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Deal pushes algorithms into digital radio

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COLORADO SPRINGS, Colo.— Digital Fountain Inc. will announce licensing pacts this week with Honda Motor Co. and XM Satellite Radio Inc. that will push its data-transport algorithms into digital radio.

The Raptor algorithms, based on the company's patented Luby Transform Codes, promise full data transmission without packet retransmission, essentially replacing TCP transport with what the company calls "metacontent" packets.

Honda and XM have not said how Raptor will be used, but Digital Fountain president and chief executive officer Charlie Oppenheimer said that auto manufacturers want to use satellite radio as a baseline service for providing "Tivo-like" functions within the in-car network, including video storage and retransmission, global-positioning satellite coordinate updates and Internet data services. Synchronizing such services would be next to impossible in normal terrestrial cellular or satellite networks, since moving vehicles go through dead zones.

Oppenheimer said that the work of the company's founder, University of California at Berkeley professor Michael Luby, is similar to math principles on the solution of simultaneous linear equations, implying that receipt of packets in an aggregate length equal to the size of the original transmission would allow reconstruction of the message, regardless of whether packets were dropped.

"This eliminates acknowledgement and re-transmission, because it doesn't matter which packets you receive," he said.

The algorithm can be embedded into traditional codecs, but is not intended as a replacement for compression. In fact, Sumitomo Electric Co. has licensed the Digital Fountain technology for use with MPEG-4 codecs for its StreamCruiser Internet Protocol-based set-top box. The metacontent packets essentially eliminate the need for forward-error-correction circuits, which could radically change the design of broadband wide-area network line cards if the algorithms are widely adopted.

The metacontent packet creator, which can be implemented in a server or other centralized hardware system, uses UDP unicast or multicast to send the packets to other nodes in the system. Oppenheimer said that Digital Fountain anticipates using its algorithms as a basic Layer 4 transport technology for a variety of future markets.

"Another area we're seeing immediate interest in is transmission of video over 802.11 wireless networks," Oppenheimer said. Transmission of loss-free video can be implemented over Wi-Fi, digital subscriber line or cable, he said, and over any virtual private network operating at Layers 2 or 3.



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