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> cs > arXiv:2202.08619

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**arXiv:2202.08619** (cs)

*[Submitted on 17 Feb 2022]*

# Alexa versus Alexa: Controlling Smart Speakers by Self-Issuing Voice Commands

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We present Alexa versus Alexa (AvA), a novel attack that leverages audio files containing voice commands and audio reproduction methods in an offensive fashion, to gain control of Amazon Echo devices for a prolonged amount of time. AvA leverages the fact that Alexa running on an Echo device correctly interprets voice commands originated from audio files even when they are played by the device itself -- i.e., it leverages a command self-issue vulnerability. Hence, AvA removes the necessity of having a rogue speaker in proximity of the victim's Echo, a constraint that many attacks share. With AvA, an attacker can self-issue any permissible command to Echo, controlling it on behalf of the legitimate user. We have verified that, via AvA, attackers can control smart appliances within the household, buy unwanted items, tamper linked calendars and eavesdrop on the user. We also discovered two additional Echo vulnerabilities, which we call Full Volume and Break Tag Chain. The Full Volume increases the self-issue command recognition rate, by doubling it on average, hence allowing attackers to perform additional self-issue commands. Break Tag Chain increases the time a skill can run without user interaction, from eight seconds to more than one hour, hence enabling attackers to setup realistic social engineering scenarios. By exploiting these vulnerabilities, the adversary can self-issue commands that are correctly executed 99% of the times and can keep control of the device for a prolonged amount of time. We reported these vulnerabilities to Amazon via their vulnerability research program, who rated them with a Medium severity score. Finally, to assess limitations of AvA on a larger scale, we provide the results of a survey performed on a study group of 18 users, and we show that most of the limitations against AvA are hardly used in practice.

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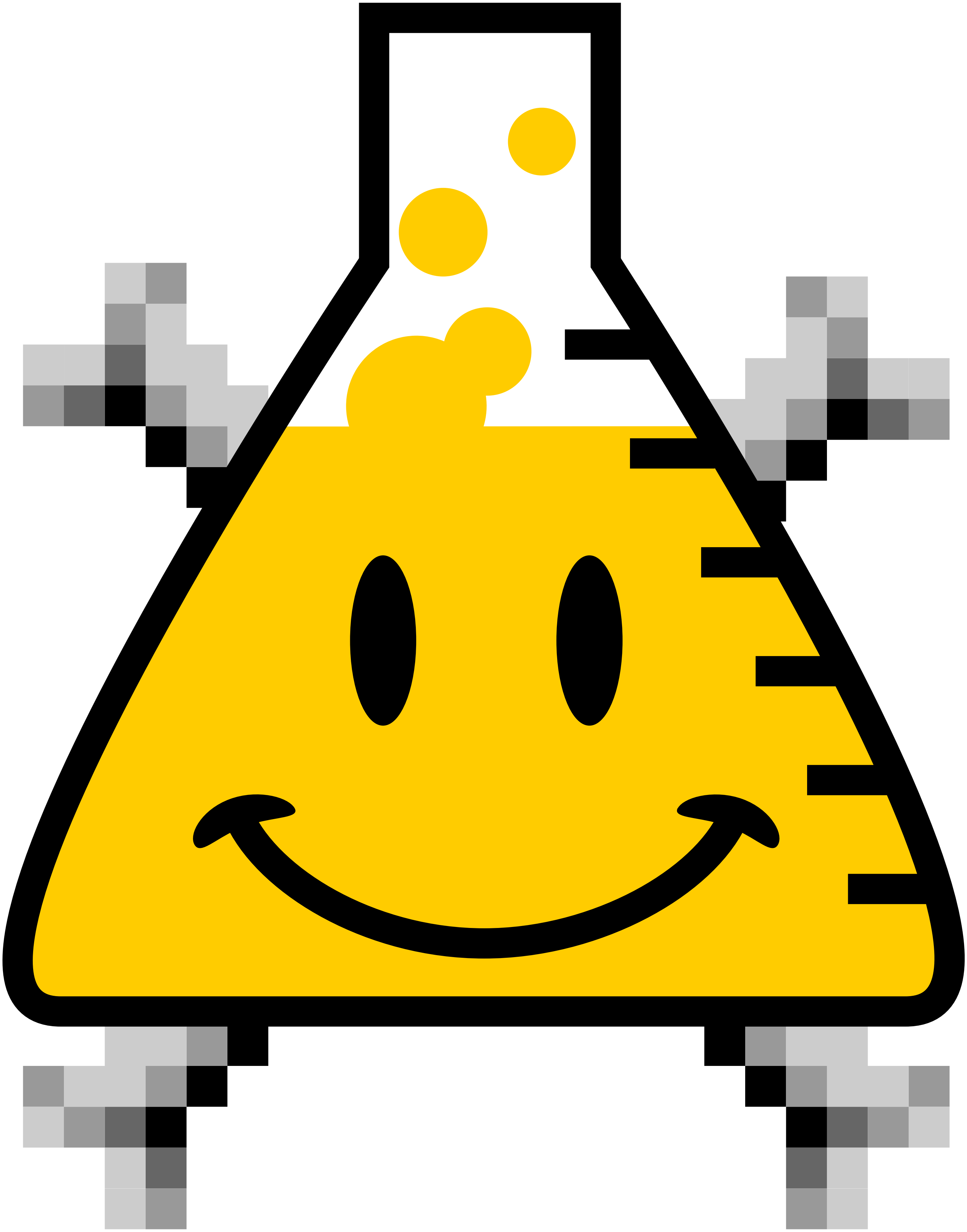

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