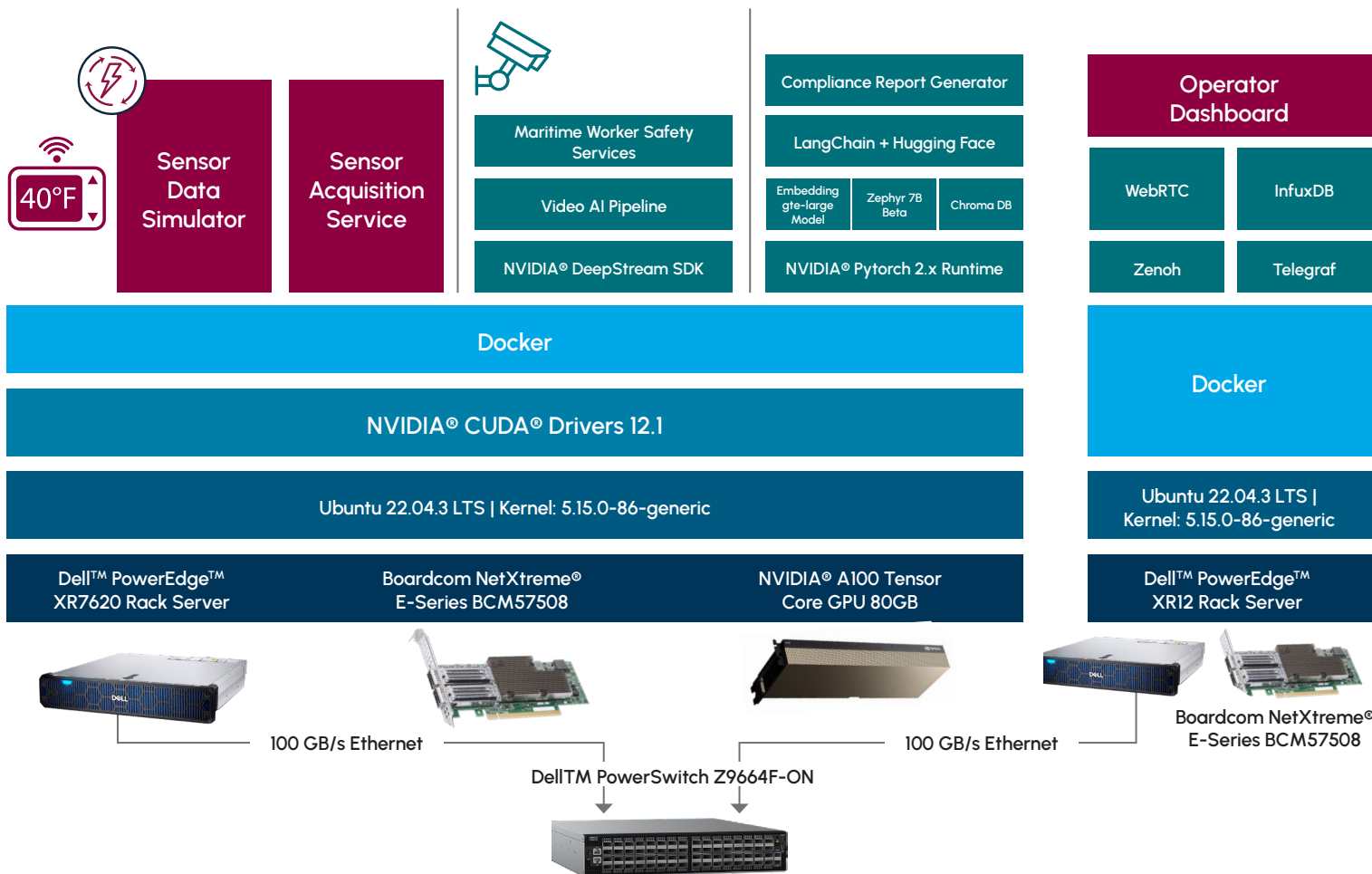


Transportation Solution Overview

Built on Dell™ and Broadcom™ hardware, this proof-of-concept solution showcases a real-world AI application for maritime environments that could additionally be adapted to other transportation and logistics use cases. The solution captures sensor data from both refrigerated and dry cargo containers to monitor for issues with temperature changes, power usage, and cargo sweat. The solution additionally deploys an image detection model to capture workers entering hazardous cargo zones from on-board video streams. The captured data is presented in a visualization and alerting dashboard and additionally used in an LLM generated end of voyage report.



Edge Based Deployment

The maritime cargo monitoring PoC overcomes the challenge of deploying AI at the edge by utilizing Dell PowerEdge XR7620 servers featuring a compact, ruggedized chassis and powerful NVIDIA™ GPUs.

Customized AI Solution Using Zephyr 7B and RAG

To create an AI generated end of voyage report, the PoC solution uses the Zephyr 7B model. Zephyr 7B is a distilled model that is as powerful as much larger models, making it ideal for edge deployments with limited resources. While Zephyr 7B is a general-purpose language model, the PoC demonstrates customization of a readily available model with specific context using Retrieval Augmented Generation (RAG).

High Bandwidth Connectivity

The use of scalable Broadcom NICs provides high bandwidth Ethernet connectivity between Dell PowerEdge servers. The high bandwidth connectivity proves critical in communicating cargo and worker safety alerts that require timely action.

Rapid Report Generation

Testing of the PoC demonstrated end of voyage report generation in as little as 46 seconds. This use of AI rapidly accelerates an otherwise time-consuming process, providing quicker reporting for compliance purposes.

Additional information about the PoC, including sample code and performance results, has been made available by Dell on [GitHub](#).