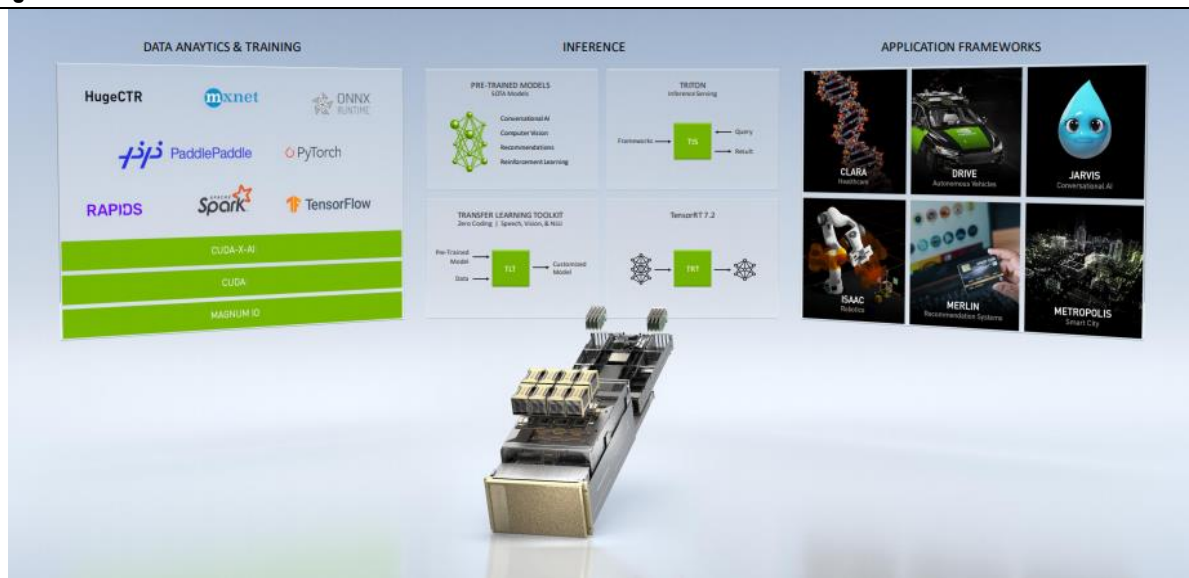




NVIDIA – computing for the age of AI

Figure 1: 3 Pillars of NVIDIA AI



Source: Company website, AMTD Research

AMTD views: Graphics giant – NVIDIA firstly introduced CUDA (Compute Unified Device Architecture) powered GPUs in 2006. This breakthrough enabled GPUs that originally focused on graphic processing to obtain general computing capabilities and to have more powerful performance in parallel processing than CPUs. Today, along with the booming of AI, which has higher requirement for general computing capabilities, NVIDIA is shaping up to be one of the most powerful leader in ‘Age of AI’. At this GTC 2020, NVIDIA is further expanding its ambition of becoming a full stack AI computing company by introducing a variety of chips and AI applications in data centers, edge AI, collaboration tools, and healthcare, and outlined a US\$100bn TAM for its data center business by 2024, with US\$10bn for HPC, US\$45bn for AI platforms, US\$30bn for enterprise AI, and US\$15bn for edge AI, respectively.

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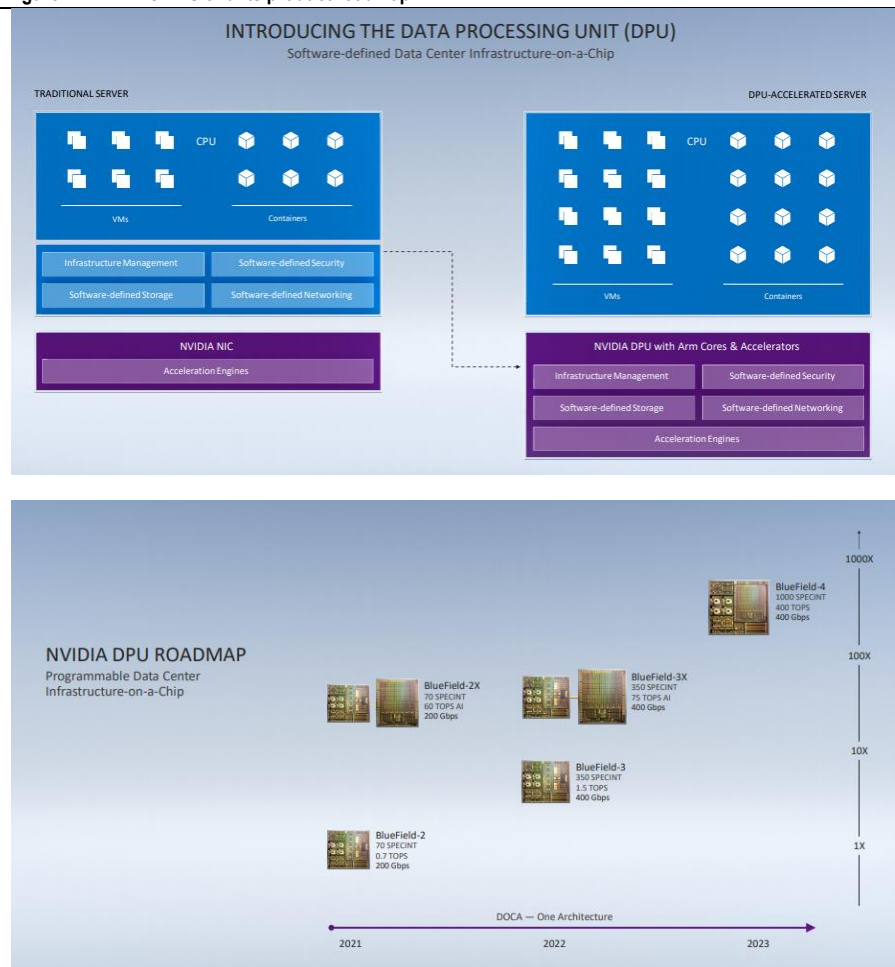
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DPU – software-defined data center infrastructure on-a-chip

Modern data center workloads are diverse and not limited to monolithic applications running on single nodes. The software services which enabled easier resource pooling and management on networking, storage, and security, are normally running on CPUs. However, given the increasing workloads, this kind of software services are consuming more and more CPU resources. To reduce CPUs workloads and improve efficiency, NVIDIA introduced the data processing unit (DPU), which is designed for data movement and security processing.

Meanwhile, NVIDIA also announced the BlueField-2 DPU, which is a programmable processor with accelerators and engines for at-line-speed processing for networking, storage, and security. The launch of DPU can be seen as an important accomplishment of the acquisition of Mellanox last year. In addition, NVIDIA has announced a major partnership with VMware, which is to offload virtualization, networking, storage, and security onto the BlueField and enable distributed, zero-trust security.

Figure 2: NVIDIA's DPU and its product roadmap

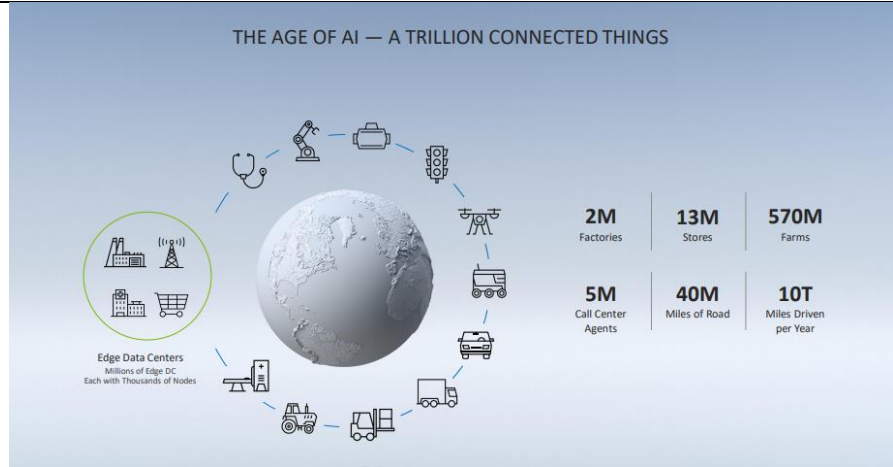


Source: Company website, AMTD Research

EGX edge AI platform – delivers AI server to edge

EGX is a full-stack platform consisting of the AI computer, system software, AI frameworks, and fleet management cloud service. Being used by a broad range of companies, NVIDIA's EGX edge AI platform helps stand up an AI server at the edge data centers. At this GTC, NVIDIA announced that the EXG platform is expanding to combine the NVIDIA Ampere architecture GPU and BlueField-2® DPU capabilities on a single PCIe card, giving companies a common platform to build secure, accelerated data centers. In the same time, NVIDIA are teaming up with partners OEMs, software partners, and industry-focused solution makers to build a rich ecosystem of its edge AI platform.

Figure 3: NVIDIA's edge AI platform



Source: Company website, AMTD Research

Other announcements: AR/VR platform, new RTX, AI application, and healthcare

Other key announcements at this GTC included: 1) NVIDIA is working with AWS to better enable high-quality augmented and virtual reality streaming and its CloudXR platform will be available on AWS's EC2 P3 and G4 instances; 2) new RTX A40 and RTX A6000 GPUs designed for professionals, are built on Ampere architecture with ray-tracing capability, and the company is working around the clock to meet huge demand; 3) NVIDIA Jarvis and Merlin announced in open beta, enabling conversational AI and democratizing recommenders; 4) NVIDIA partners with GSK's AI lab for drug discovery.

News update

10 Oct 2020

Smartphone

Huawei

Huawei Mate 40 series to release on 22 Oct, powered by Kirin 9000 processor

Huawei Mate 40 series will be released on 22 Oct, powered by Kirin 9000. Based on the 5nm process, it is the world's first 5nm SoC integrating 5G modems. The device will feature quad-camera with a 50 MP main camera. The periscope is expected to offer 5x optical and 55x digital zoom. In addition, Mate 40 is expected to support 66W bidirectional fast charging. (Source: [Cnbeta](#))

8 Oct 2020

Semiconductor

MediaTek/Motorola

MediaTek announced MT9602 SoC for high-end smart TVs

MediaTek released the MT9602 smart TV SoC, with comprehensive features targeting modern 4K HDR displays. The SoC has features such as AI-PQ (image quality), AI-AQ (sound quality), HDMI 2.1a support, global HDR, AV1 and AVS2 decoding support. MediaTek said it can improve image and audio quality for real-time video. Flipkart has cooperated with Motorola to launch HD, FHD and QHD resolution smart TVs equipped with MediaTek MT9602 in India. (Source: [MediaTek](#))

8 Oct 2020

Semiconductor

AMD/Xilinx

AMD was gearing up to acquire Xilinx for US\$30 Billion

AMD was in advanced talks to buy rival chip maker Xilinx, in a deal that could be valued at more than US\$30 billion and would mark the latest big tie-up in the rapidly consolidating semiconductor industry. The acquisition of Xilinx would allow AMD to better compete against Intel's sizable footprint in the data-center sphere. Moreover, the FPGAs produced by Xilinx would allow AMD to expand into the rapidly growing AI and networking segments, bolstering the company's portfolio breadth. (Source: [WSJ](#))

8 Oct 2020

Devices

TV

Global TV shipment hit record highs in 3Q20, with 62.05 million units

Quarterly TV shipment reached a historical high of 62.05 million units, up 38.8% QoQ / 12.9% YoY in 3Q20, due to a 20% increase in TV demand in North America, as well as the fact that TV brands had deferred their shipment schedules in 1H20. TV shipment is projected to increase by 4% QoQ in 4Q20, reaching up to 64.53 million units. This will in turn contribute to total yearly shipment for 2020, projected at 216.09 million units, a 0.8% decrease YoY. (Source: [Trendforce](#))

7 Oct 2020

Smartphone

5G penetration in 2020 expected to reach 20% in US

5G smartphone sales accounted for 14% of total US sales in August, up from just 3% in January 2020, according to Counterpoint. Despite the COVID-19 impact on both supply and demand, consumers have shown increased interest in 5G devices as they continue to move down price tiers. 5G sales will likely spike even higher in Q4 when Apple launches its latest iPhone 12 line-up with 5G. 5G smartphones is expected to make up around 20% of total sales in 2020. (Source: [Counterpoint](#))

6 Oct 2020

Xiaomi launched POCO C3 in India for around US\$100

Smartphone

Xiaomi

Xiaomi's overseas brand POCO launched a new smartphone in India - POCO C3, making it the brand's cheapest handset at a starting price of Rs. 7,499 (about US\$100). The POCO C3 shared most of the hardware specifications with the Redmi 9C, the smartphone that was launched this year for Europe and other markets. The Poco C3 is powered by a MediaTek Helio G35. (Source: [Gsmarena](#))

3 Oct 2020

AMD rose to 25% market share, a new record high

Semiconductor

AMD

AMD first made a 25% market share in September for processors, with that figure growing every month at a rate of 1%, according to Steam's Hardware Survey. Besides, Intel still led the CPU with a 74.24% market share in Sep, from 77.54% share in May. As AMD's Zen 3 and Ryzen 5000 series are on the track, we expect AMD's CPU share winning streak to continue. (Source: [Tomshardware](#))

2 Oct 2020

Intel won US government advanced packaging project

Semiconductor

Intel

The U.S. Department of Defense has awarded Intel the second phase of its State-of-the-Art Heterogeneous Integration Prototype (SHIP) program. The second phase of the program will develop prototypes of multichip packages and accelerate advancement of interface standards, protocols and security for heterogeneous systems. The SHIP program enables the U.S. government to access Intel's state-of-the-art semiconductor packaging capabilities in Arizona and Oregon and take advantage of capabilities created by Intel's tens of billions of dollars of annual R&D and manufacturing investment. (Source: [Intel](#))

1 Oct 2020

Global app revenue grew 32% YoY in 3Q20 to more than US\$29.3 billion

App

Apple/Google

Worldwide consumer spending in mobile apps reached US\$29.3 billion and their installs climbed to 36.5 billion across Apple's App Store and Google Play in the third quarter. Consumer spending on in-app purchases, subscriptions, and premium apps climbed by 31% YoY to US\$19 billion globally on Apple's App Store. Spending on Google Play experienced even more substantial growth, increasing 33.8% YoY to US\$10.3 billion. (Source: [Sensortower](#))

30 Sep 2020

Qualcomm completed 3GPP Rel-16 MIMO OTA mm wave performance test

5G

Qualcomm

Qualcomm took the lead in successfully completing the millimeter wave performance test based on the 3GPP Rel-16 MIMO OTA test method in the MNet laboratory of CAICT in China. Qualcomm is also the first chip manufacturer to participate and pass all ten 26GHz 5G millimeter wave RF tests. (Source: [EEWorld](#))

28 Sep 2020

Microsoft rolled out cloud platform for telecoms

Cloud

Microsoft

Microsoft has launched a new cloud platform aimed at enabling telecom operators to build 5G networks faster, reduce costs and sell customized services to business clients. The new cloud platform is powered by Azure and it expects to cut down infrastructure costs, and provide more flexibility towards services and use AI for operations automation. (Source: [Microsoft](#))

27 Sep 2020

Cloud

Tencent

Tencent WeGame accumulated 300 million registered users

Tencent WeGame has covered 9 provinces and cities in China, supporting more than 20 games, and continues to expand the support region and game lineup. WeGame has achieved 300 million registered users, 72 million MAU, over 300 million downloads, 10 billion views, and 30 billion game launches. (Source: [Techweb](#))

25 Sep 2020

Cloud/Game

Amazon

Amazon announced its own game streaming service - Luna

Amazon has just announced Luna, its own game streaming service. It is powered by Amazon Web Services servers and will be available for an “introductory price” of US\$5.99 a month. Users will be able to stream titles wirelessly without downloading the games and can play across PC, Mac and iOS (via the web). Much like Google Stadia, Amazon will also be selling a custom controller that connects directly to the service to reduce latency. The Alexa-enabled Luna Controller will go for US\$49.99. (Source: [Techcrunch](#))

25 Sep 2020

Smartwatch

Xiaomi

Redmi first smartwatch got MIIT certification; could launch in Oct

Redmi first smartwatch going by the model number REDMIWT01 has now cleared MIIT certification in China. This smartwatch will be launching in October with great battery life. (Source: [EEWorld](#))

25 Sep 2020

Semiconductor

TSMC

TSMC to ramp up 3nm chip production to reach 55,000 wafers starting 2H22

TSMC was on track to enter 3nm chip production with monthly output set to reach 55,000 wafers in the second half of 2022. The 3nm process output will climb further to 100,000 units in 2023. (Source: [Digitimes](#))

25 Sep 2020

Smartphone

Global smartphone ASP up 10% YoY in 2Q20

The global smartphone market wholesale ASP increased 10% YoY in 2Q20 even as the shipments declined the highest ever at 23% YoY. The smartphone industry revenue declined 15% YoY in 2Q20. China was the largest contributor to 5G sales. 72% of the global 5G handset revenue came from China. Most of this was driven by the push from Huawei. Overall, the smartphone ASP in China increased 12% YoY and the region contributed to over 34% of the global smartphone revenue, highest since 2016. (Source: [Counterpoint](#))

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We, Brian Li, Halsey Wu and Alyssa Han, hereby certify that (i) all of the views expressed in this research report reflect accurately our personal views about the subject companies and their securities; and (ii) no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed by us in this research report, nor is it tied to any specific investment banking transactions performed by AMTD Global Markets Limited.

As of the date the report is published, Brian Li holds financial interest in the securities of Amazon mentioned in the report.

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AMTD Global Markets Limited has an investment banking relationship with Xiaomi Corporation and/or its affiliate(s) within the past 12 months.

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