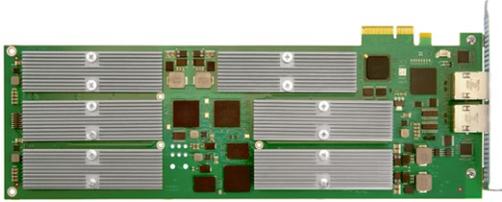# So You Want to…

Add Voice Transcoding to a Session Border Controller (or other Network Gateway) Application?

The PCIE-8120 Benefit

Emerson's PCIE-8120 is an industry-leading PCI Express® (PCIe) media processing accelerator board. IP media streams can be redirected within an appliance to the PCIE-8120 and voice transcoding can happen without making any use of existing processing resource. A single PCIE-8120 can scale from 2500 to over 7500 simultaneous channels of G.729 encoding, and most common wireline and wireless codecs are available as part of the package. When compared with the cost of commercial host media processing software plus the additional server capability required to run it, the Emerson PCIE-8120 offers a lower overall cost of ownership.

PCIE-8120 supports the following 3GPP, ITU-T, IETF and other voice codecs:

- Uncompressed telephony: G.711 µ-law/A-law with Appendices I and II
- Narrowband compression: G.729AB, G.729.1, G.723.1A, G.726, G.727
- Wideband compression: G.722, G.722.1
- Wireless network: GSM EFR, AMR and AMR-Wideband; EVRC and EVRC-B
- Internet voice: iLBC, SILK (Skype), Opus [roadmap]

In addition, each voice channel can support echo cancellation, announcements, conferencing, mixing, and a full range of tone detection and relay functions.

PCIE-8120 is a full size PCI express board designed for use in both enterprise and NEBS appliances. Find out more at **www.emersonembedded computing.com**

Network security gateways, of which session border controllers (SBC) are an oft-quoted example, are characteristic of "bump in the wire" devices that form a bridge between trusted and untrusted networks or enterprises. Their job is to analyze and characterize incoming IP traffic, block undesirable or unauthorized flows, and let through approved traffic. In communications networks, a lot of this traffic is media streams. As this is a gateway point, many SBC users are also interested in providing additional media format translation in addition to the stream management. Even simple requirements like DTMF tone monitoring require that the media streams are decoded and analysed.

Potential Solutions

Media streams tagged for analysis or for transcode are sent to specific media processing tasks. This could be:

- An external IP:IP media gateway device
- An internal software solution, perhaps running within a local virtual machine
- An internal media processing accelerator offering hardware-accelerated voice transcoding

Using an external media gateway is perhaps the simplest to envisage. The border gateway terminates principal traffic streams, and redirects media to the external gateway for transcode via external ports. Media can come back into the border gateway for egress filtering. The disadvantage is that this is costly, uses rack space and extra power, takes up valuable physical network interfaces off the border gateway, and still requires application development that controls and configures media stream handling on a stream by stream basis. The other two solutions allow for this function to be taken inside the box of the border gateway.

An internal software solution, for instance using commercially available "Host Media Processing" software from suppliers like Dialogic, necessarily makes use of internal processing resources. While this would be a great solution for a moderate number of simultaneous channels, it does not scale effectively. At upwards of 1200 simultaneous channels of G.729 encoding, the software solution approaches 50% utilization of a typical server, starving the original application of processing resource. Effectively this means that additional servers would be required to offer higher densities of voice transcoding, and the cost of the commercial software that is usually charged on a per-channel basis soon mounts up.

For higher channel densities, the best solution is adding a hardware-assisted accelerator. This keeps the function internal to the border gateway AND avoids the loss of central processing resource that would otherwise be required to run a software solution.