**8-1 Journal: Software Requirements Engineering**

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**Reverse Engineering IoT**

Reverse engineering can improve cloud-based IT systems by enhancing security, integration, and optimization. With reverse engineering, engineers can deconstruct the system and identify potential vulnerabilities to mitigate attackers from exploiting the system. Having a cloud system means interacting with multitudes of applications and services. Using reverse engineering will enable systems to function and ensure integration with different cloud components is possible. Lastly, optimization allows the system to have the most effect with the provided resources. Analyzing cloud functionalities will enable engineers to identify areas for improvement and develop better performances.

**Patching**

It is possible to use reverse engineering to patch cloud-based IT systems by focusing on patch development and deployment. Patch development involves changing a code to fix bugs, improve functionality, or update software. When focusing on a cloud system’s code, engineers can identify potential weaknesses in the internal workings and address the issue to fix flaws and prevent attackers from exploiting the system. Similarly, patch deployment focuses on similar aspects but only on a created patch. Applying patch deployment strengthens the entire security system by modifying existing codes or reconfiguring functionalities.

**Vulnerability**

Many IoT devices are already infected with malware and other vulnerabilities because of their weak built-in security or user behavior. Many products focus solely on functionality or affordability, causing security features to be lacking. In doing so, many products have weak encryptions or limited software updates that enable attackers to hack the system quickly. Suppose a user needs to be more knowledgeable in technology and aware of the security risks of the product. In this case, if the user does not use a strong password and changes it frequently while updating software once it is released, it has the same effect of attackers being about to exploit the system due to the user’s behavior.

**Impact**

Reverse engineering can impact new IT technology by enhancing security. It identifies vulnerabilities in IoT device firmware and cloud systems, leading to the creation or improvement of patching. Finding weaknesses impacts IT technology to improve overall security and mitigate the chances of attackers exploiting devices and systems.

**Future**

A new technology that already uses reverse engineering is Machine Learning (ML) algorithm analysis. Besides finding vulnerabilities, using reverse engineering with ML allows engineers to innovate more with their decision-making methodology. Focusing on the ML algorithm analysis also helps to improve the understanding of the inner workings of existing algorithms to become better and more efficient.