Navaratnasingam Arunanthy

Initial Post

71 days ago

4 replies

Last 55 days ago

The case study selected, Medical Implant, debates about an implantable heart health monitoring device with a potentially vulnerable hard-coded value. Based on a researcher's proof-of-concept, using the hard-coded value stored in the implant device, a nearby secondary device could alter commands sent to the implant to force the device to reset. However, the technical leaders from the organisation who industrialised the monitoring device consulted with the researcher and articulated the device's capabilities, which enabled the researcher to rate the risk of destruction with this attack as insignificant (ACM, n.d.).

This organisation worked with regulators from various countries to meet the regulatory requirements, aligning with the ACM Code of Ethics, principle 2.3 (ACM, 2018). Also, they did their part by implementing numerous measures such as cryptography and vulnerability disclosure that adheres to robust security goals. In addition, they also used the standard cryptographic algorithm for encryption, aligning with The Chartered Institute for IT (BCS) code of conduct (BCS, n.d.). This establishment also works with charity organisations to enable vulnerable people to access these devices, whose financial condition may have prevented them from accessing, demonstrating their commitment to society and human well-being, aligning with the ACM Code of Ethics, principle 1.1 (ACM, 2018). Additionally, the organisation leaders responded timely and responsibly to determine the issue's magnitude to manage the risk once a possible vulnerability was discovered, demonstrating their commitment to comply with the BCS code of conduct (BCS, n.d.).

References:

ACM (2018) ACM Code of Ethics and Professional Conduct. Available from: https://www.acm.org/code-of-ethics#h-2.3-know-and-respect-existing-rules-pertaining-to-professional-work [Accessed 25 January 2022].

ACM (N.D.) Case: Medical Implant Risk Analysis. Available from https://ethics.acm.org/code-of-ethics/using-the-code/case-medical-implant-risk-analysis/ [Accessed 25 January 2022].

BCS (2021) Code of Conduct for BCS Members. Available from: https://www.bcs.org/media/2211/bcs-code-of-conduct.pdf [Accessed 25 January 2022].

Reply

Post by **Spiros Anagnostopoulos**
peer response

67 days ago

I find Arun's case study intriguing and controversial, given the importance of the asset at stake (human life).

Drawing on my experience from a previous module (the Medical Mannequin case study), I believe that medical implants' security should be examined considering these devices' unique constraints and in a way that targets to strike a balance between security, safety and availability (Altawy & Youssef, 2016).

In other words, extreme security measures (even if limitations could be overcome) turn out to become a threat itself in case of an emergency, where the patient's device needs urgent access from medical staff that could be different from the patient's doctor. In case the device remained secure but not accessible, not only the company would fail to comply with the ACM Code of Ethics, principle 1.1 and principle 2.5 (ACM, 2018), but the company could be prosecuted for causing human demise.

Given that this discussion is not so security-oriented and aims to point out the ethical part and the code of conduct compliance, I agree more with Arun's analysis that the company is on the right track in terms of ethics. However, besides the bug bounty program, additional and continuous research is needed to perform better in principle 2.9 (Design and implement robustly and usably secure).

References:

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Altawy, R. & Youssef, A.M. (2016) Security Tradeoffs in Cyber Physical Systems: A Case Study Survey on Implantable Medical Devices. *IEEE Access*, 4, pp.959–979. Available from: https://doi.org/10.1109/ACCESS.2016.2521727.

Glisson, W.B., Mcdonald, T., Campbell, M., Andel, T., Jacobs, M. & Mayr, J. (2014) Compromising a Medical Mannequin. (2012), pp.1–11.

Reply

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