

SKAA Wireless Audio Standard

Bluetooth and AirPlay are the dominant wireless audio standards today, but are still challenged by closed platforms or low quality audio. Will SKAA rise as a viable alternative?

Executive Summary

Two dominant consumer wireless audio standards exist in the installed base today, Bluetooth and Apple's Airplay. In spite of their popularity, neither standard was developed to deliver minimal setup or high quality audio across a myriad of different products. SKAA is an alternative wireless audio standard that could challenge both Bluetooth and AirPlay. The two primary reasons for this are SKAA's focus on ease of connection, synchronized broadcast capability and quality of service. Moor Insights & Strategy is recommending that the consumer audio ecosystem take another look at the SKAA consumer wireless audio standard for their premium audio implementations.

Bluetooth

Bluetooth is an industry standard managed by the Bluetooth SIG which has 18,000 members. The wireless standard is a broad-based design with many uses in cars, exercise equipment, computers, consumer electronics, health and fitness devices, phones, tablets, and printers. The standard is extremely pervasive with the Bluetooth SIG announcing there are 2.5B end points since inception. Those aren't the amount of devices in use, but those devices that have been sold.

Because Bluetooth can carry very sensitive data, it requires pairing between devices. It can take up to five different steps to pair devices the first time. Once a device is paired the first time, it should stay in place for the next time, but as many have experienced, this connection is very unreliable. The unreliability is driven by interference from other 2.4 GHz devices, the lack of stringent QOS, and the pervasiveness of different silicon providers. Bluetooth is good enough for many applications, just not one that is great for every use, audio being one of those. High-quality audio doesn't require the same security a car or health monitor requires and a high-fidelity music experience is very peculiar about latency and bit-rate.

AirPlay

Airplay is Apple's proprietary standard designed to stream multimedia content, music, video, photos, and even mirror displays between Apple and Apple-licensed devices. AirPlay has a much higher QOS than Bluetooth for very obvious reasons. It has higher bandwidth as it sits on the back of WiFi, requires a very stringent Apple approval process, and silicon is limited to an extremely small number on the receiver side.

Airplay has downsides, too, particularly for music. It requires authentication, is limited to Apple devices or Apple-certified devices, and has latency challenges larger than Bluetooth because it is leveraging WiFi. It is also limited in the devices it supports. Airplay does not work with Android, Windows Phone, or Linux- based devices and only works with Windows PCs if the user is playing content through iTunes. Looking at the recent smartphone OS market share numbers out from [Gartner](#), this eliminates AirPlay from 75% of smartphone market.

Latency with AirPlay becomes an audio challenge too and is evident in many use cases where the user desires to play a game or watch a movie on their iPad tablet itself and listen to the audio wirelessly via speakers. The video and audio would be out of sync if this is done via AirPlay. Another use audio case Airplay isn't prepared for is a multi-speaker configuration, where multiple speakers are around the house with the desire to listen to the same song. With AirPlay, there is no guarantee the songs will be in sync.

SKAA

SKAA is a proprietary wireless audio standard developed, licensed and supported by [Eleven Engineering](#), designed especially for high-quality music. Operating at the 2.4 GHz spectrum, SKAA can provide a low latency solution at CD quality with a very minimalist pairing process. The user plugs a discrete micro-USB, USB, Apple 30 pin, and Apple Lightning dongle into their phone, tablet or PC and it immediately connects. There are no passcodes involved. QOS is guaranteed by a dual-core fixed function controller which Eleven Engineering calls the XInC. XInC provides what is called Walking Frequency Diversity (WFD), a narrow-band channel hopping strategy to avoid interference with other 2.4 GHz devices.

The basis for SKAA is a professional wireless audio standard called Pro Audio Wireless (PAW), used by many top music artists for wireless microphones and guitars. It is best exemplified by [Brace Audio's Digital Wireless Guitar 1000](#) used by the following bands: Justin Bieber, Lady Gaga, Keith Urban, Kanye West, Eminem Band, and Justin Timberlake. Eleven Engineering's wireless audio is also inside high-end prosumer wireless speakers and sub-woofers from Polk, Revel, Infinity and Harman.

SKAA, compared to Bluetooth and AirPlay, currently has a much lower number of partners and licensees. Additionally, the technology can be integrated into the client device, but today currently requires an external wireless transmitter.

Specification Comparison

	SKAA	Bluetooth (A2DP)	AirPlay Audio (WiFi)
Speakers / transmitter	4	1	10 ¹
Range	10-50m	3-10m	30-50m
Audio Reliability	High ²	Low ²	Low-Medium ²
Latency	40ms <i>locked</i>	120ms <i>typical</i>	2,000-3,000ms <i>typical</i>
Compatibility- OS			
iOS	Yes	Yes	Yes
Android	Yes	Yes	No
Windows	Yes	Yes	Limited ⁵
Mac	Yes	Yes	Yes
Linux	Yes	Maybe	No
Sound Quality	High 480Kbps CD-Quality	Low 201-329Kbps Sub-MP3	High 1.4Mbps CD-Quality
Pairing Process	Minimal	Required	Required
Battery Life³	20 hours	20 hours	10 hours
Network Requirement	No	No	Yes
Specific Use Cases⁴			
Gaming	Yes	Yes, poor	No
Movies	Yes	Yes, poor	No
Headphones	Yes	Yes	No
Mobile	Yes	Yes	No ⁶

1/ Different speakers may not be in sync due to latency differential. Wi-Fi router required.

2/ SKAA offers narrowband adaptive hopping and error correction. BT and AirPlay can suffer from 2.4 GHz interference from other WiFi, other BT, micro-wave ovens, cordless phones, etc.

3/ Tested on an iPhone 4 playing music. (via Eleven Engineering)

4/ Playing games or a watching a movie displaying on an iPad, iPhone, iPod and wirelessly broadcasting audio to speakers.

5/ iTunes only

6/ Airplay requires WiFi and a router.

Summary

Bluetooth and AirPlay are very pervasive standards that were designed for a very broad set of applications. As with all standards, the broader the coverage, more tradeoffs are required which, over time degrades acceptability to specific use cases. While history has shown the highest quality standard doesn't always "win", SKAA only needs to co-exist as it does today. Moor Insights & Strategy believes SKAA will gain acceptance with numerous speaker manufacturers, co-exist with Bluetooth and Airplay, and SKAA-based devices will be demanded by consumers who are looking for a higher quality home audio experience for music, videos, and games.

Photographs

Apple 30-Pin Wireless Transmitter



USB Wireless Transmitter



Sources

Apple Airplay: <http://www.apple.com/airplay/>

Apple AirPlay Support: <http://www.apple.com/support/appletv/airplay/>

Apple MFI Program: <https://developer.apple.com/programs/mfi/>

Bluetooth SIG, Inc.: <http://www.bluetooth.com/Pages/Bluetooth-Home.aspx>

Eleven Engineering, Inc.: <http://www.elevenengineering.com/home/>

SKAA: <http://www.skaa.com>

Author

[Patrick Moorhead](#), President & Principal Analyst at [Moor Insights & Strategy](#)

Inquiries

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