

eCommerce

- Intel® Xeon® Scalable processors
- Intel Virtualization Technology (Intel® VT)
- The Intel® Math Kernel Library for Deep Neural Networks (Intel® MKL-DNN)
- Intel Optimized TensorFlow
- Intel DL Boost - VNNI

Making Tokopedia the e-Commerce champion

Intel Xeon Scalable Processor and Google Cloud enable Tokopedia to provide streaming video transaction facilities for its merchants & buyers



Background

Like many regions around the world, Southeast Asia experienced an eCommerce boom in the last two to three years, as various pandemic-driven social lockdowns encouraged more shopping from home. Based on data from [eMarketer](https://www.emarketer.com), a market research firm from New York, total retail eCommerce sales in the six countries in South-East Asia (Indonesia, Thailand, Malaysia, Vietnam, Singapore, and the Philippines) reached \$45.07 billion in 2021. Indonesia leads the pack with \$ 20.21 billion to confirm that Southeast Asia's e-commerce market is indeed growing.¹

Against this backdrop, Intel is committed to supporting the development of the eCommerce industry in South-East Asia, including in Indonesia. Intel has seen that gradually, more eCommerce companies across South-East Asia are taking advantage of new business opportunities created by the four "superpowers": cloud, connectivity fueled by 5G, artificial intelligence (AI) and the intelligent edge. These technologies allow business founders to reach new markets and customers, to offer new services that were unimaginable before.

Digital technology is transforming the world at an accelerated pace and technology leader, Intel is in a unique position to accelerate the development of the eCommerce industry across the region, not only with its products and technologies, but also by having strategic alliances with second-to-none entities, such as Google Cloud.

One of the notable success stories about the implementation of Intel and Google Cloud technologies to the leading eCommerce company is the story of Tokopedia.

Tokopedia understands its eCommerce business depends on technology support and a reliable network. Therefore, when these two aspects are maximized, Tokopedia is able to serve its million users and merchants across the world's largest archipelago Indonesia, and even become Indonesia's [most visited](#) eCommerce website.²

¹ <https://www.emarketer.com/content/southeast-asia-e-commerce-2021-public-health-uncertainty-clouds-outlook>

² <https://www.thejakartapost.com/paper/2021/09/24/tokopedia-passes-shopee-as-indonesias-most-visited-e-commerce-website.html>

Challenge

Tokopedia's creative team creates opportunities for merchants to sell their products to Tokopedia buyers. These events generate an increase in visitors and transactions during certain promo periods. It certainly puts pressure on the user experience of their home-grown leading eCommerce marketplace.

Widjanarko Eko Djatmiko Adi, Head of Engineering, Tokopedia, said, "We once had issues with scalability and reliability to deliver uninterrupted service to buyers and merchants every time there's an increase in website visitors and transactions, but this is a good problem for us to solve. This phenomenon will magnify our business, as well as place our leadership position even more firmly in the eCommerce industry sector in Indonesia. Hence, we rely on technology support to make sure that we can take the user experiences to the next level, every time.

For example, Tokopedia's live shopping platform, Tokopedia Play, could only support tens of thousands concurrent users. Whereas it should be able to support millions of concurrent users to maximize the benefits both for merchants and buyers. In fact, the system should be able to support the uniqueness of the sales system, for example, when there is a certain program that encourages users to open the Tokopedia Play application on their mobile phone and shake it to win a prize.

"Tokopedia Play is a live streaming and live shopping platform on Tokopedia where users can find great live shopping content,



// We rely on technology support to make sure that we can take the user experiences to the next level, every time. //

// We work with Google Cloud running on Intel® Xeon® to manage Tokopedia Play. //

Widjanarko Eko Djatmiko Adi
Head of Engineering, Tokopedia



Tokopedia is Indonesia's most visited eCommerce website

product reviews, and live deals. The platform allows sellers to create live video streams or upload video content to promote their products and connect with their potential buyers. We inspire and engage buyers through our contents. On the platform (Google Cloud and Intel Technology), buyers can browse through a selection of videos relevant to their interest, watch the promoted products, engage sellers and make purchase decisions," Mr. Widjanarko added.

Simultaneously, Tokopedia must be able to collect and process data quickly and precisely so that buyers and merchants can get the maximum benefit by transacting through the platform.

Solution

The Tokopedia IT department evaluated many options and after long consideration and trial phase, Tokopedia chose Google Cloud running on Intel® Xeon® Scalable processor-based servers as one of their cloud partners and began modernizing and moving applications to Google Cloud. "We are using well-adopted video streaming technologies. We adopt the multi-cloud approach, to avoid vendor locking and be cost-effective: to maximize the solutions while being financially optimized. We work with Google Cloud running on Intel Xeon to host our Content Creation tools, Content Discovery, Content Recommendation, and Client-Server engagement services and databases" Mr. Widjanarko explained.

Intel works closely with Google Cloud to optimize data practitioner tools across the data pipeline.

"We are delighted to work with Tokopedia to implement the Affinity Google AI Platform Training utilizing Tensorflow optimized with Intel libraries, such as, Intel® MKL-DNN, Intel® DL Boost-VNNI as well as Google Dataproc," said Anurag Handa, Vice President, GM, Cloud and Enterprise Solutions Group, Intel. "These collaborations are used to deliver products and services based on the need of users and the market by using analytics to help identify efficiencies in areas of search and product discovery including buying habits, payment times, goods storage, and shipping logistics."



Intel manufacturing technicians display Intel Xeon Scalable processors during their production cycle.

The Intel® Math Kernel Library for Deep Neural Networks (Intel® MKL-DNN) is an open-source performance library for Deep Learning (DL) applications intended for the acceleration of DL frameworks on Intel® architecture.

Intel® Xeon® Scalable processors, with built-in AI acceleration implemented through Intel® DL Boost – Vector Neural Network Instruction (Intel® DL Boost – VNNI). Intel® DL Boost - VNNI is designed to accelerate AI/Deep Learning use cases (image classification, object detection, speech recognition, language translation, and more).

Through co-engineering, Google Cloud and Intel have delivered generations of custom silicon optimized and built for cloud scale. This cooperation has laid the foundation for specialized Google Cloud instances to accommodate compute-intensive workloads.

“Google Cloud and Intel have been working together for nearly a decade helping customers build their cloud solutions. Tokopedia’s compute-intensive workloads run on Google cloud and are powered by Intel Xeon processors. This is a great testimonial on how our strategic alliances brings the best value to our customers,” Mitesh Agarwal, Regional Director APAC Partner Engineering & S.E.A. Customer Engineering, Google Cloud.

A harmonious blend of technology between Google Cloud running on Intel® Xeon® processors enables organizations to run their business for mass. With cloud computing in mind, this processor is built with features that business will benefit, including scalable processors, AI, etc.

For this case, there are a few cases that Intel has collaborated with Google Cloud for enabling business like eCommerce or the other, such as Data Driven Transformation (data analytics) and Database Modernization (under GC’s Optimize Infrastructure). For Data-Driven Business, they already have a way to consider how

customers are putting analytics at the heart of every decision, such goals for individuals and groups are critical for building a data-driven organization, hiring for an analytical mind-set is as valuable as hiring specific skills, and also ongoing training can go a long way, without requiring a huge budget.

Result³

Tokopedia Play has experienced tremendous growth both on the content creator and viewer sides. Monthly viewership has risen 16x in the first half of 2021, and live shopping adoption rates have also experienced double-digit growth. In the first half of 2021, the platform has also seen an increase in weekly content creation of up to 8x compared to the beginning of 2021.



Intel® Xeon® Scalable processors

In addition, for new merchants, the average livestream can increase product viewership and shop visits by 40% and 20%, respectively, while driving 29% of their orders for the day. Overall, live streaming can also lead to an increase of up to 625x more product detail page views, a 262x increase in shop visits, and drive up to 100% of the shop's daily orders.

By the end of 2022, Tokopedia would expect further growth compared to what Tokopedia had at the beginning of 2022.

Widjanarko commented, "We observed in 2021 that Indonesian buyers increasingly relied on content and social proof to guide their purchase decision. Sellers have also started to see the impact on live shopping and have embraced content engagement as a business lever for them. Meanwhile, in 2022, sellers will demand more tools, analytics, and capabilities from our platform to drive better conversion from their content engagement. Second, we also see that the competition for content creators and content supply will be rife. Hence, emphasis on accelerating user-generated content (UGC) capabilities remain essential."

"Going forward, the platform is looking to develop its live shopping feature for buyers and invest heavily in its content recommendation system. At the same time, we are looking to further integrate Tokopedia Play videos into the main shopping experience. Video content is quickly overtaking image content in the market, and Indonesians have proven to be one of the world's top video consumers. We're still in the early days of live shopping. It's only going to take off from here and be more commonplace in the future," he added.

Some more benefits that Tokopedia enjoys by getting support from Google Cloud running on Intel® Xeon® Scalable processor-based servers:

Manage surge traffic: Tokopedia systems are mostly hosted in N2 instance type in Google Cloud. As we know, N2 types are using the Xeon Scalable technology which promotes better performance. Tokopedia arranges auto-scale capabilities on a certain threshold to mitigate any surge of traffic coming to Tokopedia.

Cost efficient: Google Cloud and Tokopedia's in-house procedure ensure the system development quality have been able to reduce the incident rate. We learned that the Tokopedia systems after migrating to Google Cloud yields up to 20% cost reduction for maintaining the same performance.

Successfully run Tokopedia sales program: The technology offered has yielded beautiful results. Tokopedia had big events like Semarak Ramadan Ekstra in which they did their TV Shows, Live Shopping, and massive marketing and promotion works. The platform has been proven stable and made Tokopedia able to perform on-demand and automatic scaling instantly. Tokopedia achieved zero downtime during such big events with millions of users visiting Tokopedia to watch the show, catching up on promotions, and making purchases.

³All result data and figures are based on Tokopedia's internal measurement

Where to Get More Information

Tokopedia (www.Tokopedia.com)

Google Cloud (cloud.google.com)

Intel Solutions include:

- Intel® Xeon® Scalable processors
- Intel Virtualization Technology (Intel® VT)
- Intel Optimized TensorFlow
- The Intel® Math Kernel Library for Deep Neural Networks (Intel® MKL-DNN)
- Intel DL Boost - VNNI

Partner software solutions include:

VMWare (virtualization SW) and Oracle (database)



Performance varies by use, configuration and other factors. Learn more at www.intel.com/PerformanceIndex.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See backup for configuration details.

Your costs and results may vary.

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