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Evaluating the Total Costs of a Ransomware-Resilient Architecture for Healthcare Systems

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Abstract : This paper is based on our previous work that proposed a risk-transference-based architecture for healthcare systems to store sensitive data outside the system boundary, rendering the system unattractive to would-be bad actors. This architecture also allows a compromised system to be abandoned and a new system instance spun up in place to ensure business continuity without paying a ransom or engaging with a bad actor. This paper delves into the details of various attacks we simulated against the prototype system. In the paper, we discuss at length the time and computational costs associated with storing and retrieving data in the prototype system, abandoning a compromised system, and setting up a new instance with existing data. Lastly, we simulate some analytical workloads over the data stored in our specialized data storage system and discuss the time and computational costs associated with running analytics over data in a specialized storage system outside the system boundary. In summary, this paper discusses the total costs of data storage, access, and analytics incurred with the proposed architecture.

Keywords : cybersecurity, healthcare, ransomware, resilience, risk transference
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