How to … LC3

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A new Whitepaper by Bluetooth supports manufacturers who integrate the LC3 codec into their devices

As a co-developer of the LC3 codec, Fraunhofer IIS is frequently approached by businesses with questions encountered while optimizing the codec for the integration into their devices. To be able to give comprehensive support to all of them, Fraunhofer IIS suggested that the Bluetooth Special Interest Group (Bluetooth SIG) create a Whitepaper.

It contains a host of information that is very valuable for integrators during the development of their Bluetooth audio devices. Part of a standardization process are a range of tests that compare a number of codecs and their features in various scenarios. The decision, which technology is best suited for a certain standard is based on these tests and their results. They are usually not included in the normative text of a standard. They do, however, give useful insights into the strengths of the standards or rather of the technologies included. This makes them valuable sources of information for device manufacturers. The Whitepaper is available to all businesses, and they can find out from it which configuration of LC3 is best suited to their use case.

During the standardization process, the members of the Bluetooth SIG either check each other's tests or Bluetooth commissions new ones to create a neutral decision base. These tests show, why LC3 has been standardized as mandatory codec for Bluetooth Low Energy and how it is best configured to meet the requirements of certain situations. They also show that in some cases it might pay off to look for an alternative solution. Someone who is looking for short latency times can see from the tests in the Whitepaper, which times can be reached using LC3 and if these are suitable for their specific case. As an alternative to LC3, the European Telecommunications Standards Institute (ETSI) has standardized the LC3plus codec: a superset of LC3 with a range of added features, such as noticeably shorter latency times. The tests also show that in Packet Loss Concealment, which is crucial for wireless connections, LC3plus delivers a significantly better audio quality than the specified standard feature included in LC3.

"We were really happy that we had the chance to keep working on this Whitepaper with our colleagues from the Bluetooth SIG even after the standardization was done," says Alexander Tschekalinskij, Senior Engineer in the Audio for Communications Department at Fraunhofer IIS. "All of us wanted to support product designers and profile developers with the information they require to make the best possible decisions and to create outstanding products with Bluetooth Low Energy Audio."