Bridging the Gap for Real-Time Locating Functionality: Application of *Medigate* Data to Locate Devices

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I. Abstract

With cybersecurity risk management becoming a priority for many health delivery organizations, a significant need for accuracy in medical device asset records has emerged. In order to address this gap, the application of automated networked asset discovery tools have become increasingly popular[1]. These tools function to provide visibility on how devices communicate on the network; device-specific attributes such as MAC, IP, or software version can be automatically populated in the organization's computerized maintenance management system (CMMS). Similarly, network connection details for these devices, such as system uptime or the last access point connected to, are also collected. As such, network connectivity details could be leveraged in physically locating devices. Dedicated real-time locating systems (RTLS) commonly serve this purpose in hospitals to locate patients or items of interest, frequently making use of existing hospital wireless network infrastructure[2,3]. While highly accurate, a dedicated RTLS system requires the installation of a tag to track an object, deployment of a system server, and the allocation of funds to pay an annual subscription cost[3]. If a high level of accuracy is not needed, this case study serves to evaluate the viability of applying an existing automated networked asset discovery system to provide 'low fidelity' location data for the purposes of asset management.

Interior Health Authority (IHA) recently purchased an automated networked asset discovery tool known as *Medigate*, in response to a number of cybersecurity recommendations made by the BC Auditor General[1]. This system has been integrated with *Cisco DNA Spaces* software used to map wireless access point (AP) information, allowing IHA Biomedical Engineering (BME) staff to locate wireless-enabled medical devices on a map, based on what AP they last connected to. After this integration had been implemented, several BME supervisors and technologists were granted access to the platform, with the intent of using the location data to find devices in need of maintenance or repair.

Feedback on the efficacy of this system was collected via a survey distributed to the BME supervisors and technologists given access to the platform. Initial feedback has been positive, with technologists appreciating how this tool reduces the amount of time spent trying to locate infusion pumps. This time savings was noted to be 'extensive' when multiple wireless devices were simultaneously due for maintenance. While generally positive, some limitations of the system were noted. If a device is turned off and then moved, the 'last known location' information will not be correct and could introduce a hurdle in locating the device. Additionally, due to the reliance on location data being provided by a single wireless access point, as opposed to triangulated data from a true RTLS system, device location data is accurate, but not precise.

Preliminary feedback on this *Medigate* integration has shown great potential thus far. While location data may not be precise, the tool is useful in narrowing down where a device may be, or if it may have travelled between sites. Furthermore, due to the reliance of this system on already-implemented infrastructure, the deployment of this system across all IHA sites was immediate; conventional RTLS systems are limited to the specific site in which they are deployed. Lastly, dedicated RTLS tags are visible within *Medigate*, so devices that are not wireless-capable (such as beds and stretchers), could potentially be tagged and located. While currently explorative, IHA foresees long-term value in improving maintenance interval compliance and reduction of 'lost' devices across the sites in our health region.

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