

## **Performance Comparison of Dell PowerEdge MX760c and MX750c Server Models**

Executive summary

In today's fast-moving world, companies must continuously evolve to stay competitive and relevant in their industry. They need to prepare for uncertainty, reacting quickly to sudden change. To meet these demands, innovative organizations are turning to data-fueled workloads such as artificial intelligence and Internet of Things to help them dynamically respond. But first, they need to ensure that their data centers are up to the challenge. Because transformational workloads have different hardware requirements, they need a modernized, dynamic infrastructure to be successful.

**To meet the need for flexibility and agility, Dell Technologies Inc. introduced a modular, integrated solution designed for disaggregated data center infrastructure — PowerEdge MX.**

The Grid Dynamics team tested the performance of the newest addition to the PowerEdge MX kinetic ecosystem — the Dell PowerEdge MX760c Compute Sled — to check what it has to offer to the market. We took recommendation systems, anomaly detections, and other optimizations as use cases for evaluating the server's performance.

To better evaluate the MX760c server, the Grid Dynamics team compared its performance to a previous generation server from the same model line — Dell PowerEdge MX750c.

## Dell PowerEdge MX760c Compute Sled



**32.4% faster**

when performing machine learning tasks



**448% more  
CPU performance  
per dollar**

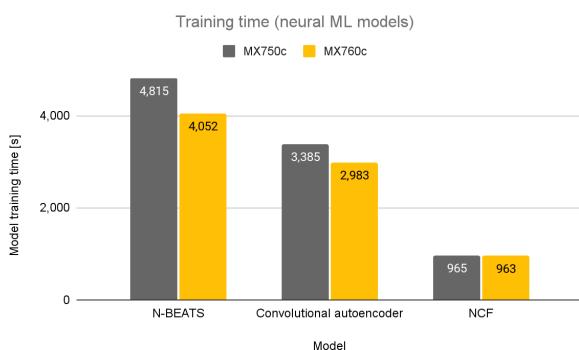
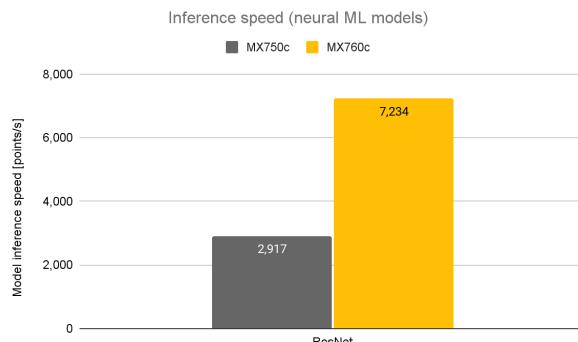
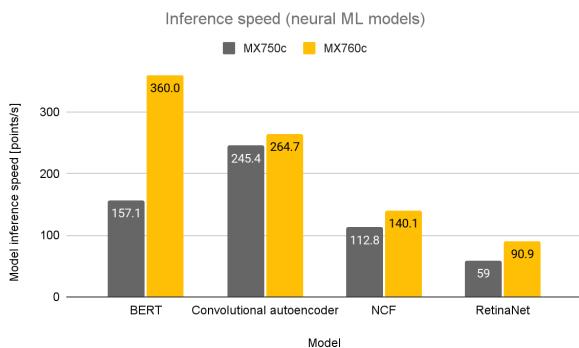
for machine learning tasks

## Trust the numbers: Dell PowerEdge MX760c performs better when solving machine learning tasks

To understand how the MX760c model series handle significant artificial intelligence/machine learning workloads as compared to the MX750c model series, we developed four use cases that simulate the computational needs of retail, industrial, and related IT infrastructure:

1. **Recommendation system** for analyzing user preferences and creating personalized recommendations.
2. **Sales forecasting and inventory decision support tool for store managers** for keeping the inventory optimized against actual and forecasted demand as well as planning the stock replenishment.
3. **Anomaly detection for industrial timeseries** for analyzing anomalies in telemetry data and detecting failure probability in industrial hardware.
4. **Popular machine learning benchmarks** for evaluating the server performance through a series of standardized tests.

We concluded that **Dell PowerEdge MX760c** – leveraging Intel® Xeon® Gold 6430 CPUs that cost around \$2,128.00 per unit – **performs better** in machine learning **than MX750c** leveraging Intel® Xeon® Platinum 8368 CPUs that cost around \$7,214.00 per unit. Additionally, Intel® Xeon® Gold 6430 supports the **Advanced Matrix Extensions** accelerator that improves the performance of deep-learning training and inference.



**9% less\*** time to train neural ML models

**73% faster\*** inference for neural ML models

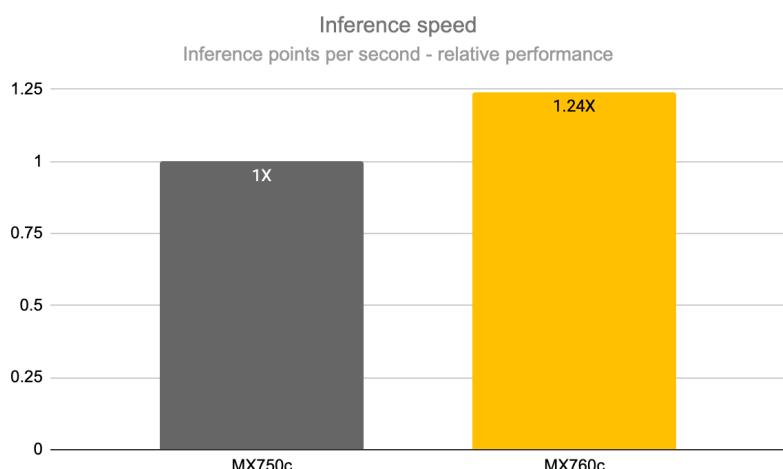
\*Average, compared to Dell PowerEdge MX750c.

## Use case 1: Recommendation system

This use case demonstrates prediction of products that particular customers may like based on their past ratings and preferences. Implementing a recommendation system helps retailers offer a personalized shopping experience and increase revenue.



**The same\* amount of time to train the machine learning model**



**24% faster\*** inference for the machine learning model

\*Average, compared to Dell PowerEdge MX750c.

## Use case 2: Sales forecasting and inventory decision support tool for store managers

This use case demonstrates the local adjustments for inventory plans for a particular store compared to the central corporate system forecasts. Doing the what-if analysis helps retailers track and adjust stocks against the demand curve as well as plan seasonal challenges ahead. The maximum acceptable difference between demand volume and the corporate system's forecast can be set during the analysis.

Use case 2 simulates in-store sales and replenishment process with regard to adjusting the inventory and store assortment.

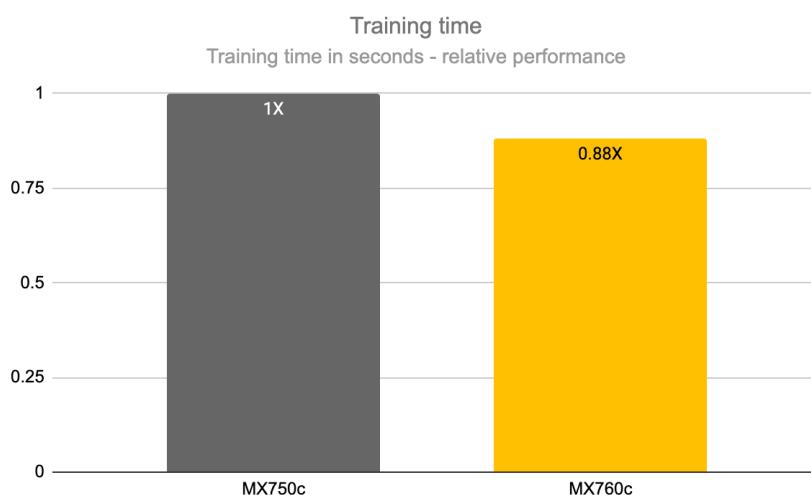


**16% less\*** time to train the machine learning model

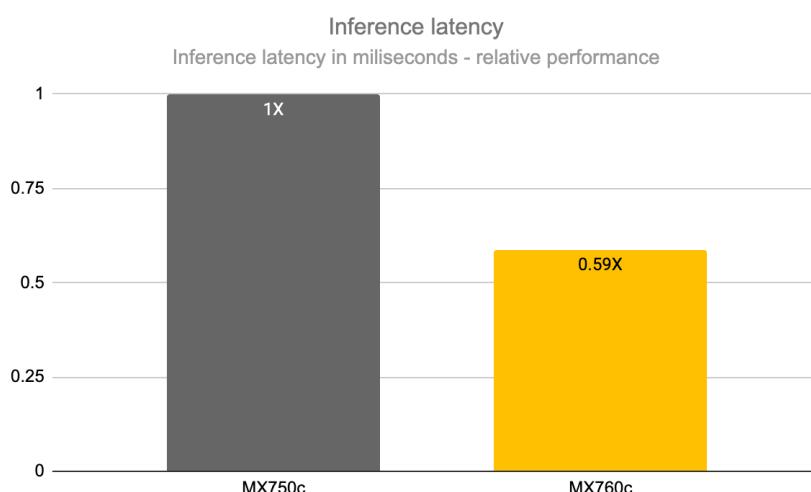
\*Average, compared to Dell PowerEdge MX750c.

## Use case 3: Anomaly detection for industrial time series

This use case demonstrates real-time analysis of anomalous activity in telemetry data from industrial hardware, such as wind turbines or city water pumps. Analysis of anomalies helps detect the probability of hardware failure and take the necessary steps to prevent it.



**12% less\*** time to train the machine learning model

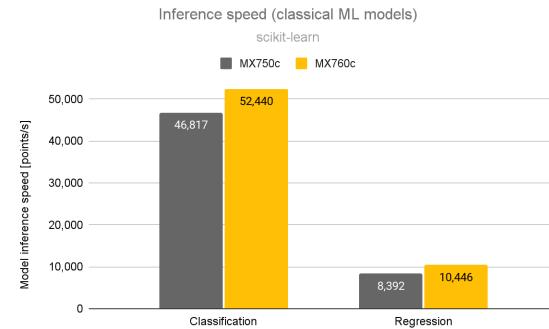
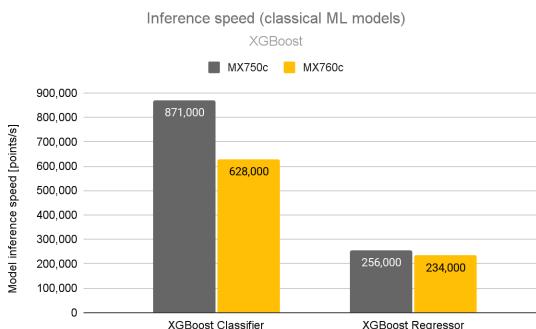
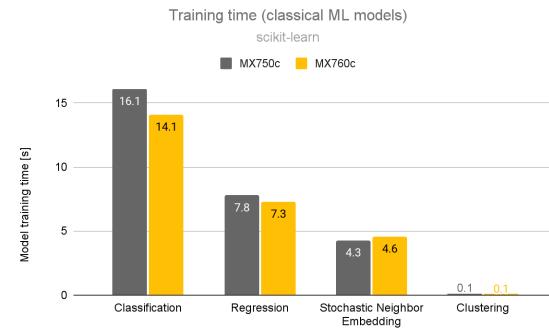
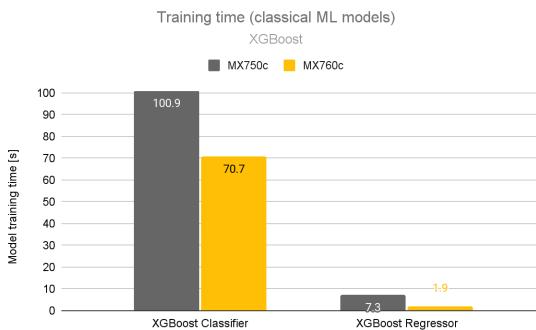


**41% less\*** inference latency

\*Average, compared to Dell PowerEdge MX750c.

## Use case 4: Popular machine learning benchmarks

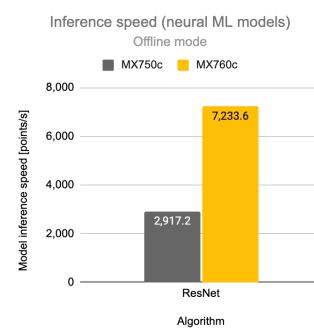
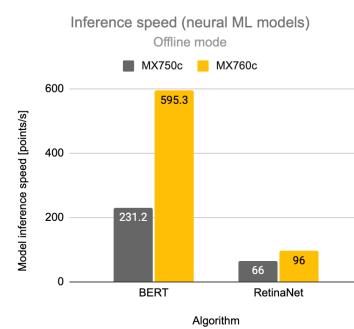
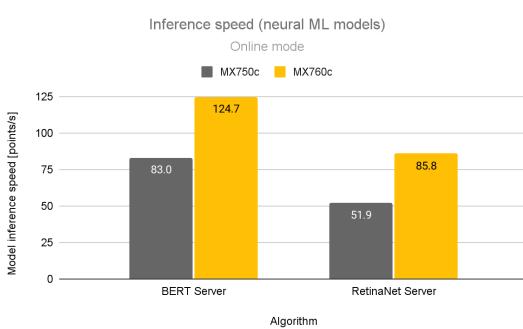
This use case demonstrates measurement of server performance with a set of standardized benchmarks developed by the machine learning community.



**20% less\*** time to train classical ML models

The **same\*** inference speed for classical ML models

**114% faster\*** inference for neural ML models



\*Average, compared to Dell PowerEdge MX750c.

**Try it first: Testing newer servers helps you see if they are a good fit for your business use cases.**

## Proof in performance.

### About Dell PowerEdge MX760c

- Highly configurable
- Supports the latest computing technologies
- Supports up to two 4th generation Intel® Xeon® Scalable Processors with up to 56 cores per socket for faster performance
- Supports higher-speed and dense memory capacity, optimized for 2 DIMMs/channel and up to 32 DDR5 DIMMs at 4800 MT/s
- Storage options include increased storage density with E3.S EDSFF NVME Gen 5 devices, and up to 64 E3.S devices total per chassis
- Introduces the 100G switch with simplified common management

## Summary

The performance testing on significant amounts of data in diverse use cases validates that Dell PowerEdge MX760c handles large amounts of operational, AI-related workload as well as performs exceptionally well for typical retail, industrial, and business needs.

Optimized computing power combined with high-performance direct attached storage allows you to capture high quality data and analyze it locally to gain insights into your business.

New Intel® Xeon® Scalable Processors and DDR5 memory make it possible for Dell PowerEdge MX760c to be effective in training and inference tasks for small and medium-sized machine learning models (up to ten million parameters) and to be a good solution for running larger models (with hundreds of millions of parameters) effectively in inference mode.



Dell PowerEdge MX760c Compute Sled

## About Grid Dynamics

Grid Dynamics is a digital-native technology services provider that accelerates growth and bolsters competitive advantage for Fortune 1000 companies. Grid Dynamics provides digital transformation consulting and implementation services in omnichannel customer experience, big data analytics, search, artificial intelligence, cloud migration, and application modernization. Grid Dynamics achieves high speed-to-market, quality, and efficiency by using technology accelerators, an agile delivery culture, and its pool of global engineering talent.

We work in close collaboration with our clients on digital transformation initiatives that span strategy consulting, early prototypes, and enterprise-scale delivery of new digital platforms. We help organizations become more agile and create innovative digital products and experiences using deep expertise in emerging technology, top global engineering talent, lean software development practices, and high-performance product culture.

Headquartered in Silicon Valley with over 1,300 technologists located in engineering delivery centers throughout the US, Central, and Eastern Europe, Grid Dynamics has architected and delivered some of the most extensive digital transformation programs in the retail, technology and financial sectors to help its clients win market share, shorten time to market and reduce costs of digital operations on a massive scale.

In 2019, Forrester named Grid Dynamics a leader among midsize agile development service providers. In 2020, Grid Dynamics went public and is trading on the NASDAQ under the GDYN ticker.



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