruction set (ExCCI). These proposals attempt to define a master set of complex instructions meant to limit or restrict copying by receiving devices that are designed to monitor such signals. While it is certainly important to define systems that will provide a variety of tools that provide for the protection of intellectual property rights, standardizing on a single copy control message structure is a bad idea.

These ExCCI proposals have been developed exclusively by the motion picture studios and all have three common flaws. First, they have chosen the wrong point of origin for such a signal. Second, they selected the wrong delivery channel for such a message. Third, they inherently lack the necessary connection to applications that are used to implement such copy control functions. Each of these flaws is examined in more detail below.

Where is the right place to originate a message that defines limits on copy permission? Each of the ExCCI proposals defines a system where the message originates with the production of the content. However such an approach precludes control of the message where it belongs - in the hands of the program distributor. Let's not forget that the application of any copy protection control is the result of negotiation between the content owners and the program distributor.

In the case of cable TV distribution of TV programs, the cable operator has the ability to transmit a single program and sell that program at different prices depending on the extent of recording rights that are assigned to that program. Pay a little more, and you can make a single copy, save a little on the price if you're willing to give-up your right to tape. It's a flexible approach that saves bandwidth and ultimately allows consumers to determine what they are willing to pay for. If the ExCCI messages originate at the point of production such a flexible system is not possible.

What is the right delivery channel for the transport of such a message? Each of the ExCCI proposals says that the best place to transport ExCCI messages is in the MPEG user bits as part of the program transport stream. While such a method seems to be universally suited for a variety of distribution channels, we shall see that it is not the best choice.

The first problem with the carriage of ExCCI messages in the MPEG stream is that it becomes difficult (but not impossible) to modify these messages downstream or at a later date. In most cases, if a version of the program is needed with an alternate setting for the copy instructions, a totally separate tape or satellite feed is needed to deliver that version of the program. For programs stored for subsequent redistribution or reruns, it is impractical to alter the copy restrictions at the later date.

The next problem with transporting the ExCCI message in the MPEG stream is that it becomes impractical for the cable operator to alter or set the copy protection message at

the headend. The operator may have a need to alter this message to better match the unique copy permissions that may be possible by the applications and equipment used on his plant. Innovation and advancement in technology that provides unanticipated new control over copy right protection will certainly be deployed after such an ExCCI standard is published, or after the content is produced.

Another significant limitation of using the MPEG transport stream to carry the ExCCI message is that it doesn't allow the subscriber to make future program selections based on review of the copy restrictions. How disappointing it will be if the subscriber goes out of town and sets his PVR (or VCR) to record a program that can't be recorded because of the ExCCI message that accompanies the program in the MPEG stream. To fully satisfy this requirement, any ExCCI message will have to be transported as part of the guide data or in separate tables that have specific program associations.

Finally, the proposals for ExCCI standards lack any connection to the applications that will be running on the receiver that responds to these messages. Such a connection is necessary to authenticate the message itself in order to detect tampering or alternation of the message. The security of a single broadcast message that is part of the MPEG stream is very weak and vulnerable to spoofing. The application that responds to such a message will have no way to detect such unauthorized alteration unless that application is specifically tied to the originator of the message.

Cable operators are in a unique position to be able to offer such control and verification of the message. By sending any copy control instructions over proprietary out-of-band channels, the operators conditional access system can be used to secure the message itself. Because the operator has control over the authorized applications that are running on his cable system, he can build in authentication routines that can detect altered messages.

In conclusion, the current proposals to carry standardized ExCCI messages as a part of the MPEG transport stream are bad ideas. By allowing cable operators to define and transport their own ExCCI messages over proprietary data channels additional security and flexibility are provided. Such proprietary message systems can be secure, authenticated, provide added flexibility to accommodate innovation, can be tied to proprietary EPG systems to allow future scheduling ease, and can allow a variety of permissions to accompany the delivery of a single TV program.

REFERENCES:

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SCTE – DVS/323 (April 2000)

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