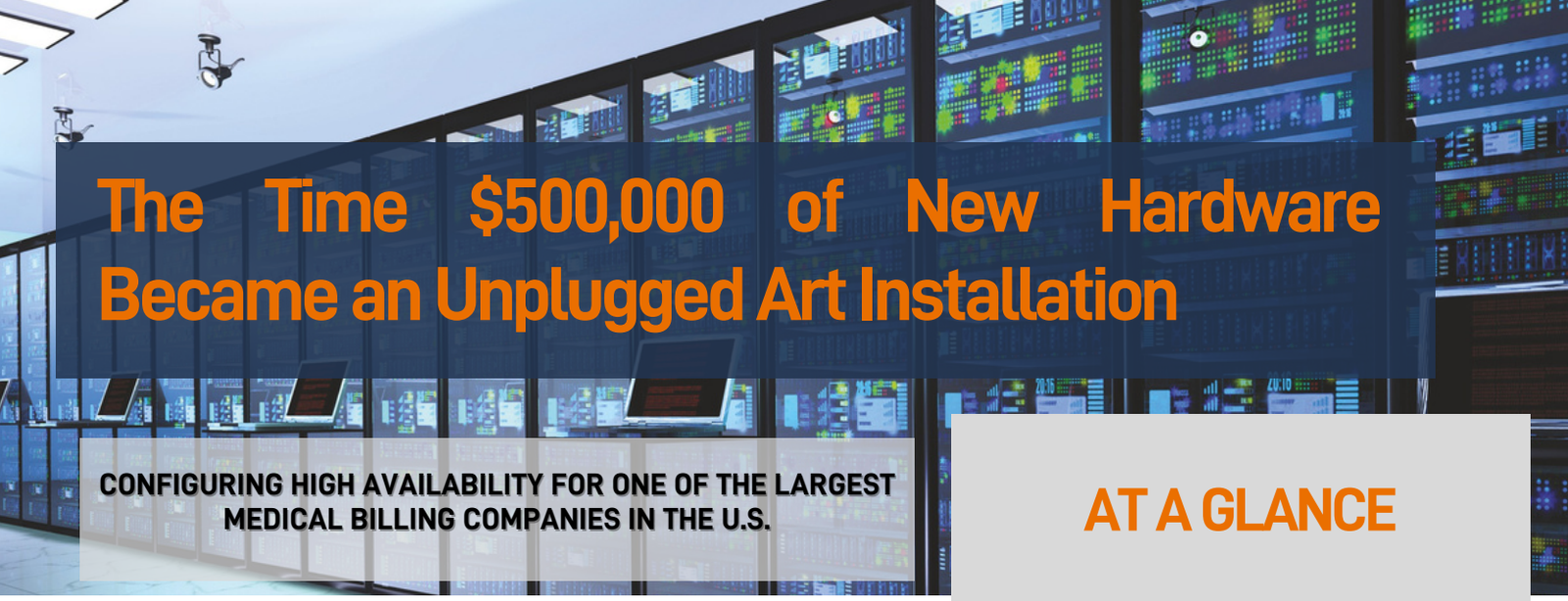

# The Time $500,000 of New Hardware Became an Unplugged Art Installation

**CONFIGURING HIGH AVAILABILITY FOR ONE OF THE LARGEST MEDICAL BILLING COMPANIES IN THE U.S.**

## AT A GLANCE

- 680+ Virtual Machines
- 8 Petabytes of storage
- 99.99% Uptime reached
- 50% Increase in application speed
- 1,500% Increase in servers

## INTRODUCTION

One of the largest billing companies in the United States had recently invested half a million dollars in new server equipment. Just as they started migrating their biggest customer to the new system, everything crashed, and their business was at risk. Fortunately, Protected Harbors' CEO Richard Luna was on-site at that time for a review with the entire 20-person in-house IT team, regarding another data networking problem that he solved a couple days prior. Panic ensued throughout the client's conference room as their reputation was on the line and they could see potentially significant financial losses. The company's current IT team was unable to diagnose the cause of this and they could not provide the swift recovery services they needed, thus losing the confidence of the company.

## THE PROBLEM

Richard could not stand by and watch the ship go down. Although they were not an official client, Richard asked the company's CEO if he could step in and help. The future client happily agreed. Richard initiated an emergency deep dive with the IT team, and within an hour developed an action plan. Richard diagnosed that the software configuration was misaligned with the hardware. The legacy systems were overloaded without any effective monitoring or regular backups. The servers and storage were simply maxed out. The current design had the database server, remote connection server, and application server all running in a single virtual machine. If the database server needed 90% of the CPU (Central Processing Unit) to execute a task, there was not enough bandwidth to keep the other services up leaving the customers to crash. If the remote server needed to be rebooted, the database and application servers would also have to be rebooted, causing the entire system to go down.

"I am glad you all followed the first rule of resolving an IT problem; panic. Nothing produces panic faster than an outage. Now that we are panicked let's focus on what on solving the issue. What is currently good and working?"

**Richard Luna**
**CEO, Protected Harbor**

PROTECTED HARBOR

## THE SITUATION

Richard put together a two-part plan: reconfigure the design and upgrade the hardware. The next day at 4AM, Richard presented the client with 3 hardware options each with unique features and prices. After having a meeting with the client, three hours later, it was decided that the company would order the new top-of-the-line hardware option, only if Richard and Protected Harbor would help design, deploy, and manage the new setup. A new relationship was born.

## THE SOLUTIONS

1. **Rapid Diagnostic & Repair:** Protected Harbor was able to initiate a quick discovery and rapid response based on company standards they have drafted for past clients. By testing and eliminating entire groups of functions, they were able to eliminate possibilities and narrow down the issues quicker.

2. **Software Supported Equipment:** One of the core reasons why the equipment malfunctioned was because the installed equipment was not in line with the software ecosystem the client operated on. Hence, it was necessary to identify and install the right equipment to support the client's software that was both reliable and durable.

3. **Hardware High Availability:** It was necessary to have a fail-safe in place to ensure system uptime even in the event of a failure. The team introduced High Availability for the virtual servers by building a failover cluster using state-of-the-art software-defined storage technology. Therefore, adding durability and reliability to the client's infrastructure.

4. **Recovery & Downtime:** Protected Harbor designed and implemented a High Availability configuration at the application layer. In the event of a virtual server malfunction, other virtual servers could continue serving the application. This resulted in a much more secure ecosystem, improved server performance, improved database functions, and reduced dependability.

5. **Remote Application Protocol (RAP):** The current setup was a mix of full desktop servers and remote application terminals that allowed customers unrestricted to access the database server. Those customers would eventually make a mistake within the database and the application would break, causing the system to crash. Richard put his new client into a RAP environment, where customers would log into a terminal server to access the app and pass through a restricted gateway to access the database. This essentially made them a RAP app sitting on a pool of 8 terminal servers all linked on multiple database servers.

## THE RESULT

The new hardware infrastructure increased the reliability, and durability of their services. Their services and reputation grew, allowing the client to go from four to 60 severs in their Data Center since Fall 2018. They now hold 1.8 petabytes of data storage across 680+ virtual machines (VM) with unlimited bandwidth allocation and no metering on egress or ingress. Moreover, their application speed increased 50% and their uptime reached 99.99%. As for the client's largest customer, their business increased by an enormous 500%. They grew from two database servers to 22 database servers, with 49 dedicated VM. They have not experienced a critical outage since Protected Harbor began managing the client's database.