Edge Computing: A Driving Force in the Transformation of One of the World's Largest Shipping Companies

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Industry Overview

The shift to edge computing is revolutionizing the way goods are moved, tracked, and managed. Shipping and logistics companies are increasingly turning to edge computing providers to transform their operations, enabling real-time insights and decision-making, and delivering a more seamless customer experience. This distributed computing paradigm is bringing computation and data storage closer to distributed shipping containers where it's most needed, and providing several benefits, including:

- **Reduced latency**: By processing and analyzing data at the edge, shipping and logistics companies can make decisions faster and more reliably. This is particularly critical for real-time tracking and monitoring of shipments.

- **Improved efficiency**: Edge computing can help shipping and logistics companies optimize their operations by providing real-time insights into their data. This can help them identify and resolve problems more quickly, make better decisions about resource allocation, and improve customer communications and services.

- **Improved connectivity:** Edge computing orchestration and management accounts for the frequent intermittent network connectivity common in remote locations with enhanced wireless connectivity that keeps vessels online.

- **Reduced costs:** Shipping and logistics companies can reduce their IT costs by reducing the amount of data that must be transmitted to the cloud before it reaches the edge where the data is truly needed.

Customer Background

ZEDEDA's customer is a shipping and logistics company operating globally. Since its founding, the company has grown to become one of the largest container shipping companies in the world, encompassing a wide range of services, including container shipping, terminal operations, oil and gas exploration, and logistics solutions. Impacted by supply chain disruptions common in this industry, the shipping leader recently began implementing private 5G networks, thousands of IoT devices, and an edge computing foundation to increase the quality, efficiency, and visibility of its container ships used to transport cargo overseas.

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Opportunity

As one of the largest container shipping companies in the world, the company moves 12 million containers every year, delivering to every corner of the globe, and, since 2012, has maintained 2G mobile connectivity via satellite across its vessel fleet. This local wireless network is responsible for everything from mobile network access for operator cell phones to vessel interaction, vessel fleet management and troubleshooting, and customer communications. Responding to the need for bigger throughput capacity, as well as enhanced operational efficiency, faster delivery speed, and improved reliability, the transportation and logistics services company recently launched a wireless overhaul project, which will include an upgrade and re-equipping of its vessel infrastructure from 2G to 4G.

The company's vessel connectivity is currently provided by satellite, but it pledges to deploy high-speed satellite internet connectivity of up to 200 Mbps to 330+ of its owned and operated container vessels by Q1 2024. The shipping company's vessel connectivity is currently terminated on an SD-WAN device, which is currently located in front of a ZEDEDA-powered platform. Today, the use case is deploying an IOT packet core solution, but collapsing the SD-WAN is a potential next step.

Solution

One of the shipping company's main objectives is standardizing the deployment of a Kubernetes-based packet core infrastructure application on its vessels. Deployed as a single virtual machine, consisting of a Kubernetes cluster with a containerized app, this application has been designed to handle a variety of shipping logistics IoT use cases and connected device strategies.

The container shipping company's second and third objective includes ensuring nodes are secure and vessels suffer little to no downtime.

Additional deliverables include:

- Security management of the servers on the vessels, including secure comms, encryption for data at rest, hardware-based identity, etc.

- Lifecycle management of the application

- Intermittent connectivity solution

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Industry Impact & Conclusion

Mobile connectivity is a constant area of concern in the deployment and management of IT applications and infrastructure in the shipping and logistics industry, particularly in ocean transport. These challenges highlight the need for reliable network connectivity at the edge, as well as the need for flexibility in the size of nodes that can be deployed, independent of server size. Another concern is how quickly applications must be installed, tested, verified, and updated while at sea, often with limited and inflexible time between ports. This challenge underscores the need for a standardized and automated deployment and maintenance process.

ZEDEDA's edge orchestration and management platform is a good fit for any transportation use case that shares these properties.

Want to Learn More?

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About ZEDEDA
ZEDEDA makes edge computing effortless, open, and intrinsically secure – extending the cloud experience to the edge. ZEDEDA reduces the cost of managing and orchestrating distributed edge infrastructure, while increasing visibility, security and control.

ZEDEDA ensures extensibility and flexibility by leveraging a partner ecosystem, and EVE-OS, open-source Linux-based edge operating system.