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PRODYS



LIVE AUDIO CONTRIBUTION OVER WIRELESS NETWORKS

Wireless “live” contribution from anywhere at any time, this is the ultimate goal for most news reporters. The old favorite of using ISDN is becoming harder and much more expensive to access easily. Today most of us use wireless daily, in particular Wifi and HSPA/LTE 4G networks. These are now mature technologies and widely used for many applications in the home and whilst out and about. However there are still some professionals who prefer to persevere with the traditional, costly and limited ISDN communication technology before jumping into the wireless era.

The following reasons are likely to be the cause of their hesitation:

- Without doubt the main reason is that ISDN has been with us for more than 20 years, people are just used to it. Just plug a cable to a socket, then dialing a phone number, it's that simple.
- The overall roundtrip delay is acceptable for voice communication of reasonable quality (G.722 for less than 7kHz audio).
- Historically ISDN networks have had a reputation for being reliable. (Although nowadays the replacement of original ISDN circuits with ISDN emulation over IP networks does have issues with the lack of end user control of buffers and also, no guarantee that two B-Channels will have the same latency or delay.)

Usage:

Considering the first reason above, wireless technology is actually gaining supporters due to a no fuss and simpler end user experience. Cables and access to a mains power supply are not necessarily required. The reporter can move around on location and of course there are no ongoing call charges. This means the job can be made easier with greater flexibility and no sacrifice of audio quality.

Delay:

Looking at the second reason, wireless communication, as with any IP communication is not subject to the ISDN limitation of 64 or 128kbps bandwidth. As a result low delay and better performing compression algorithms can be used (e.g. Enhanced Aptx) improving the sound quality experience. Full stereo (20kHz bandwidth) or even four audio channels can be transmitted and received with a much shorter delay than using MPEG stereo encoding over ISDN.

The early developments of wireless links, 3G or HSPA, had longer round-trip delays (in many cases due to poor “back haul” connection to the Internet), but nowadays the LTE (4G) deployment used in most countries has amazingly reduced the delay to a few milliseconds. »



» Reliability:

Multiple users are now sharing large but not infinite wireless networks (Obviously this can be more cost effective than over ISDN). But sharing does mean “contention” which can happen whilst streaming audio. Although this is hardly an issue for web browsing, it can produce unwanted effects when used for “live” contribution. The chances of contention significantly increase in crowded surroundings (e.g. sport arena), but can be mitigated by using multiple connections from different suppliers as detailed below.

Assessing the different ways of accessing wireless networks, using Wifi typically from a phone based device (2.4GHz or 5GHz any 802.11 flavor) would present the highest probability of “contention” for network access. Plain RTP or SIP protocol streaming (with or without FEC), as typical smartphone apps support would not overcome the contention issues. The recommendation here would be to use a connection protocol featuring re-transmission of any audio information lost in transmission; PRODYS “BRAVE Bonding” protocol fulfils this function. Although the re-transmission method would increase the delay and data bandwidth requirement, it does in practice enable a smoother audio experience in heavily contended environments.

The contention over LTE networks is not as significant, but still possible under some circumstances. The reliability over LTE is further increased to a professional grade if more than a single LTE network is utilized for the connection. This method is used within the PRODYS “BRAVE Diversity” or “SIP Diversity” protocols. From two four LTE networks can be combined without adding extra delay, so this can be as quick as single network connection with the added bonus of increased reliability.

The field reporter can switch between BRAVE Diversity and BRAVE Bonding methods without changing settings at the receiving end. The receiving codec will just match the incoming pattern & protocol.

PRODYS, well known for its high end Audio Codecs has engineered and manufactured multichannel wireless IP codecs for over 10 years. The current codec family “QUANTUM”, inherits all this experience and now introduces the QUANTUM LITE which is a remarkable handheld codec providing four network interfaces

(2x LTE 4G + 1x Wifi + 1 Ethernet). Other multiuser PRODYS portable codecs which handle all of the issues discussed above are the QUANTUM W and Quantum XL products designed for 3/4 contributors.

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