AMD unveils next-generation products at Computex keynote

DIGITIMES staff

AMD president and CEO Lisa Su virtually kicked off Computex 2019 by delivering a pre-show keynote on May 27, during which she announced a range of products including the new Zen 2 core, the 3rd Gen Ryzen desktop processor family, the X570 chipset for socket AM4, RDNA gaming architecture, and the 7nm Radeon RX 5700-series gaming graphics card family.

At the same time, Nvidia unveiled Studio platform bringing together RTX GPUs and Studio Stack, and its EGX accelerated computing platform that enables companies to perform low-latency AI at the edge.

Meanwhile, Intel showcased its new 10nm mobile processor (codenamed "Ice Lake") and the special edition 9th Gen Intel Core i9-9900KS processor.

AMD

The Zen 2 core outperforms the historical generational performance improvement industry trend, up to 15% estimated instructions per clock (IPC) uplift over the predecessor Zen architecture, according to AMD. The Zen 2 CPU core powering the next-generation Ryzen and EPYC processors also includes design improvements including lager cache sizes and a redesigned floating point engine.

The 3rd Gen AMD Ryzen desktop processor family includes the new 12-core Ryzen 9 processor, and the X570 chipset for socket AM4 is the world's first PCIe 4.0 supported chipset with more than 50 new motherboards at launch, the vendor said.

RDNA gaming architecture is designed to drive the future of PC gaming, console, and cloud, anticipated to deliver performance, power, and memory efficiency in a smaller package.

The 7nm AMD Radeon RX 5700-series gaming graphics card family features high-speed GDDR6 memory and support for the PCIe 4.0 interface.

Su was joined by fellow Microsoft corporate vice president of OS Platforms Roanne Sones, Asustek Computer chief operating officer Joe Hsieh, Acer co-chief operating officer Jerry Kao and others to showcase the AMD high-performance computing and graphics ecosystem at the event.

"2019 is off to an incredible start for AMD as we celebrate 50 years of innovation by delivering leadership products to push the limits of what is possible with computing and graphics technology," said Su in her Computex keynote.

"We made significant strategic investments in next-generation cores, a breakthrough chiplet design approach, and advanced process technologies to deliver leadership 7nm products to our high-performance computing ecosystem. We are extremely

AMD president and CEO Lisa Su

excited to kick off Computex 2019 together with our industry partners as we prepare to bring our next generation of Ryzen desktop and EPYC server processors and Radeon RX gaming graphics cards to market," Su said.

AMD high-performance gaming updates

With a new compute unit design, RDNA is expected to deliver performance, power and memory efficiency in a smaller package compared to the previous generation Graphics Core Next (GCN) architecture, said AMD. It is projected to provide up to 1.25X higher performance-per-clock and up to 1.5X higher performance-per-watt over GCN, enabling better gaming performance at lower power and reduced latency.

RDNA will power the upcoming 7nm AMD Radeon RX 5700-series graphics cards which feature high-speed GDDR6 memory and support for the PCIe 4.0 interface.

Nvidia

Nvidia said its Studio platform will improve performance and reliability for the world's 40 million online and studio-based creatives who depend on high-performance PCs for their craft.

Studio combines RTX GPUs, as well as the Nvidia Studio Stack of specialized SDKs and dedicated Studio Drivers. It is supported with rigorous hardware and software testing for top creative applications and workflows, according to the vendor.

Major PC vendors also announced RTX Studio notebooks at Computex. The notebooks feature the new Quadro RTX 5000, 4000 and 3000 GPUs, as well as GeForce RTX 2080, 2070 and 2060 GPUs. Many of these laptops feature 4K precision displays and Nvidia Max-Q technology, enabling incredible performance and longer battery life in sleek, thin and light designs.

Nvidia EGX

Nvidia EGX is an accelerated computing platform that enables companies to perform low-latency AI at the edge – to perceive, understand and act in real time on continuous streaming data between 5G base stations, warehouses, retail stores, factories and beyond.

EGX was created to meet the growing demand to perform instantaneous, high-throughput AI at the edge – where data is created – with guaranteed response times, while reducing the amount of data that must be sent to the cloud.

"Enterprises demand more powerful computing at the edge to process their oceans of raw data – streaming in from countless interactions with customers and facilities – to make rapid, AI-enhanced decisions that can drive their business," said Bob Pette, vice president and general manager of Enterprise and Edge Computing at Nvidia. "A scalable platform like Nvidia EGX allows them to easily deploy systems to meet their needs on premises, in the cloud or both."

Arm portrays its strategy for machine learning at the edge

Staff reporter

With one of the strongest processor ecosystems in the industry, Arm's role to accelerate the adoption of machine learning (ML) at the edge can't be overemphasized, and its effort to enhance its CPU performance and software support for ML workloads is now in full swing.

According to Jem Davies, Arm fellow, VP and GM, Machine Learning Group, the market outlook, challenges, and Arm's overall strategy to address the huge opportunity are clearly disclosed.

ML in edge devices is just beginning

"We see ML as one of the most exciting advancements in computers and processors in modern times," Davies said. "As machine learning is exploding across edge devices, we're now to the point where we are seeing huge amounts of activities and some really interesting use cases across all markets Arm technology services."

From his point of view, some of the most interesting use cases and active communities for ML are coming out of the IoT sector using traditionally very small processors like the Arm Cortex-M microcontroller family.

For example, the use cases come from the embedded and IoT spaces, such as life improving medical devices like smart asthma inhalers, through to industrial sorting and robotics to

Arm is enabling ML on edge devices

voice assistants, more intelligent home security and even things like DTVs where there is a lot of activity in super scaling, scene recognition and picture quality enhancement and gesture recognition.

Of course, there are some of the more interesting ones, including the well covered autonomous vehicle and driver assistance; in smartphone a huge range of applications are implementing ML improvements like smarter games engines, richer social media applications, and even utility applications built directly into the OS like predictive text and voice assistants.

"From an Arm perspective, the thirst for ML in edge devices is just beginning and we expect it to continue growing substantially for several years yet," he said. "The use cases are still growing rapidly and we expect an explosion of creativity over the next couple years as the algorithms become more understood and smaller and the developer community really engages with what ML can bring."

But, the challenges are...

However, opportunities always come with challenges. The challenge for Arm is to ensure people have the improved CPU and other processors along with associated software and tools to support their needs today while also ensuring it is working on the products for tomorrow with even more capability, such as ML dedicated

processors.

But at the customers' side, Davies saw lots of confusion as ML is too new and too complicated for them to adopt. "A lot of what we're working on now is just trying to help demystify and clarify things in the technology space as there's a lot of confusion and misinformation out there."

"Two years ago or even a year ago, it wasn't uncommon for people to think that if you wanted to do any ML on a device, you needed to have an ML dedicated processor – a view fuelled by people with dedicated processors to sell – and so we would get asked which processor was best for ML a lot. It depends on what is important to you. So we've spent a lot of time explaining when a small CPU, large CPU, multi-processor CPU, GPU or ML processor would best meet people's needs."

On the other hand, one of the biggest challenges for software developers is the same one they always have: which hardware platform/processor should I target to give my software the widest compatibility with devices?

Aside from that, models have introduced a new and critical component to the technology stack when you are doing ML. A lot of work has gone on in the industry the last few years to make these better understood and more friendly and accessible.

ML are affecting nearly all Arm's products

According to Davies, ML is driving a change in software, and Arm's processors and products are all about running software. As such, his view is that ML is affecting nearly all Arm's products.

"You can see this in the CPUs we have been releasing the last couple years which have had major performance improvements specifically targeted at ML workloads. Often these are 4x or even 10x on generation improvements. This also extends to our latest GPUs and even

our efficient Cortex-M family where we recently released our Helium extensions specifically supporting 15 times improved ML performance in microcontrollers."

"So Arm is focused on offering a huge range of 'processors' that can give customers a vast range of price, performance and power trade-offs. We will be extending that further through 2019 with a range of complementary ML processors for all markets given the market options where heavy ML workloads are needed or ML power efficiency is critical."

He explained that Arm's strategy has been to add capabilities to its CPU and GPU architectures to support ML for some years now. And the company has launched a range of scalable and extensible NPUs (neural processing units) to provide more efficient ML processing in a range of market segments with performance requirements such as in automotive, right down to the tiniest low-power embedded microcontrollers.

As he mentioned, there is no one-size-fits-all approach when choosing processors for ML. "We predict that ML will continue to be run across a range of processors, not just NPUs," he said.

In addition to this, Arm has been investing heavily in ensuring the software is there to get the best performance out of current and future Arm hardware as well as ensuring software portability.

Arm's advantages in the new ML era

It is fair to say that Arm provides the architectures at the heart of modern computing and Arm-based devices are everywhere around us. With this advantage, when disruptions like ML come along, developers will use Arm's architectures first to innovate on, Davies indicated.

"We recently launched a survey to measure where ML processing is being performed, and the most

Jem Davies, Arm fellow, VP and GM, Machine Learning Group

popular was the Arm Cortex CPU architecture, followed by the Arm Mali GPU architecture," he said. "That's a huge advantage for us – it gives us great connections to developers who can then tell us what they need us to develop in terms of software libraries, compilers, development tools etc and what they will want to do themselves."

"This major shift in the industry is something we started some years ago and we could see it spreading across various areas of the company. That's when Arm's Project Trillium was brought to life to help ensure we were taking a broad, holistic and comprehensive view of ML in the business."

He explained that Project Trillium, which covers all of Arm's ML activities, is Arm's and third-party hardware IP and software running ML workloads and applications. Within it are CPU and GPU improvements started many years ago in research, a broad range of complementary current and future ML processors software to

enable ML on Arm, tools, ecosystem and a ramping amount of educational material.

As ML is fundamentally a software problem, Arm is also investing hugely to support ML developers on Arm. Arm NN provides a framework to allow ML workloads to be easily run across a variety of processors: CPUs, GPUs, NPUs and other IP blocks.

"We developed Arm NN, investing over 120 engineering years of effort before donating it to Linaro, and now, with Open Source and Open Governance, our partners are contributing their own efforts to Arm NN, in the confidence that it will become an open standard across multiple industries, not controlled by any one company."

With these big investments in tooling and ecosystem support and development, Arm aims to provide the broadest and most comprehensive range of ML solutions for all ranges of edge devices, and hope to bear fruit in the years to come.

Litemax adopts Intel SDM module to drive revolution in smart IoT industry and meet needs of commercial sphere

Press release

Taking advantage of the strong wings that are built in the field of high-brightness displays and industrial displays, Litemax will fly to a wider world, not only as a supplier of single display devices, but also as an artificial intelligence with display features. The network (AIoT) solution provider provides a new choice of green and intelligent industrial computer solutions to accelerate the realization of smart cities.

Platform integration: A smart city using smart applications

The combination of Litemax panels and Intel SDM gives an advantage in the competitive sphere of developing AIoT products. They have the products, such as high brightness monitors and touch panels and the computing hardware with Intel SDM that is ready-for-integration with AI software. These are the new AIoT digital signage displays entering the commercial environment.

A smart city is not just the application of new-generation information technology such as IoT and cloud computing, but is more importantly the building of a new urban ecology characterized by social interaction, unmanned automation and new media platforms, all through innovative AI integration. To take full advantage of

Litemax's Computex booth is at at Nangang Exhibition Hall 1 Booth No.K0309a

advances such as facial recognition, smart bus stop signs and smart shelves, this next generation of digital signage needs to evolve from single-purpose display hardware to integrated digital computers capable of adapting to changing environments and offering rapid maintenance updates. This will be the innovation integrated into digital signage.

Public display system updates

Commercial Litemax displays with integrated Intel SDM are widely used in public spaces. The compact, slim features of the Intel SDM adapt readily to display mechanisms and meets system integration (SI) requirements. The Intel SDM easily slips in and out of displays to overcome problems associated with assembly and disassembly when updating software

and hardware components for timetable systems installed in elevated locations. This accessibility is important since the information systems market is entering a period of rapid expansion and development. Performance is key in information systems such as banking systems where users want accurate, real-time information on mobile payments and balance inquiries. Devices that use the Intel SDM module can be updated on a continuous basis to easily resolve issues as well as to create a better overall experience for businesses and customers.

Using Intel SDM module will help resolve new issues that may arise in the future as display devices will no longer be used only as a medium for delivering visual information; but as an interactive media tailored to individual user.

SDM advertisement system ISDM-5506

In 2018, Litemax has led the industry in the introduction of integrated commercial display products which support Intel SDM specifications and feature the latest built-in computers equipped with 10-point touch capability, high resolution cameras, facial recognition and the newest AI digital signage to replace conventional static LED monitors and displays. Litemax ISDM-5506 features a 1,200-nit high-brightness Max RGB (NTSC 94%), high picture resolution, with WIFI transmission and reception support. This monitor is the next generation of multifunctional, all-in-one digital signage designed for commercial advertising. It is suitable for a broad array of installation locations including offices, gaming arcades and can be used for a range of transportation systems including, subways, train stations, airports and bus stops. This smart signage replaces static displays that only show fixed messages and provide single-directional marketing for the storefront where the display is located. With the smart expansion SDM, advertising systems can play a brief introduction to all the shops in a building as well as share updates on local traffic and transportation. These systems can also be used to support advertising for additional business opportunities.

Cayin to showcase the latest self-hosted digital signage network

Press release

As a professional digital signage solution provider, Cayin Technology will present the latest product portfolio, including security-enhanced 4K digital signage players and powerful content management servers, dedicated to creating more flexible and reliable business solutions at Computex Taipei.

4K digital signage player: SMP-2200 series

SMP-2200 series supports 4K ultra-high definition, which makes graphics and media performance more immersive when broadcasting contents. Under the compact design of the model, SMP-2210 is furnished with two HDMI and a VGA for three concurrent displays, Moreover,

SMP-2200 series players are equipped with dual LAN ports and a built-in firewall that offer extra protection against open network hazards, resolving one of the main digital media concerns today.

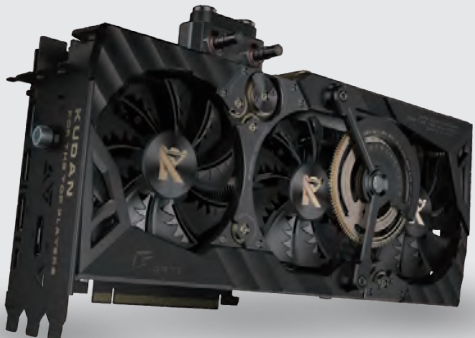### Digital signage content management server CMS V11.0

With the CMS V11.0 upgrade, servers can be designated as a main, site, or backup server to easily create a multi-server architecture. Each CMS server manages up to 4000 SMP players simultaneously, along with an unlimited number of players in the full deployment.

In addition to operating the cloud-serving UI personally at the show, Cayin also provides a free trial version of CMS V11.0 on their website. All visitors are welcome

to Cayin's booth at R1221 in TNEC, Hall 2 to discuss potential cooperation, as well as obtain more digital signage information.
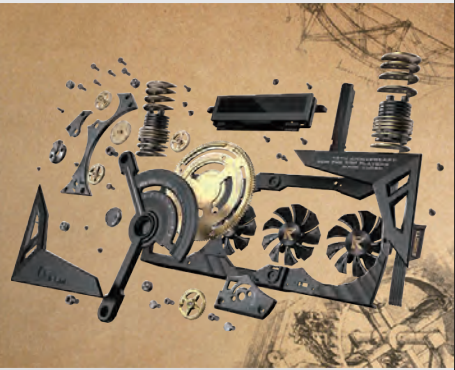

Booth R1221 | TNEC, Hall 2

DIGITIMES Research: Global Server Tracker – 1Q 2019

Global server market

Betty Shyu, DIGITIMES Research, Taipei

Based on Digitimes Research's statistics and analyses, first-quarter 2019 global server shipments exhibited a larger sequential decline than the forecast given in the prior quarter due to weakening market demand and high inventory level resulting from customers ramping up orders during 2017-2018. Global server shipments also declined on an on-year basis in first-quarter 2019. Going into second-quarter 2019, global server shipments may be able to rebound from the low level seen in the first quarter but on-year decline may widen as market demand remains weak and inventory still needs to be depleted.

Among customers of Taiwan-based manufacturers, Facebook had higher demand compared to the others amid a sluggish market in first-quarter 2019, benefiting primarily Quanta and Wiwynn. Quanta particularly showed significant on-quarter growth in shipments. Super Micro still suffered declining shipments due to the speculated spy chip incident. Among Taiwan-based manufacturers, Inventec received fewer orders from most of its major customers compared to the prior quarter amid the slow season while Quanta maintained flat shipment growth from the prior quarter, buoying Quanta's shipment share among Taiwan-based manufacturers close to Wistron's.

Looking into second-quarter 2019, Inspur, Google and Super Micro with declined orders in the prior quarter may make a strong comeback, boosting Mitac, Wistron, Quanta, USI and OSE's shipments to these customers on quarter.

In terms of 2019 whole-year forecast, as shipments usually peak in the third quarter and then come down in the fourth and market demand remains weak in the first-half, growth of global server shipments in 2019 may dip to a new low since 2014. The four leading US-based first-tier datacenter players will still be the main growth drivers, followed by the China market.

According to Digitimes Research's statistics, global server shipments amounted to 3.26 million units in first-quarter 2019, down 10.7% compared to the prior quarter and 9.4% to the corresponding period of 2018. The sequential decline is larger than the previous forecast.

The decline was due to some customers aggressively ramping up orders in 2017 and in first-half 2018, causing inventory level to run high. Weak market demand was also a cause for the decline.

Second-quarter 2019 global server shipments are estimated to grow 6.4% from the low-season level of the first quarter to reach 3.46 million units.

However, the decline from the same quarter a year ago may widen to 13.8%, showing that the industry is undergoing a restructuring.

Global server shipments are estimated to arrive at 6.73 million units in first-half 2019, down 11.8% from the level of 7.62 million units shipped in the corresponding period of 2018.

Shipments breakdown

Among customers of Taiwan-based manufacturers, the most obvious change in first-quarter 2019 was Facebook rising from as the fifth largest client in the prior quarter to the third.

The orders Facebook increased were mainly 4U 16-node servers. In this report, one motherboard is calculated as one server so the additional demand from Facebook for the quarter was quite considerable.

Calculating based on the shipments by Facebook's two main suppliers – Quanta and Wiwynn, Facebook's demand grew 32% sequentially and 35% annually, totaling 370,000 units.

Although Amazon was overtaken by Facebook, its shipments rose 9% sequentially and soared 53% annually, bucking the trend.

Super Micro dropped to the fifth position down from the fourth, mainly affected by the spy chip allegation causing it to lose business.

Super Micro's shipments dropped 19% sequentially and 39% annually to 240,000 units.

The rankings among the main customers of Taiwan-based manufacturers will likely remain unchanged in second-quarter 2019. Inspur, Google and Super Micro with a large decline in demand in the prior quarter will exhibit a significant rebound in second-quarter 2019.

The demand from the three is expected to grow 40%, 20% and 10%-15%, respectively on quarter. Their shares will rebound to 5.7%, 5.6% and nearly 8%.

Shipments from Taiwan makers

Server shipments by Taiwan-based manufacturers came to 2.95 million units in first-quarter 2019. Their share among the global total dropped from above 91% previously to 90.4%.
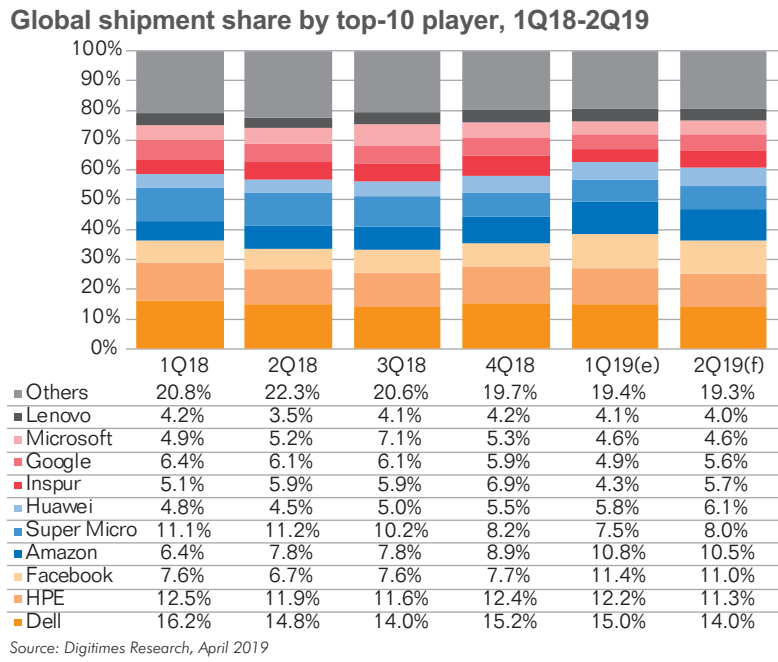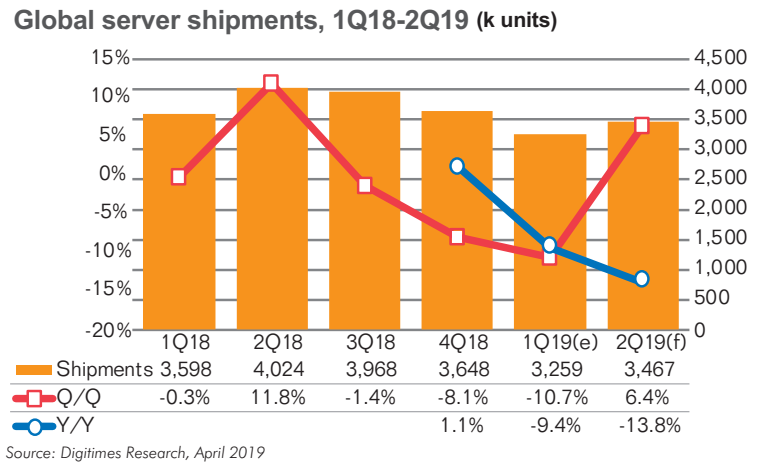
The decline was due to the facts that Amazon began shifting some of its ODM orders to Singapore-based Flextronics in first-quarter 2019 and Huawei's in-house manufactured servers had a smaller sequential shipment decline than that of the global volumes.

Digitimes Research estimates that Amazon gives Flextronics orders for 30,000 to 50,000 servers a quarter.

Huawei's server shipments amounted to 190,000 units, down only 5% on quarter.

The ranking of the top-four Taiwan-based manufacturers in terms of server shipments remained unchanged in first-quarter 2019 – Inventec, Foxconn, Wistron and Quanta. Wiwynn replaced Mitac to sit at the number five spot.

Because of the slow season, most orders from Inventec's main customers went down from the levels of the prior quarter, causing its shipment share to slip 1.1pp to 19.5%.

Global server shipments, 1Q18-2Q19 (k units)

	1Q18	2Q18	3Q18	4Q18	1Q19(e)	2Q19(f)
Shipments	3,598	4,024	3,968	3,648	3,259	3,467
Q/Q	-0.3%	11.8%	-1.4%	-8.1%	-10.7%	6.4%
Y/Y			1.1%	-9.4%	-13.8%	

Source: Digitimes Research, April 2019

Global shipment share by top-10 player, 1Q18-2Q19

	1Q18	2Q18	3Q18	4Q18	1Q19(e)	2Q19(f)
Others	20.8%	22.3%	20.6%	19.7%	19.4%	19.3%
Lenovo	4.2%	3.5%	4.1%	4.2%	4.1%	4.0%
Microsoft	4.9%	5.2%	7.1%	5.3%	4.6%	4.6%
Google	6.4%	6.1%	6.1%	5.9%	4.9%	5.6%
Inspur	5.1%	5.9%	5.9%	6.9%	4.3%	5.7%
Huawei	4.8%	4.5%	5.0%	5.5%	5.8%	6.1%
Super Micro	11.1%	11.2%	10.2%	8.2%	7.5%	8.0%
Amazon	6.4%	7.8%	7.8%	8.9%	10.8%	10.5%
Facebook	7.6%	6.7%	7.6%	7.7%	11.4%	11.0%
HPE	12.5%	11.9%	11.6%	12.4%	12.2%	11.3%
Dell	16.2%	14.8%	14.0%	15.2%	15.0%	14.0%

Source: Digitimes Research, April 2019

Tung: Taiwan startups must create characteristics

Mark Tsai and Rodney Chan,
DIGITIMES

TH Tung, chairman of Taipei Computer Association (TCA), likens the startup scene – whose fundamental elements are capital, talent, technology and market – to wine making, which depends on the sunshine, rainfall and terroir. Apart from these, the type and quality of the grapes are also very important.

That is to say, the characteristics are very important in raising the added-value. There have been so many different wines using various types of grapes around the world, but Burgundy winemakers have been sticking to one single grape for their red wine, and yet they still manage to stand out in the industry. This is because the wine from this appellation has its characteristics and clear market target.

Tung takes his analogy further to the watchmaking industry. Electronic watches are the mainstream of the market, and the popularity of the Apple Watch and other smartwatches has been rising. But the Swiss makers of mechanical watches have never lost their appeal to consumers of the high-end market segment.

Tung noted that Taiwan does not lack capital, but the concern is how to direct these investment funds into startup businesses that may stand out from their international competitors. He disagrees with the idea that the government should make a policy to encourage a massive influx of capital into Taiwan. He said that without a clear set of regulations to implement to such policies, a lot of the funds would end up not in the tech sector, but rather in the real estate market, shooting up housing prices in Taiwan and creating a bubble in the stock market.

Taiwan's characteristics

In the face of growing competition from Southeast Asia, Tung said Taiwan, with limited land and a small population, is very similar to Israel, Singapore and the Netherlands, and it needs to develop its own characteristics and focuses on specialized services in order to stand out from the global IT ecosystem, and create a "Taiwan brand." The road to innovation will lead Taiwan to see fast growth again in the future, Tung believes.

The government plays an important role in economic and technological developments. The developments in Japan and Singapore are examples. Singapore is high in the rankings of countries with a free market economy. But its government has been embracing a planned economy, having successfully turned the country into an important petrochemical hub in the area. It has also become a financial center, thanks to government policy support.

Singapore has a large population of migrant workers, all of whom stimulate developments of various business sectors that provide services and support for the workers. The city state may not be much bigger than Taipei, but it is the destination of an annual volume to 15 million tourists. To boost its tourism, Singapore has made policy changes that were unthinkable in the past, such as legalizing gambling.

Tung said the lesson to be learned from Singapore is that there must a balanced development. Taiwan should not rely too heavily on its ICT exports; it must maintain a balanced development.

Japan may not be as open to foreign workers as Singapore, but the Abe government has already introduced a new policy trying to attract more foreign workers.

For Taiwan to attract foreign talent and create an optimal environment for startups, it must introduce ways to relax the restrictions on foreign investment, such as easing the visa requirements.

The government role

While Tung shows skepticism about how market economy and planned economy can really work together seamlessly in Taiwan, he still thinks there is room for the government to make changes in terms of opening the door wider to foreign professionals.

Tung said he can foresee that the gradual relaxing of regulations and establishment of IT industry infrastructures will motivate more Taiwanese investors to return home, creating job opportunities. This would boost the startup scene in Taiwan, as well as the quality of life and jobs.

But he identified one major problem with the government's calls for businesses to move their manufacturing operations back to Taiwan from China – a trend accelerated by the escalating US-China trade war.

Relocating a plant is not just about moving the equipment and recruiting assembly line workers for the relocated the plant. It will need a team of managers to run it. The original team should be able to make the relocated plant up and running fast, but the government is not supporting the idea of letting Chinese managers come to work in Taiwan, making it difficult for Taiwanese businesses to relocate their manufacturing plants back home.

Many Taiwanese businesses have clearly shown strong intentions of returning home, but the problem with the relocating of the managers needs the government relaxing the regulations.

AI and 5G:
The 'magical' innovations

While 5G and IoT promise explosive growths of the next generation, Tung noted that every era has its own "magic" that boosts the economy. Japan relied on washing machines, refrigerators and TVs to get out of the economic doldrums in the post-World War II era during the 1950s. And in the 1960s, the "magical" products were cars, color TVs and air conditioners.

Tung said the color TV fad that Sony created at the time was comparable to what we feel about the trendsetter, Apple, of the present time. The birth of air conditioners gave people more comfort on hot summer days. Tung said such changes that increase value and solve problems are what tech innovation is all about. But he thinks management of innovative technology is as important as the hardware and software technology itself.

ICT vendors have been able to make a living as long as there are customers buying their products. But in the AI and 5G era, things may work differently for businesses. With so much R&D going on and so many innovative ideas emerging, it is the infrastructure of smart city that will be necessary to materialize the R&D and innovative ideas of businesses. That means that businesses' efforts alone will not be

TH Tung, chairman of Taipei Computer Association

sufficient; it will need strong government support – from the national to local levels – to upgrade and rebuild the cities in order to materialize the AI and 5G applications.

Unicorns and disruptive businesses

According to Taiwan's government figures collected between 2007 and 2014, the survival rates of startup businesses from the first to fifth year of operations are 89%, 78%, 69%, 62%, and 57% respectively. They are similar to those in the US, Germany and other countries that are known for their startup scenes.

Tung said it is not easy for Asian startups: The risk of investment is high, and it is very difficult for one to last beyond 10 years. Startups may all want to become unicorns – privately owned businesses whose market cap is estimated at more than US$1 billion – but Tung pointed out that few unicorns have been able to make a profit. He said the aim of incubating a unicorn should therefore focus on what value and service it can bring to society.

The mentality of investors has changed. In the past, a company that wanted to get listed on a stock market would have to make profits for several years before it could stand a chance of submitting an application for listing, according to Tung.

In comparison, Foxconn's orders remained stable, total shipments down only 2.5% on quarter, buoying its share to 19.7%, a new high in recent quarters.

Wistron's shipments slid 15% on quarter, larger than the average decline, and its share dropped to 15.9%. Quanta's shipments stayed at a similar level to the prior quarter, bringing its share closer to that of Wistron's.

Mitac experienced a large decline in orders from Inspur, causing its share to drop significantly behind Wiwynn's.

For second-quarter 2019, Inventec can expect its share to rebound while Quanta will likely further narrow its gap with Wistron.

Thanks to increasing orders from main customers, Inventec can shake off the low season slump.

With most Taiwan-based manufacturers enjoying growing shipments on quarter, Foxconn will see flat growth or even moderate decline so its share will fall back.

Quanta has the capability to integrate software and hardware and is stepping up efforts toward customers other than first-tier datacenters so its sequential shipment growth has a good chance of surpassing Wistron's. The two will make comparable volumes of shipments with the gap between them narrowing.

Mitac can expect big orders returning from Inspur, enabling it to regain the number five position.

Client-maker server shipment matrix

Facebook's orders continue to show concentration toward Quanta. In terms of shipments, shipments of Quanta will increase moderately while those of Wiwynn will maintain flat.

The share of Quanta's orders from Google will also edge up 2.2pp to 61.5%.

Wiwynn's orders from Microsoft will likely grow 10% and those given to Inventec will pick up 30%. The shares of their orders from Microsoft will expand 1pp and 4.6pp points to 41% and 28% respectively.

Looking ahead to second-quarter 2019, Digitimes Research expects Quanta's dependency on Google to grow 3.9pp to 24.5%.

Quanta's shipments to Google will surge more than 20% sequentially, higher than those to its other customers.

As Inspur ramps up its orders from the level of the prior quarter, Mitac's and Wiwynn's dependency on Inspur will increase 7.7pp and 3.4pp to 64.4% and 9.8% respectively.

Inventec's shipments to Amazon will likely soar 40% on a quarterly basis, hoisting its dependency on Amazon up 2.2pp to 10.9%.

In terms of order distributions in first-quarter 2019, Facebook and Microsoft both increased the ratios of their ODM orders placed with Quanta.

The ratios of orders Facebook and Microsoft placed with Wiwynn both soared in fourth-quarter 2018 but then the orders got dispersed to other manufacturers in first-quarter 2019.

Facebook's orders to Quanta grew more significantly than those to Wiwynn in first-quarter 2019, hoisting Quanta's share up 7.7pp to nearly 60%.

Microsoft's orders to Quanta also went up while those to Wiwynn went down sequentially. As a result, Quanta's share expanded 7.2pp to 20%. The shares of Inventec and Foxconn each edged up 2-4pp.

In first-quarter 2019, Flextronics received about 10% of Amazon's orders. Amazon's orders to Inventec and Mitac increased moderately on quarter while those to Quanta decreased and those to Foxconn stayed roughly at the same level.

The shares of Super Micro's orders to OSE and USI expanded and so did the share of servers manufactured by its affiliate Compuware. The combined share of the three climbed 7.4pp to 67.1%.

In terms of ODM manufacturers' dependency on individual customers, their dependency on Facebook exhibited the most significant changes in first-quarter 2019 as Facebook had increased the most orders.

Wiwynn and Quanta saw their dependency on Facebook surge 13.7pp and 15.7pp to 67.3% and 47.7% respectively.

Wiwynn's dependency on Microsoft showed a decline by a similar extent. Quanta's dependency on its other customers also decreased correspondingly.

Inventec's shipments to Amazon went up significantly on quarter, buoying its dependency on Amazon up 3.3pp to 8.7%.

The increase in Mitac's shipments to Amazon was similar to the decrease in its shipments to Inspur so its dependency on Amazon climbed 9.8pp to 15.5%.
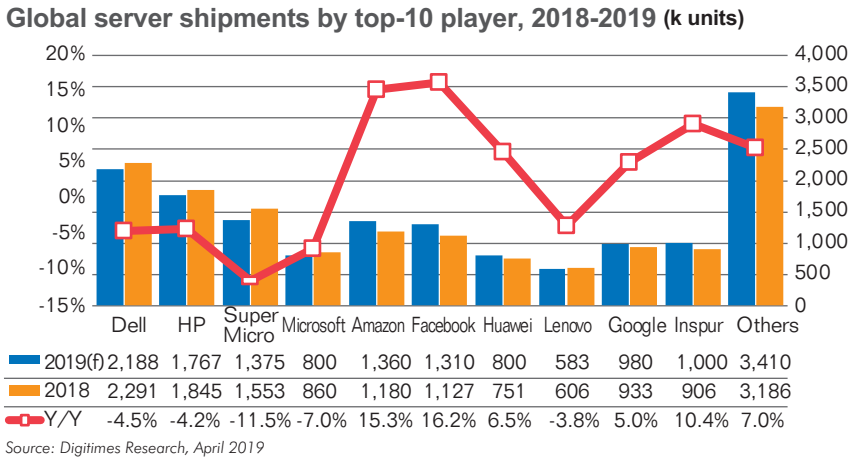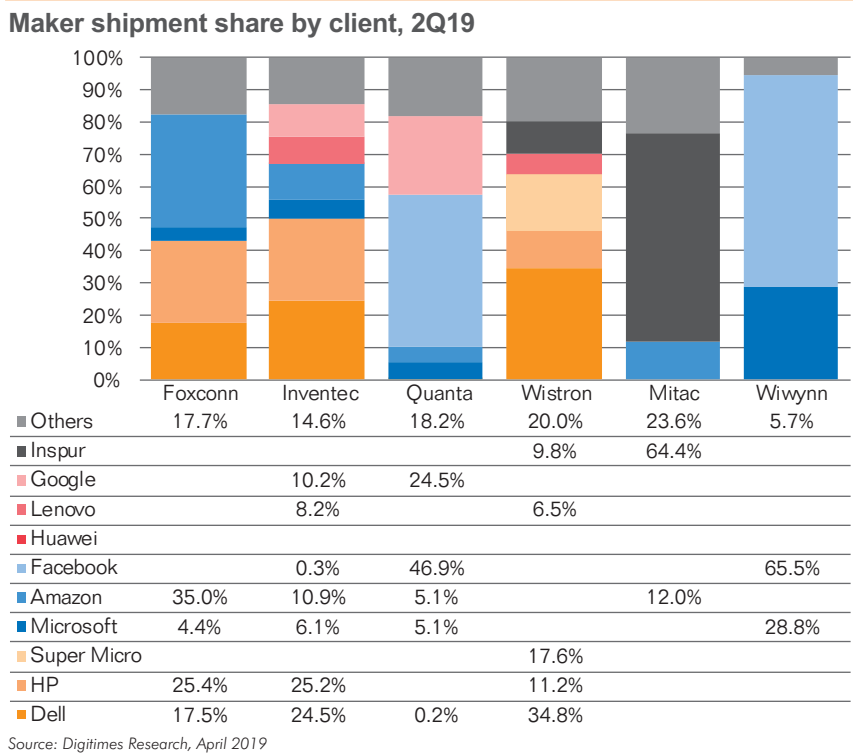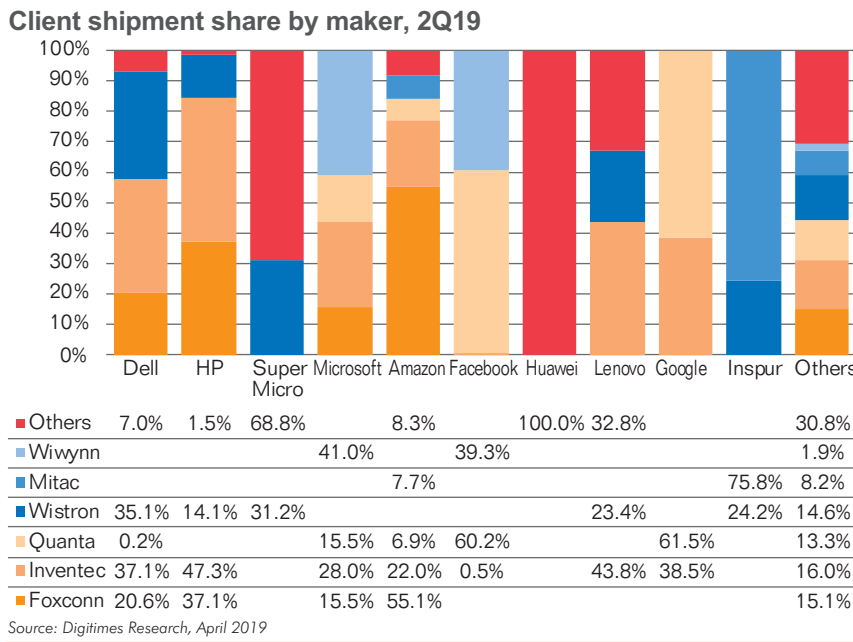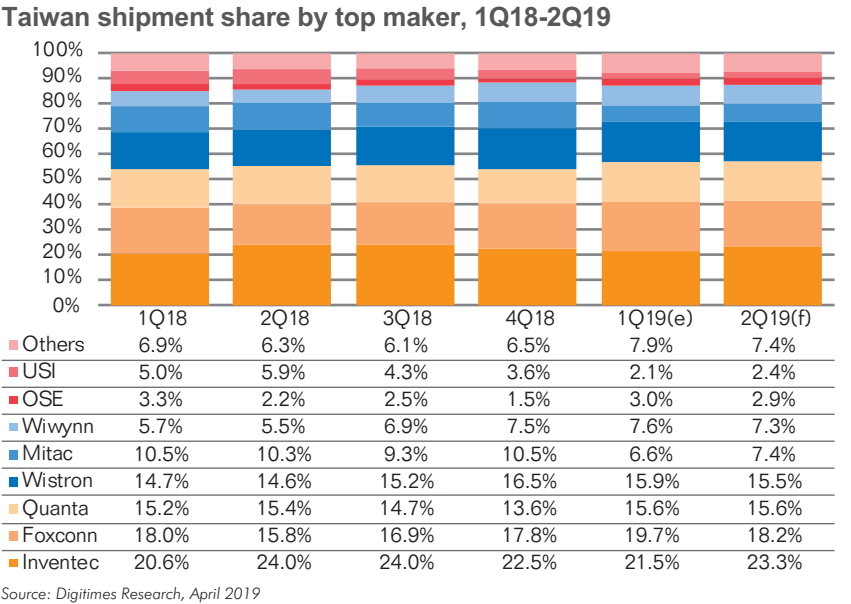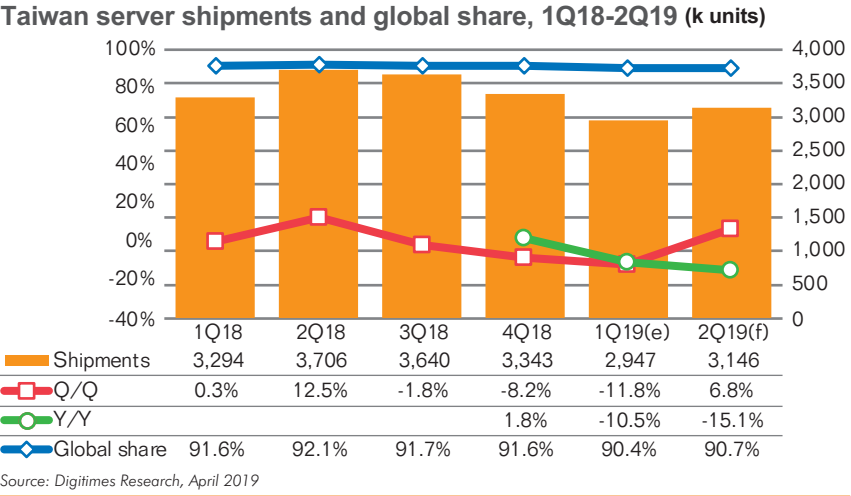
Annual shipments

According to Digitimes Research's forecast, global server shipments will grow moderately to 15.57 million units, up 2.2% in 2019.

Some customers began digesting their inventory in second-half 2018 and the process is likely to continue for the whole first-half 2019. On top of that, weak market demand is also causing the market to see only the moderate growth.

Digitimes Research estimates that 6.73 million servers will be shipped in first-half 2019 and 8.84 million units in second-half 2019, a ratio of 43:57.

Demand from first-tier datacenters will exhibit a larger shipment increase than the average in 2019. Demand from the leading four US-based datacenters will hike 8.5% and their combined share in overall shipments will expand from 26.9% in 2018 to 28.6% in 2019.

Orders from first-tier datacenters including Amazon and Facebook as well as China-based vendors such as Inspur will exhibit stronger-than-average shipment growths in 2019.

Taiwan server shipments and global share, 1Q18-2Q19 (k units)

	1Q18	2Q18	3Q18	4Q18	1Q19(e)	2Q19(f)
Shipments	3,294	3,706	3,640	3,343	2,947	3,146
Q/Q	0.3%	12.5%	-1.8%	-8.2%	-11.8%	6.8%
Y/Y			1.8%	-10.5%	-15.1%	
Global share	91.6%	92.1%	91.7%	91.6%	90.4%	90.7%

Source: Digitimes Research, April 2019

Taiwan shipment share by top maker, 1Q18-2Q19

	1Q18	2Q18	3Q18	4Q18	1Q19(e)	2Q19(f)
Others	6.9%	6.3%	6.1%	6.5%	7.9%	7.4%
USI	5.0%	5.9%	4.3%	3.6%	2.1%	2.4%
OSE	3.3%	2.2%	2.5%	1.5%	3.0%	2.9%
Wiwynn	5.7%	5.5%	6.9%	7.5%	7.6%	7.3%
Mitac	10.5%	10.3%	9.3%	10.5%	6.6%	7.4%
Wistron	14.7%	14.6%	15.2%	16.5%	15.9%	15.5%
Quanta	15.2%	15.4%	14.7%	13.6%	15.6%	15.6%
Foxconn	18.0%	15.8%	16.9%	17.8%	19.7%	18.2%
Inventec	20.6%	24.0%	24.0%	22.5%	21.5%	23.3%

Source: Digitimes Research, April 2019

Client shipment share by maker, 2Q19

	Dell	HP	Super Micro	Microsoft	Amazon	Facebook	Huawei	Lenovo	Google	Inspur	Others
Others	7.0%	1.5%	68.8%		8.3%		100.0%	32.8%			30.8%
Wiwynn				41.0%	39.3%						1.9%
Mitac				7.7%					75.8%		8.2%
Wistron	35.1%	14.1%	31.2%			23.4%			24.2%		14.6%
Quanta			15.5%	6.9%	60.2%				61.5%		13.3%
Inventec	37.1%	47.3%		28.0%	22.0%	0.5%		43.8%	38.5%		16.0%
Foxconn	20.6%	37.1%		15.5%	55.1%						15.1%

Source: Digitimes Research, April 2019

Maker shipment share by client, 2Q19

	Foxconn	Inventec	Quanta	Wistron	Mitac	Wiwynn
Others	17.7%	14.6%	18.2%	20.0%	23.6%	5.7%
Inspur				9.8%	64.4%	
Google		10.2%	24.5%			
Lenovo		8.2%		6.5%		
Huawei						
Facebook		0.3%	46.9%			65.5%
Amazon	35.0%	10.9%	5.1%		12.0%	
Microsoft	4.4%	6.1%	5.1%			28.8%
Super Micro				17.6%		
HP	25.4%	25.2%		11.2%		
Dell	17.5%	24.5%	0.2%	34.8%		

Source: Digitimes Research, April 2019

Global server shipments by top-10 player, 2018-2019 (k units)

	Dell	HP	Super Micro	Microsoft	Amazon	Facebook	Huawei	Lenovo	Google	Inspur	Others
2019(f)	2,188	1,767	1,375	800	1,360	1,310	800	583	980	1,000	3,410
2018	2,291	1,845	1,553	860	1,180	1,127	751	606	933	906	3,186
Y/Y	-4.5%	-4.2%	-11.5%	-7.0%	15.3%	16.2%	6.5%	-3.8%	5.0%	10.4%	7.0%

Source: Digitimes Research, April 2019

Proscend steps up efforts toward industrial-grade communication products

Press release

Proscend, specializing in industrial-grade niche communication products for years, showcased a full range of industrial cellular routers at Embedded World 2019, taking place in Nuremberg, Germany in February. An IP68 compliant outdoor model that remains operable when completely submerged under water was particularly eye-catching. Proscend also unveiled its independently developed Integrated Service Management System (ISMS), an intelligent cloud-based solution that helps businesses stay on top of machine conditions at all times and troubleshoot remotely when necessary to ensure efficient and continuous operation of IoT applications. Proscend impressed visitors to Embedded World 2019 with its strong hardware and software capabilities.

According to Proscend president Jim Chen, established two decades ago, Proscend bases its business development on solid technological strength and highlights its corporate philosophy of cultivating long-term relationships with customers. This has enabled Proscend to build up presence in the global communication equipment market. Its products are used in major projects around the world, including power plants in Germany, rapid transit systems in France and national railways in Japan. Proscend has also engaged in strategic collaborations with India's largest telecom operator Airtel

and thereby gained ground in the India market. With a footprint covering more than 30 countries now, Proscend expects to expand presence to over 60 countries within two years and enter into long-term relationships with partners in Africa, Latin America, Indonesia, Thailand and Vietnam with enormous market potential.

Proscend started out focusing on single-pair high-speed digital subscriber line (SHDSL) equipment and rose to become one of the global leaders in the segment, notes Chen.

Based on the core xDSL expertise, Proscend then augmented its product portfolio to include VDSL2 P2P, VDSL SFP, Long Reach PoE switches. These products come with unique features and specs and are the reasons why Proscend is able to win market favors. For example, Proscend's Long Reach PoE switch supports 1Km long distance connections as opposed to the 100m transmission range of most conventional Long Reach PoE switches. Featuring a compact size, Proscend's VDSL SFP reliably converts optical equipment into DSL signals which are transmitted over copper cables. It is a niche product that attracts a lot of inquiries.

In view of the fact that xSDL is a mature technology with the market becoming saturated, Proscend foresees existing products such as SHDSL, VDSL2 P2P, VDSL SFP and Long Reach PoE switches will have little room for growth; so five

years ago, it began to shift its R&D focus toward industrial cellular routers with promising outlook.

Industrial-level expertise + long-term customer trust spells success

Although the industrial cellular router market already has quite many first movers, Proscend is able to repeatedly beat the competition to iconic projects based on its solid technological strength in providing customized services. Its products have been put to use in several projects in the US, France, Japan and Israel. For example, an overseas customer uses Proscend's industrial cellular routers in security boxes which are installed at remote wilderness areas to monitor endangered species.

In response to the need for compact routers by smart surveillance systems that have to accommodate IP cameras and network equipment in their small footprint, Proscend modified its product design through pre-kickoff discussions with the customer. Furthermore, Proscend is also working on diverse customization projects for smart healthcare and smart transportation applications throughout different regions in the world.

Chen emphasizes that on top of its expertise in industrial-grade communication equipment, Proscend engages in cross-industry collaborations to create the right solution. It combines efforts with partners across different industrial sectors

in different countries around the world to promote the right solution to the right target group. As part of such efforts, Proscend actively participates in major international show events including Hannover Messe, Embedded World and Smart Cities India Expo to introduce its products and technologies to the world and enhance its corporate image. By taking part in these events, Proscend can tap potential partnership opportunities, which can grow into formal business alliances, helping it penetrate into new markets one after another.

The partnership between Proscend and Indian telecom operator Airtel sets a good example. Every time when Airtel has an idea for a new application service, it first consults Proscend. Then, Proscend either develops the product in house or joins efforts with other Taiwan-based manufacturers to come up with the product that satisfies Airtel's needs.

Through long-term collaborations, they have established mutual trust and rapport. Proscend, originally focusing on ODM/OEM manufacturing, has built up presence in India and markets its own brand under its subsidiary Proscend Communications India Private Limited. Enjoying its unique success experience in India, Proscend not only looks forward to duplicating the success to other countries but also welcomes partnerships with fellow Taiwan-based equipment suppliers.

Colorful and Chaintech showcase flagship gaming products and Nvidia DGX workstation

Press release

China's No. 1 gaming hardware brand Colorful Technology joins forces with Chaintech to exhibit its high-end brand iGame series at booth M1112 at Computex 2019.

The latest iGame GeForce RTX graphics cards Colorful will put under the spotlight at Computex include six products - iGame GeForce RTX 2080 Ti Kudan, iGame GeForce RTX2080 Vulcan X OC and other GeForce RTX 2080 high-end models. Additional products that dazzle heavy gamers will also be on exhibit, including

iGame GeForce GTX 2070 Vulcan X OC, iGame GeForce RTX 2060, iGame GeForce GTX 1660 and iGame GeForce GTX 1650.

Colorful's GeForce RTX20 series iGame graphics cards feature the new Turing GPU architecture and RTX platform, delivering real-time ray tracing performance six times better than the previous generation graphics cards. Enabling real-time ray tracing and AI implementations for games through the powerful Nvidia Turing GPU architecture, breakthrough technologies and super-fast VRAM, the GeForce RTX20 series iGame graphics cards achieve high-fidelity visual effects and high-performance gaming

with the best hardware configuration complementing gaming GPU.

As to memory products, the high-end iGame DDR4 Vulcan X 3200 being showcased uses Samsung's high-speed B-Die DRAM memory, guaranteeing stable DDR4 operation at 3200Hz and enabling overclocking at even higher performance. The double-data-rate design enables two data transfers per clock cycle, delivering free-flowing gaming experience.

Chaintech has expanded into AI applications with the acquisition of AI server system provider Sitonholy. Chaintech presents the Nvidia Tesla V100 based

Nvidia DGX Station, a multi-function platform supporting accelerated data analysis and deep learning training and inference. The workstation is an AI PC packing the capacity of 400 CPUs.

Memxpro showcases new industrial TLC SSDs for smart surveillance and retail markets

Press release

Memxpro, a leading DRAM module and SSD solution provider for defense, industrial, in-vehicle, and enterprise markets, will showcase software technology and a broad range of PCIe and SATA TLC SSD form factors, along with high-speed DDR4 DRAM module solutions at Computex 2019.

These new products target intelligent transportation, security and surveillance, and smart retail storage applications. Featuring large capacity, high performance, high shock and vibration resistance, extended endurance, industrial wide temperature option, and data security, these budget-friendly smart SSDs come with Memxpro's self-developed device monitoring and data backup software toolsets. New industrial-grade TLC SSD ensures a high ROI for write intensive applications within the growing field of AIoT edge computing and the booming business opportunities of smart retail signage, intelligent transport and railway surveillance, smart street lighting control, and intelligent parking systems.

High-speed computing storage

PCIe SSD is twice or three times faster

in read/write speed than SATA to meet AIoT requirements. Memxpro PCIe TLC SSD includes U.2 and M.2 2280. The PCIe MVMe interface controller with 10K P/E cycles and 3D TLC combines performance and durability. It is the best solution for industrial and intelligent applications requiring high-speed, large volume data transmission throughput. The new Memxpro DDR4-2666 memory modules possess attributes of high-speed, high-compatibility, low-power-consumption, high-reliability, and wide temperature range support. They are the first choice for embedded applications, industrial equipment, and edge devices operating in challenging environments with fluctuating temperatures.

Reliable data read/write: 10K P/E cycle and low WAF

Smart city technologies are rapidly being developed for diverse global markets. Applications for these markets require reliable storage media to handle high-clarity video, large data acquisition and analysis, and stable performance in challenging environments. Equipped with Micron's original 10K P/E cycle TLC flash, Memxpro 3D TLC SATA III SSD ET30 series offers a total bytes written

(TBW) of up to 5,500TB for its 1TB SSD and compared with consumer TLC SSD, it offers 13-15 times better TBW. Take as an example 60 Mbps of video, the total amount of written data over five years will be 1,182TB. This means a 1TB ET30 drive connected to single camera can be used for 23 years and if you were to connect four cameras simultaneously, you would be able to use them for over five years.

Worry-free ruggedness and advanced data security

SSD are definitely much less sensitive to vibration and shock, as well as more resistant to temperature compared to HDD, making them better for transportation mobility storage. SSDs provide a huge performance advantage over hard drives — they're faster to start up, faster to shut down, and faster to transfer data. Memxpro utilizes new Silicon Motion's SSD controller with 3D TLC flash, which supports AES-128/256 data encryption technology and provides excellent information security.

Work locally, view centrally, manage remotely

Whether used in chain stores or railway

Memxpro innovative PCIe/SATA SSD solution and smart monitoring tool enable an intelligent optimization of customer's system.

stations across the country, Memxpro mSMART4.1 has tapped into the cloud with Microsoft Azure IoT and supports simultaneous management of multiple storage devices for total device status control. When it detects high risk conditions, warning notices are given out to remind users to take preventative action, reducing maintenance and enhancing operational efficiency.

Whether you're after industrial grade SSD for intelligent transportation, security and surveillance, or smart retail storage, Memxpro has the right product. Memxpro is at Computex, Booth No. J1122, Nangang Exhibition Center, Hall 1, 1st Floor.

StorArt announces LDPC + AI eMMC controller that enables next-generation mobile devices

Press release

StorArt Technology, a leading NAND flash controller solution provider, has launched a new eMMC5.1 controller, SA3635, supporting HS400 interface for all mainstream NAND flash in the market.

StorArt's SA3600 series, SA3625/SA3635, are eMMC5.1 controllers tailored for embedded-NAND applications with the interface speed up to 400MB/s (HS400). They not only fully complies with JEDEC eMMC 5.1 spec, but also are backward compatible with legacy ones (eMMC4.3 to eMMC5.01).

High-performance and low-power are achieved by adopting a powerful 32-bit CPU, patented architecture (LDPC + AI), proprietary hardwired ECC engine, dynamic power management and advanced process technology, making it suitable for portable applications like smartphones, tablets, e-books, GPS, gaming consoles and other embedded systems.

StorArt's eMMC controller SA3600 series are also meant for OTT, education tablets, smart TVs/STB, and other embedded eMMC/eMCP electronic devices. SA3600 series supports bus speed modes Default Speed/HS-SDR/HS-DDR/HS200/HS400. StorArt's new AI + LDPC technology secures NAND endurance and reliability; excellent sudden power-off recovery to ensure data integrity; low power consumption, high compatibility; and outstanding wear-leveling algorithm that extends NAND flash life time.

StorArt eMMC controller SA3600 series

QNAP to showcase backup solution with deduplication, AI-powered smart applications

Press release

QNAP Systems (QNAP), a leading computing, networking and storage solution innovator, is at Computex 2019 (Nangang Exhibition Center, Hall 1, Booth No. J0830) showcasing its lineup of solutions and products.

At the show, QNAP will exhibit Hybrid Backup Sync 3.0, an efficient backup solution with data deduplication functionality; QuMagie, an AI-powered smart image recognition system; innovative network appliances; enterprise-class flash-optimized solutions; and Industrial IoT solutions. QNAP will also unveil Drive Analyzer, an AI-enhanced solution co-developed ULINK Technology (an industry leader in drive testing technologies) for analyzing and predicting the expected life of storage drives.

Hybrid Backup Sync 3.0 is an integrated backup & recovery solution for local, remote, and cloud storage space; helps minimize downtime and maximize backup efficiency. It now includes QuDedup technology that deduplicates the data at the source to increase the efficiency of multi-version backup to the destination storage while also optimizing storage utilization. With the support of over 20 integrated cloud services and the TCP BBR algorithm, users can easily implement hybrid cloud backup with greater flexibility and efficiency.

QuMagie is QNAP's next-generation photo management application that integrates AI-based photo organization. It uses AI to improve facial recognition, subject recognition and geography information analysis of images stored in the NAS to provide an upgraded user

experience for media file management. More apps (including Qsirch 4.1 and Qfiling) also leverage AI to facilitate photo searching.

QVR Pro 1.3.0 is QNAP's next-generation video surveillance solution, now includes facial recognition. With QVR Face, an advanced smart imaging application based on Intel OpenVINO and Intel VAS AI face modeling, QVR Pro can accurately identify people in surveillance streams to satisfy various monitoring needs. The facial information and warning events analyzed by QVR Face can be queried and received by the QVR Pro Client.

QNAP boosts networking efforts to roll out a refreshed Guardian QGD-1600P that integrates managed switch, Power over Ethernet (PoE) capabilities, and NAS into one device. The QGD-1600P is a 16-port managed switch based on the Microchip VSC7425 that

features port-based PoE control and is IEEE 802.3bt ready with power level up to 90W, and supports VLAN and QoS.

The QGD-1600P also features an Intel Celeron J4105 processor, two 2.5-inch SATA drive bays, two PCIe slots, HDMI output, and runs the QTS operating system with the App Center to realize various applications including virtual machines, containerized apps, and video surveillance.

Optimized for Industrial Internet of Things (IIoT), QIoT Suite 2.0 supports OPC Unified Architecture (OPC UA) to enhance IoT application potential for industrial automation. It supports OPC UA servers/clients, as well as a gateway to value mapping among servers and clients, assisting organizations in easily adopting IIoT solutions into their businesses with boosted productivity and reduced costs.