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Computex 2018 adds new focuses on 5G, blockchain

DIGITIMES staff

Computex has added two new themes to the 2018 edition in response to some of the hottest trends in the tech industry: 5G and blockchain – along with the mainstays that have been featured at the largest IT tradeshow in Asia.

Computex this year gathers together 1,602 exhibitors – including Intel, Nvidia, Microsoft, Supermicro and Amazon – from 28 countries to showcase in 5,015 booths their technologies, products, concepts and trends.

The addition of the two new themes at this year's Computex – running from June 5-9 – is meant to support global tech partners to plan ahead for the next generation technologies while enabling the annual tradeshow to continue playing its role of building a global IT ecosystem, according to the organizers.

The business outlook of 5G is enormous. The Computex organizers cited Gartner as indicating Internet of Things (IoT) will be the biggest driver for 5G applications, with 20.4 billion connected things in use worldwide by 2020. As one 5G base station can connect one million end devices per square kilometer, the technology is expected to fundamentally change the industry as well as people's lives.

But as Digitimes Research has noted, while 5G infrastructure deployments are expensive, and migration from 4G to 5G may not be as fast as expected, the real issue for players eyeing the huge market is how they can identify the application service markets to venture into. That is, they have to make a decision with regard to an "X as a Service" business model. The challenge for telecom operators in the 5G era is whether they have the ability to succeed in diverse vertical application markets.

Industry players could find inspiration from Computex, which this year will bring together leaders in the 5G industry such as Ericsson, Intel, Sigfox and Qualcomm to demonstrate their technologies and share their insights. The 5th Taipei 5G Summit will also be held alongside Computex.

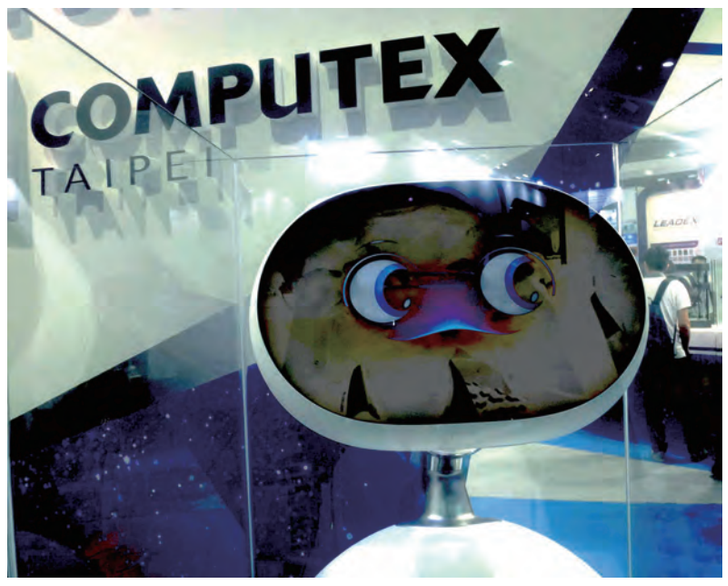
As for blockchain, much attention has been directed to cryptocurrencies, with the mining segment seeing months of feverish growth until a sudden chill hit in April. But there is so much more to blockchain than cryptocurrencies.

According to IDC – as cited by the Computex organizers – global spending on blockchain solutions is estimated at US$2.1 billion in 2018, more than double the sum of US$945 million spent in 2017. The financial sector will be the top spender on blockchain solutions, followed by the distribution and services sector in second place, and the manufacturing and resources sector in third.

Computex is bringing together leading players, such as IBM, Bitmark and Health2Sync, to discuss the opportunities for blockchain technologies. In the "Future Trends" forum, IBM will discuss changes and opportunities blockchain is bringing to the industry as it presents a brand new perspective on blockchain.

Visitors to Computex will also be introduced to latest development and trends in artificial intelligence (AI). Under the theme "Ubiquitous Intelligence," Computex will hold a forum featuring 15 speakers from IBM, Intel, Nvidia and other tech giants to talk about the latest AI developments.

Nvidia president and CEO Jensun Huang has noted that Taiwan may have started its AI development a bit late, but he expects its industries to step up investments in AI to increase their productivity and global competitiveness.



Earlier this year, Microsoft set up an AI R&D center in Taiwan, aiming to help the country sharpen its AI hardware and software development capabilities and establish its AI industrial ecosystems.

The IoT theme includes the special exhibit of SmarTEX, which will demonstrate products in seven categories: security, smart healthcare, Internet of Vehicles (IoV), smart wearables and sports technologies, AI and big data, smart tech solutions, and smart home and entertainment. Key exhibitors include Microsoft, Intel, Edimax, ECS, and Syscom Group, according to the organizers.

Computex has been placing a strong focus on innovations and startups in recent years, and this year the Innovations & Startups theme includes the InnoVEX showcase that features over 300 startups from 19 countries. Up to 40% of them are international teams, and one-third of these exhibitors are AI related, according to the organizers.

At the Gaming & VR zone, there will be cutting-edge products and latest developments in the gaming ecosystem from nearly 70 local and international exhibitors.

Consistent user experience: Q&A with Gigabyte Aorus brand chief Eddie Lin

Joseph Tsai, DIGITIMES, Taipei

Aorus Z370 Gaming 7 Core i+ motherboard

Aorus DDR4 XMP-3200 RGB Memory

Associate vice president for Aorus' brand marketing team, Eddie Lin

Following a business re-organization in the second half of 2017, Gigabyte Technology is now looking to unifying all its products under the Aorus gaming brand, seeking to bring a consistent user experience, according to sales and marketing associate vice president of Gigabyte's Gaming Product Business Unit and associate vice president for Aorus' brand marketing team, Eddie Lin.

To expand Aorus' penetration, Gigabyte also recently entered several new component and product business segments and will release a series of devices for each of them to answer customers' demand. Digitimes recently had a chance to chat with Lin about the company's operation, the company's plans for the gaming businesses, and the cryptocurrency business opportunity.

Q: What is the latest status of Gigabyte's Aorus gaming product lineup?

A: Although Gigabyte has just gone through a business re-organization, the company actually has not changed much in terms of the basic business structure. Most of the changes are in the business culture.

In the past, Gigabyte's product development strategy focused on individual projects: we would complete one project before moving on to the next. We identified features and technologies our gaming customers would want and implemented them into our devices.

Now, the new strategy is to think how our products can echo one another all under our Aorus gaming brand. For example, our motherboards, graphics cards, mice and keyboards should all have a unified industrial design to build up the feel they belong to the same series, and the same concept also applies to our software user interfaces and user experience.

Most importantly, this feel of a unified series should also echo what our customers are seeking in their gaming products. Simply put, we want to let our customers feel that their positive experiences using Gigabyte's products are consistent, so whatever values they are seeking in any of Gigabyte's devices can also be found in any of our other products.

Since Gigabyte has already merged the desktop and all its component businesses into a unified gaming business group, we expect the process of synchronizing our product lines to be much easier than before.

For Aorus, in addition to our existing product lines including notebooks, motherboards, graphics cards, keyboards, mice and other peripherals, we have expanded the brand's product portfolio to include new devices such as monitors, solid state drives (SSD) and DRAM.

As for the desktop, Gigabyte continues focusing on developing its Brix series mini-PCs.

Q: What are the company's goals for Aorus gaming products in 2018?

A: The year 2017 was the beginning year of our Aorus gaming brand and for the second year, Gigabyte's main targets are to further refine the series by listening to and understanding the needs of our customers; to work with the customers to enrich the gaming ecosystem; and to expand the series both horizontally and vertically.

For the vertical expansion, we have been strengthening our marketing resources and approaches to improve related contents and materials. We also have created a mascot to represent the Aorus spirit.

For the horizontal expansion, cultivating deeper into each region is Gigabyte's main focus. For example, the company has opened several Gigabyte flagship stores in China for demonstrating and selling Gigabyte's hardware. We are also partnering with Internet cafes in China, decorating them with Aorus themes as a form of promotion.

Meanwhile, Gigabyte continues taking aggressive approaches to supporting e-sport events and is scheduled to host Aorus Open PUBG Tournament 2018 in June and July with gaming competitions to take place in several major regions including China, Taiwan, South Korea, Germany, the US and France.

The company is also increasing its resources for sponsoring e-sport activities in 2018. Gigabyte sponsored a total of nine major gaming events in 2017 and the number will rise to 12 this year.

In addition to sponsorships for downstream e-sport players, Gigabyte also has new partnerships with Intel and Nvidia. Gigabyte is currently working with Intel to push Core i+ series motherboards that natively support Optane Memory. These motherboards all come with 32GB of Optane Memory for enhanced CPU performance.

Customers will also continue seeing Gigabyte's exclusive technologies including RGB Fusion with Digital LEDs, ESS Sabre reference DAC music chip with audiophile Grade capacitors and Ultra Durable components in their favorite Gigabyte motherboards.

However, we are not satisfied by simply adopting the best components into our products. Our target is to study customers' usage habits and improve our components to meet the habits.

Despite the business re-organization and the management changes, Gigabyte is still the same Gigabyte and our user-oriented business culture and emphasis on product quality remain the same.

We have also been forming partnerships with other enterprises for some interesting gaming-related projects. Apart from Arous Open PUBG Tournament 2018, which has helped us established partnerships with several enterprises, we have also collaborated with Electronic Arts (EA) to release an energy drink in Germany with Aorus and EA product images on the can.

We also have been in talks over many other projects, but it is not yet time to reveal the details about them.

In addition to physical products, we have many cooperation cases with game streamers worldwide for product promotions and are also investing resources to launch marketing campaigns with upstream and downstream partners.

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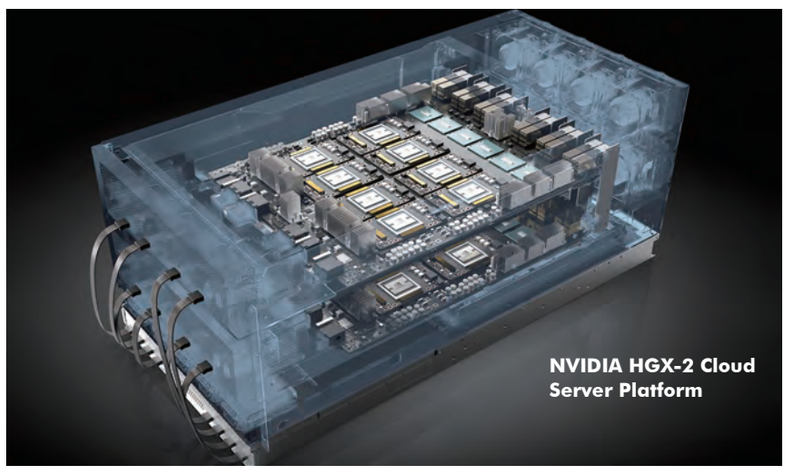
The New Era of GPU Computing Has Arrived

Sponsored content



NVIDIA HGX-2 Cloud Server Platform

NVIDIA's GPU Technology Conference (GTC) Taiwan attracted more than 2,200 technologists, developers, researchers, government officials and media last week in Taipei. GTC Taiwan is the second of seven AI conferences NVIDIA will be holding in key tech centers globally this year. GTC is the industry's premier AI and deep learning event, providing an opportunity for developers and research communities to share and learn about new GPU solutions and supercomputers and have direct access to experts from NVIDIA and other leading organizations. The first GTC of 2018, in Silicon Valley in March, hosted more than 8,000 visitors. GTC events are showcases for the latest breakthroughs in AI use cases, ranging from healthcare and big data to high performance computing and virtual reality, along with many more advanced solutions leveraging NVIDIA technologies.

GTC 2018 in San Jose debuted the NVIDIA DGX-2 AI supercomputing system, a piece of technology that AI geek dreams are made of. The powerful DGX-2 system is an enterprise-grade cloud server that combines high performance computing with artificial intelligence requirements in one server. It combines 16 fully interconnected NVIDIA Tesla V100 Tensor Core GPUs for 10X the deep learning performance compared with its predecessor, the DGX-1, released in 2017. With a 1/2 a terabyte of HBM2 memory and 12 NVIDIA NVSwitch interconnects, the DGX-2 system became the first single server capable of delivering 2 petaFLOPS of computational capability for AI systems. It is powered by NVIDIA DGX software stack and a scalable architecture built on NVSwitch technology.

In this interview, Marc Hamilton, NVIDIA's Vice President of Solutions Architecture and Engineering, talks about GTC and the development of Taiwan's technology ecosystem. He and his engineering team work with customers and partners to deliver solutions powered by NVIDIA artificial intelligence and deep learning, professional visualization, and high performance computing technologies. From many visits to ecosystem partners and developers, Hamilton is very familiar with the pace of AI development in Taiwan.

AI is dealing with HPC-class scaling problems

AI technologies elevate the enterprise by transforming the way we work, increasing collaboration and ushering in a new era of AI-powered innovation. AI solutions are rapidly moving beyond hype and into reality, and are primed to become one of the most consequential technological segments. Enterprises need to rapidly deploy AI solutions in response to business imperatives. The DGX-2 system delivers a ready-to-go server solution that offers the path to scaling up AI performance.

DGX-2 is designed for both AI and HPC workloads and simplifies the speed of scaling up AI with flexible switching technology for building massive deep learning compute clusters, combined with virtualization features that enable improved user and workload isolation in shared infrastructure environments. With this accelerated deployment model and an open architecture for easy scaling, development teams and data scientists can spend more time driving insights and less time building infrastructure.

For example, running HPC applications for weather forecasting means dealing with the massive scale of computation nodes. Forecasts are created using a model of the Earth's systems by computing changes based on fluid flow, physics and other parameters. The precision and accuracy of a forecast depend on the fidelity of the model and the algorithms, and especially on how many data points are represented. Computing a weather forecast requires scheduling a complex ensemble of pre-processing jobs, solver jobs and post-processing jobs. Since there is no use in a forecast for yesterday, the prediction must be delivered on time, every time. The prediction application is executed on a server node and receives reports from the monitoring programs distributed over the compute nodes.

Typically, these would be large distributed memory clusters, made up of thousands of nodes and hundreds of thousands of cores. Many HPC applications work best when data fits in GPU memory. The nature of the computations is built on interaction between points on the grid that represents the space being simulated, and stepping the calculated variables in time. It turns out that in today's HPC technology, the moving of data in and out of the GPU is more demanding in time than the computations performed. To be effective, systems working with weather forecasting and climate modeling require high memory bandwidth and fast interconnect across the system.

NVSwitch maximizes data throughput between GPUs leveraging NVLink

Memory is one of the biggest challenges in deep neural networks (DNNs) today. Memory in DNNs is required to store input data, weight parameters and activations as an input propagates through the network. Developers are struggling with the limited memory bandwidth of the DRAM devices that have to be used by AI systems to store the huge amounts of weights and activations in DNNs.

Having long relied on PCI Express, when NVIDIA launched its Pascal architecture with the Tesla P100 GPU in 2016, one of the consequences of their increased server focus for Pascal was that interconnect bandwidth and latency became an issue. The data throughput requirements of NVIDIA's GPU platform began outpacing what PCIe could provide. As a result, for their compute focused GPUs, NVIDIA introduced a new interconnect called NVLink.

With six NVLink per GPU, these links could be teamed together for greater bandwidth between individual GPUs, or lesser bandwidth but still direct connections to a greater number of GPUs. In practice this limited the size of a single NVLink cluster to eight GPUs in what NVIDIA calls a Hybrid Mesh Cube configuration, and even then it's a NUMA setup where not every GPU could see every other GPU. Utilizing more than eight GPUs required multiple systems connected via InfiniBand, losing some of the shared memory and latency benefits of NVLink and closely connected GPUs.

In a DGX-2 system, there are 16 Volta GPUs in one server. So NVIDIA introduced NVSwitch, which is designed to enable clusters of much larger GPUs by routing GPUs through one or more switches. A single NVSwitch has 18 full-bandwidth ports, three times more than a single Tesla V100 GPU, with all of the NVSwitch ports fully connected with an internal crossbar.

The goal with NVSwitch is to increase the number of GPUs that can be in a cluster, with the switch easily allowing for a 16 GPU configuration with 12 NVSwitch interconnect (216 ports) in the system to maximize the amount of bandwidth available between the GPUs. NVSwitch enables GPU-to-GPU communications at 300GB per second, which already has double the capacity from the DGX-1 (and the HGX reference architecture it's based on). This advancement will drive hyper-connection between GPUs to handle bigger, more demanding AI projects for data scientists.

NVIDIA wants to take NVLink lane limits out of the equation entirely, as using multiple switches should make it possible to build almost any kind of GPU topology in theory.

Deep learning frameworks such as TensorFlow don't need to understand the underlying NVLink topology in a server thanks to NVIDIA's NCCL (NVIDIA Common Collectives Library), which is used by TensorFlow and all leading DL frameworks. NVIDIA's AI software stack is fully optimized and updated to support developers using DGX-2 and other DGX systems. This includes new versions of NVIDIA CUDA, TensorRT, NCCL and cuDNN, and a new Isaac software developer kit for robotics. Hamilton highlighted the release of TensorRT 4.0, a new version of NVIDIA's optimizing inference accelerator. TensorRT 4.0 integrates with the TensorFlow 1.7 framework. TensorFlow remains one of the more popular deep learning frameworks today. And NVIDIA engineers know their GPU well and make TensorRT 4.0 software to accelerate deep learning inference across a broad range of applications through optimizations and high-performance runtimes for GPU-based platforms.

Hamilton mentioned lots of TensorFlow users will gain from the highest inference performance possible along with a near transparent workflow using TensorRT. The new integration provides a simple API that applies powerful FP16 and INT8 optimizations compiling TensorFlow codes using TensorRT and speed up TensorFlow inference by 8x for low latency runs of the ResNet-50 benchmark.

In edge computing, TensorRT can be deployed on NVIDIA DRIVE autonomous vehicles and NVIDIA Jetson embedded platforms. Deep neural networks on every framework can be trained on NVIDIA DGX systems in the data center, and then deployed into all types of edge devices. With TensorRT software, developers can focus on developing advanced deep learning-powered applications rather than taking time for fine tuning performance for inference deployment.

HGX-2 server platform as a reference design for cloud data centers

The DGX-2 server is expected to ship to customers in Q3 2018. Meanwhile, bringing together the solution expertise of Taiwan's ecosystem partners and global server manufacturers, NVIDIA announced the HGX-2 cloud-server platform with Taiwan's leading server makers at GTC Taipei. The NVIDIA DGX-2 server is the first system built using the HGX-2 reference design.

The server industry has been one of the few industries that have remained strong for Taiwan ODMs and increased opportunities in the AI field will help Taiwan system makers. NVIDIA engineering teams work closely with Taiwan ODMs to help minimize the development time from design win to production deployments. The HGX-2 is designed to meet the needs of the growing number of applications that seek to leverage both HPC and AI use cases. Those server brands and ODMs are designing HGX-2-based systems to build a wide range of qualified GPU-accelerated systems for hyperscale data centers.

The HGX-2 server reference design consists of two baseboards. Each comes equipped with eight NVIDIA Tesla V100 32GB GPUs. These 16 GPUs are fully connected through NVSwitch interconnect technology. With the HGX-2 serving as a building block, server manufacturers will be able to build full server platforms that can be customized to meet the requirements of different data centers.

NVIDIA AI collaboration in Taiwan

Hamilton says the areas of AI collaboration in Taiwan include hands-on training of 3,000 developers on leading applications of deep learning and providing high-level internship opportunities for Taiwanese post-doctoral students to work with NVIDIA engineering teams. The first AI hospital in Taiwan, sponsored by the LEAP program, which is supported by the Ministry of Science and Technology (MOST), is making it possible for doctors to see disease earlier and better understand it through advanced breakthroughs in AI.

Another case Hamilton highlighted is AI helping semiconductor foundries to identify wafer defects. The solution focused on using AI to sharpen the domestic semiconductor market's competitive position. The wafer defects detection system uses physics-based Instruments to examine the images of wafers by leveraging NVIDIA GPU-based optical neural network. The same idea has been modified for use in the printed circuit board (PCB) industries to make visual inspection of PCBs more accurate and give production line mangers a significant edge in discovering and resolving product issues.

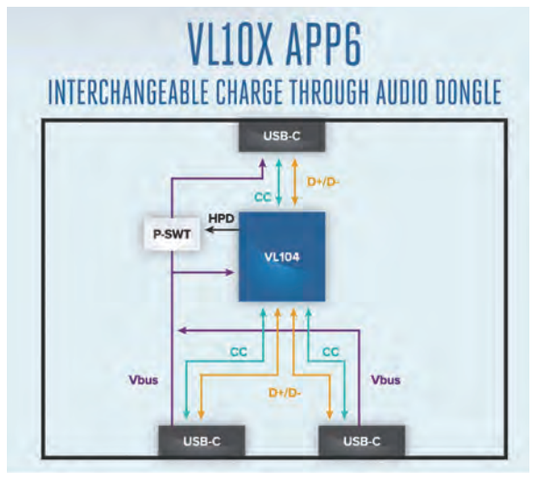
VIA Labs announces immediate availability of USB-IF certified Power Delivery 3.0 Silicon

Press release

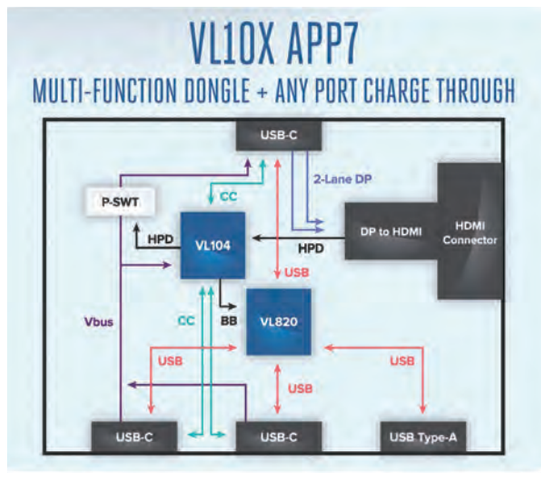
With the finalization of USB PD 3.0 Programmable Power Supply (PPS) protocol last year and mobile phones widely adopting USB-C interface, the unification of standard for mobile devices will not only drive fast charging opportunities, but also create new use cases and mobile device peripheral requirements. In response to the trend, VIA Labs Inc has taken the lead to launch certified USB PD 3.0 solutions, aiming to help customers quickly enter the market with complete reference designs.

"In order to fulfill the increasing needs for thinner and lighter phones, faster charging speed, and full-screen display, new mobile phones will not only adopt USB-C interface, but will also eliminate the traditional 3.5mm audio jack," said David Hsu, associate VP of Product Marketing, VIA Labs, Inc. "The trend will become prevalent gradually from high-end phones down to middle-range phones, which will definitely drive opportunities for new peripherals, such as USB-C headsets, dongles, and docking stations."

A mobile phone with only one USB-C port and no audio jack will create some use cases that are different from current consumer habits. The most common one is the need to charge and listen to music at the same time. Therefore, new types of peripherals are required to provide more convenient user experience. According to Hsu, "For a long time, peripherals have played the role of 'extending possibilities,' and VIA Labs is devoted to providing more use cases to further extend USB-C's diverse functions."



VIA Labs' VL104 supports APP6: Interchangeable charge through audio dongle



VIA Labs' VL104 supports APP7: Multi-function dongle + any port charge through

With the concept of 'Extending More Possibilities,' VIA Labs is committed to developing silicon solutions for various application scenarios, so that mobile phone makers can use them to create higher values and differentiated features for their peripheral devices, in a bid to meet consumers' practical application requirements and to create better user experience.

Take VIA Labs VL104 DisplayPort Alternate Mode controller as an example, it integrates one upstream USB-C port and two downstream USB-C ports to form one combination package, App6 reference design. The two downstream ports can support both charging and the headphone to enable intelligent interchangeable functions. It is a design that truly meets and even optimizes user experience. In addition, VL104 integrates buck-boost converter on a single chip to dramatically reduce the PCB size. As a result, designing more varied, compact and smaller peripheral devices has been made possible.

For USB-C power adapter applications, VIA Labs has introduced a highly integrated VP302 chip, which is optimized for next-generation USB-C wall charger and power adapter applications that support real-time finely adjustable voltage and current output. The new Programmable Power Supply (PPS) capability is the foundation for several new fast charging methods that promise not only more rapid charging, but also lower device temperature when compared to legacy methods. VIA Labs VP302 has obtained USB-IF PD 3.0 certification.

Before the specification of fast charging for mobile phones is unified, every mobile phone manufacturers will have their unique specification for fast charging. Though it is convenient in a short term, in a longer term it will cause damage to mobile phones due to adapter mismatch. After the finalization of USB PD 3.0 PPS protocol, we will see USB-C fast charging and manufacturers' own technologies coexist in the near future. It is expected that USB-C fast charging will eventually hit the mainstream as consumers get used to using any USB-C-based power adapter to support different brands of mobile phones.

Delivering 'combination-package solutions' based on application scenarios of consumer needs

In order to confront the fiercely competitive USB-C silicon market, VIA Labs chose to target at dongle and hub applications that were not so prevalent at the beginning. With correct strategy of emphasizing improvements to user experience and providing complete turnkey solutions, VIA Labs has successfully helped peripheral makers move into mass production quickly, and its products have also been adopted by Huawei, Nintendo and other internationally renowned manufacturers.

"We aim to provide combination 'packages' for various application scenarios. With the diverse functions of USB-C, we have developed seven reference designs for App1-App7 use cases, covering from simple video dongle, the combination of data, video, audio, and charging, to multi-function dongle with any port charging through. Now, the term, App1-App7, has become a common usage in the industry," said Hsu. "For example, VL104 can be used to support App6/App7 use cases. Just like ordering meals from MacDonald's, our customers can easily and quickly get their wanted designs by simply telling us the number (App1-App7)."

As the development of USB-C is taking off, creation value will be a key to success in the market. With the penetration rate of USB-C in mobile phones gradually increasing, phone makers will try to provide better standard peripherals to create differentiated features. Once consumers' habits are established, the demand for third-party peripherals will also rise.

To address the need, VIA Labs will strengthen cooperation with phone makers to further explore the mobile peripheral market by conceiving possible use cases and providing them with diverse design options.

For example, by fully leveraging the advantages of USB-C interface, docking stations can be used as an extension of voice assistant for mobile phones to enable the functions beyond listening to music and charging. This, again, demonstrates the concept of "Extending More Possibilities." Hsu is also optimistic that more new application scenarios and requirements for USB-C will pop up, and the business outlook for the market is very promising in 2019.

DIGITIMES Research

Global server market, 1Q18

Betty Shyu,
DIGITIMES Research, Taipei

Digitimes Research figures show that global server shipments totaled 3.4 million units (calculated based on motherboards) in first-quarter 2018, registering only a mild drop, thanks to weak seasonal impact during the traditional low season. Looking forward into second-quarter 2018, global server shipments are expected to show a 9% sequential increase with the market entering high season.

The share of server shipments by Taiwan-based vendors among the global total remained stable in first-quarter 2018. Although seasonal factors were not as significant as expected, overall shipments from Taiwan makers' shipments still exhibited a sequential decline. In the second-quarter high season, server demand from major customers led by large-scale data center operators such as Amazon and Microsoft is likely to grow sequentially.

Among Taiwan-based makers, Inventec still secured the top spot in first-quarter 2018. Both Inventec and Quanta received more orders from Amazon and Facebook in first-quarter 2018 than the quarter before. As to second-quarter 2018, Wywinn, bolstered by orders from two major customers – Microsoft and Facebook – will enjoy the highest shipment growth on quarter. Wywinn will also add a new customer – Amazon.

Component supply may be an issue that may undermine shipments of the server sector. Capacitors continuing to be in short supply will play an influential role on second-quarter server shipments.

First-quarter 2018 server shipments worldwide reached 3.4 million units, down only 1.8% on quarter. The mild sequential drop was in part a result of a low comparison base in fourth-quarter 2017, during which some customers such as Facebook and Amazon did not strongly ramp up orders.

Second-quarter 2018 server shipments worldwide are expected to increase 9% from the first quarter to come to 3.7 million units. Facebook, Amazon, Microsoft and Intel will likely sharply ramp up orders while demand from other large-scale data center customers will also show moderate growth.

With respect to the migration to new platforms, each vendor has its own timetable. In general, it is estimated Purley-based models will account for around 30% of second-quarter shipments.

Shipments breakdown

In the first quarter of 2018, Dell, HP and Super Micro remained the top three customers of Taiwan-based vendors, each receiving more than 400,000 servers. Shipments to the three customers in the first quarter all fell from the levels of the previous quarter due to the low-season effect. However, shipments to Dell and HP showed smaller decreases as they had reduced orders in the quarter before, resulting in lower comparison bases. Shipments to Super Micro exhibited a larger drop of 7% as it placed bigger orders last quarter. The top three together accounted for 42.4% of the global total, down from 43% of the prior quarter. Shipments to Lenovo presented the largest decline of 18% as it experienced weak sales.

During the second-quarter high season, server demand from major customers will likely show sequential growth with the most prominent increase coming from large-scale data center operators including Facebook, Amazon and Microsoft, each expected to have a 15-30% hike in demand.

The combined share held by Dell, HP and Super Micro will further drop to 41.5%, due to growing pressure from other vendors. Demand from Intel will be on the rise, up 15% sequentially to fall between 70,000 and 90,000 units. But shipments to Lenovo will probably continue on a downward trend, relegating the China-based vendor to a ranking below Inspur.

Shipments from Taiwan makers

Taiwan-based vendors shipped 3 million servers in the first quarter of 2018, accounting for 88.9% of the global total. Their shipments in the second quarter of 2018 are estimated to come to 3.3 million units and the share will edge up 0.5pp, thanks mainly to significant growth in shipments by their customers.

Server providers (considering only motherboard manufacturers) based outside Taiwan include only EMS such as Huawei, Generaltec (Tianjin) and Celestica. Shipments by Huawei exhibited a steady growth in the first quarter, causing the share of Taiwan-based vendors to edge downward. Generaltec, shipping mainly to Inspur, delivered 50,000 servers in the first quarter but its second-quarter shipments will drop to 40,000 units. EMS providers cannot compete with Taiwan-based vendors on pricing and therefore ship only a small quantity of servers.

Despite the first-quarter low season, shipments by Inventec, Foxconn, Wywinn and Quanta all showed slight increases from the prior quarter. Inventec remained the top supplier, accounting for 22.5% of total shipments by Taiwan-based vendors. But Wistron, sustaining heavier impact from seasonal factors, shipped 12% fewer servers compared to the last quarter and its share edged down to 16.1%.

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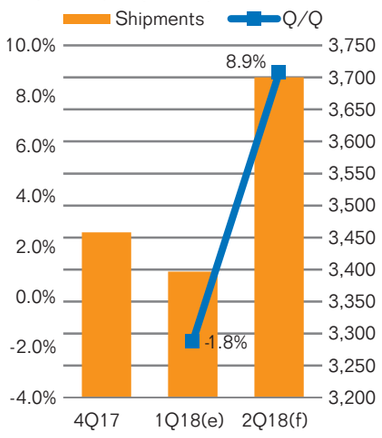
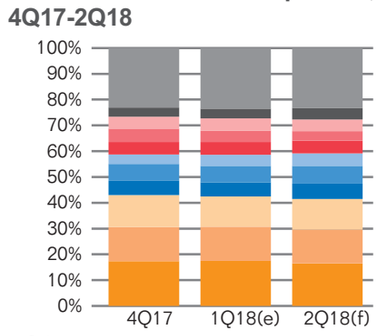
Global server market shipments, 4Q17-2Q18 (k units)



Source: Digitimes Research, April 2018

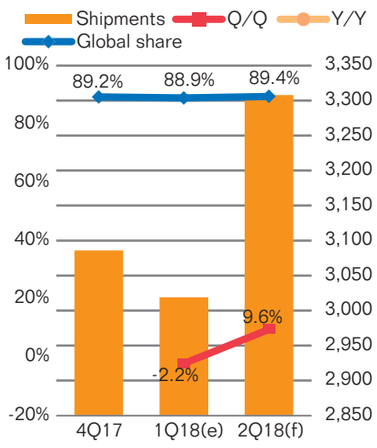
Global server market shipments, 4Q17-2Q18



	4Q17	1Q18(e)	2Q18(f)
Others	23.0%	23.5%	23.2%
Inspur	3.6%	3.8%	4.5%
Google	4.6%	4.8%	4.5%
Lenovo	5.2%	4.3%	3.7%
Huawei	4.8%	5.0%	4.9%
Facebook	3.7%	4.2%	4.9%
Amazon	6.5%	6.4%	6.8%
Microsoft	5.5%	5.5%	5.9%
Super Micro	12.4%	11.8%	11.9%
HP	13.3%	13.2%	13.1%
Dell	17.3%	17.5%	16.5%

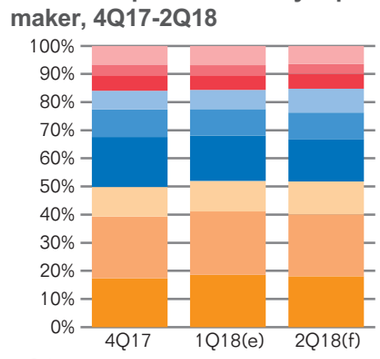
Source: Digitimes Research, April 2018

Taiwan server shipments and global share, 4Q17-2Q18 (k units)



Source: Digitimes Research, April 2018

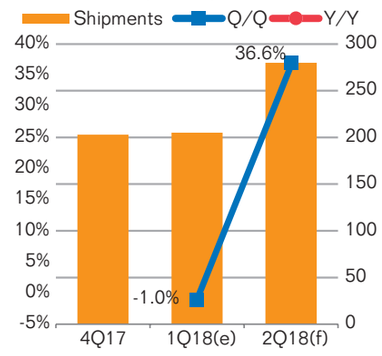
Taiwan shipment share by top maker, 4Q17-2Q18



	4Q17	1Q18(e)	2Q18(f)
Others	6.6%	6.8%	6.4%
OSE	3.9%	3.6%	3.5%
USI	5.5%	5.2%	5.3%
Wiwynn	6.6%	6.8%	8.5%
Mitac	9.8%	9.4%	9.4%
Wistron	17.8%	16.1%	15.1%
Quanta	10.6%	10.9%	11.7%
Inventec	21.9%	22.5%	22.1%
Foxconn	17.3%	18.6%	18.0%

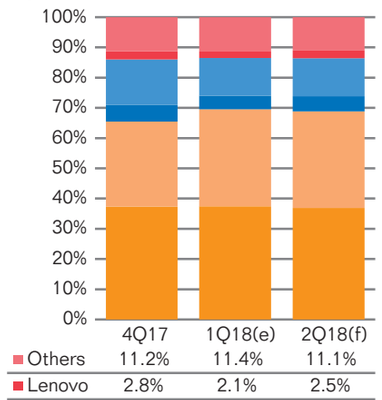
Source: Digitimes Research, April 2018

Wiwynn server shipments, 4Q17-2Q18 (k units)



Source: Digitimes Research, April 2018

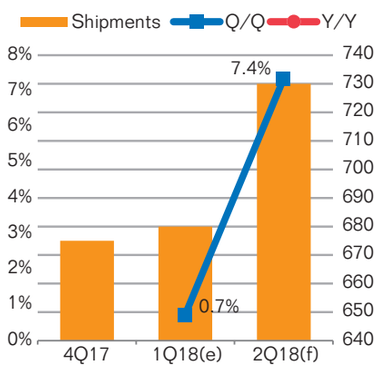
Foxconn shipment share by client, 4Q17-2Q18



	4Q17	1Q18(e)	2Q18(f)
Others	11.2%	11.4%	11.1%
Lenovo	2.8%	2.1%	2.5%
Amazon	15.0%	12.5%	12.6%
Microsoft	5.6%	4.5%	5.0%
HP	28.0%	32.1%	31.9%
Dell	37.4%	37.4%	36.9%

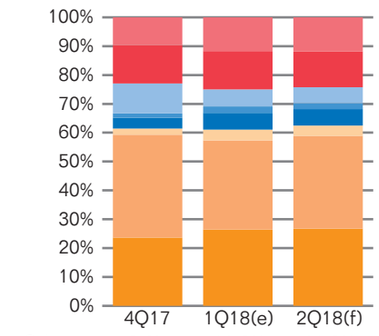
Source: Digitimes Research, April 2018

Inventec server shipments, 4Q17-2Q18 (k units)



Source: Digitimes Research, April 2018

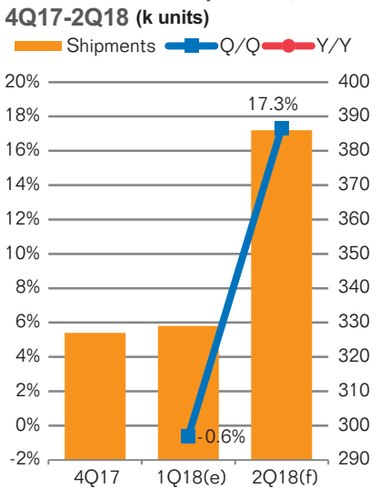
Inventec shipment share by client, 4Q17-2Q18



	4Q17	1Q18(e)	2Q18(f)
Others	9.6%	11.8%	11.9%
Google	13.3%	13.2%	12.3%
Lenovo	10.4%	5.9%	5.5%
Facebook	1.5%	2.2%	2.1%
Amazon	3.7%	5.9%	5.8%
Microsoft	2.2%	3.7%	3.6%
HP	35.6%	30.9%	32.2%
Dell	23.7%	26.5%	26.7%

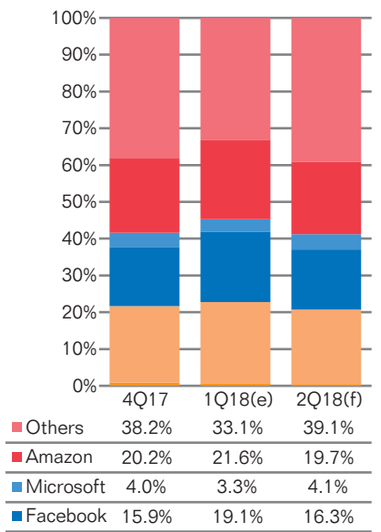
Source: Digitimes Research, April 2018

Quanta server shipments, 4Q17-2Q18 (k units)



Source: Digitimes Research, April 2018

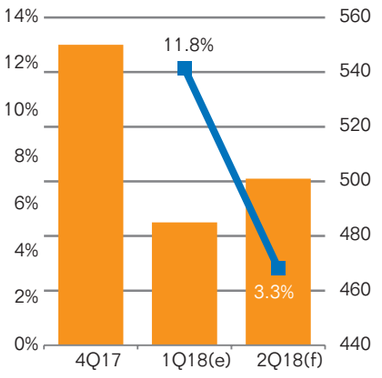
Quanta shipment share by client, 4Q17-2Q18



	4Q17	1Q18(e)	2Q18(f)
Others	38.2%	33.1%	39.1%
Amazon	20.2%	21.6%	19.7%
Microsoft	4.0%	3.3%	4.1%
Facebook	15.9%	19.1%	16.3%
Google	20.8%	22.2%	20.2%
Dell	0.9%	0.6%	0.5%

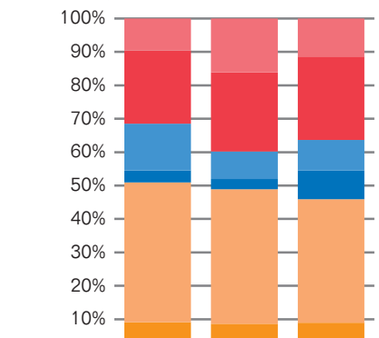
Source: Digitimes Research, April 2018

Wistron server shipments, 4Q17-2Q18 (k units)



Source: Digitimes Research, April 2018

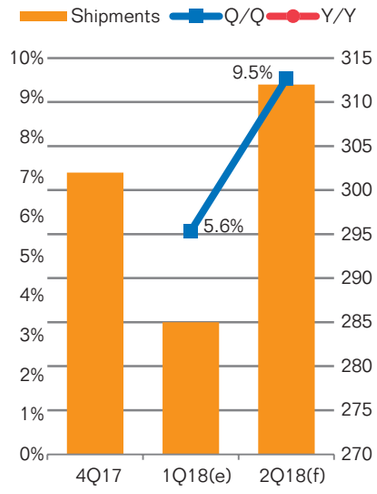
Wistron shipment share by client, 4Q17-2Q18



	4Q17	1Q18(e)	2Q18(f)
Others	9.6%	16.1%	11.4%
Super Micro	21.8%	23.7%	25.0%
Lenovo	14.0%	8.2%	9.2%
Inspur	3.6%	3.1%	8.6%
Dell	41.8%	40.2%	36.9%
HP	9.1%	8.7%	9.0%

Source: Digitimes Research, April 2018

Mitac server shipments, 4Q17-2Q18 (k units)



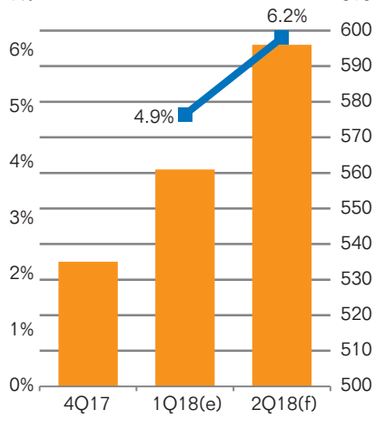
Source: Digitimes Research, April 2018

Mitac shipment share by client, 4Q17-2Q18

	4Q17	1Q18(e)	2Q18(f)
Others	66.9%	66.7%	59.9%
Amazon	18.2%	12.3%	14.4%
Inspur	14.9%	21.1%	25.6%

Source: Digitimes Research, April 2018

Foxconn server shipments, 4Q17-2Q18 (k units)



Source: Digitimes Research, April 2018

CWT combines forces with eTreego to optimize charging piles' efficiency amid rapidly growing electric vehicle market

Sponsored content

The growing awareness on environmental protection and energy conservation has prompted governments worldwide to enforce energy efficiency policies. With the development of electric vehicles (EV) as one of their priorities, many countries are now planning on a timeline between 2020 and 2040 to ban new fossil-fuel cars' sales. Worldwide efforts to promote EV adoption have introduced immense opportunities, attracting many Taiwan high-tech players to launch into the market. Channel Well Technology (CWT), with years of experience in the power supply business, is also making active efforts in the R&D of EV charging pile equipment. Wei-Ting Ou, who's in charge of CWT's EV charging pile department, points out that most people tend to think Taiwan-based manufacturers focus more on developing technologies for EV body structures, however, achievements they've accumulate in charging pile industry is in fact another rising star.

CWT engages in collaborations with the startup eTreego by providing interior power supply systems to be integrated into its charging piles. Most charging stations currently on the market can only support a few cars once and may have difficulties satisfying demand in high traffic areas. eTreego's charging pile on the other hand offers a chance to reduce the contract capacity of the charging station through non-uniform charging technology. For eTreego's piles, aside from critical control modules, rely heavily on interior robust power supply technologies. With this need, achievements through long-term devotion in power supply have allowed CWT to be the perfect match.

Overall grow of the EV industry did not advance as expected for the past for reasons as follows.

First of all, due to competitions among leading international automakers, the Taiwan market had not unified EV charging standards during EV industry's early-stage, which led to holdbacks of domestic manufacturers, resulting in longer R&D cycles. Furthermore, consumers generally have the impression that EVs run out of power quickly. Long charging time and insufficient charging stations are additional factors that hinder EV's growth.

However, EV's market is picking up its speed, and the explosive growth can be expected, especially driven by government policies, according to Ou. This is also the main reason why leading companies are scrambling for a share of the market. Taiwan's EV standards and regulations are close to its completion. EV battery life has greatly improved from a 100km range to 300km or above. There are DC charging stations that can charge an electric car's battery to its 80% in less than 40 minutes.

On the other hand, for prolonging the battery life purpose, AC charging generally requires 4 to 12 hours which is recommended that EV owners charge their vehicles at home overnight. In brief, convenience and feasibility of EV charging have significantly improved.

The growing EV infrastructure market is now creating rising opportunities and in the years to come to those who are well prepared. To capture these opportunities, CWT has taken the initiative not only to work on its own power supply research but also to engage in joint developments with eTreego in an attempt to gain a strong foothold in the EV charging equipment market.

Wei-Ting Ou, in charge of CWT's EV charging pile department, expects flourishing opportunities as government policies promote EV adoption worldwide. Photo: Digitimes

Clientron showcases multiple innovations of thin client, POS and embedded IPCs

Press release

Clientron Corp, a global leading provider of thin client, POS and embedded systems, is introducing its latest products with multiple innovations at Computex 2018. The products demonstration of various industrial applications include embedded IPCs for food processing industry, the streamlined thin clients in banking scenario, and POS terminals for restaurant setting solution. The complete product series of Clientron thin client, POS terminal, and embedded IPCs are on exhibit at booth K0427a at Taipei Nangang Exhibition Hall 1.

Seizing the trend of IoT and Industry 4.0, Clientron is ramping up efforts toward IPC product development and market expansion. Kelly Wu, president & CEO, Clientron, stated, "Taiwan-based manufacturers have been active in the IPC market for many years. IPC firms are characterized by being small but exquisite. Clientron, with years of embedded product design, production, and service offering experiences, is capable of providing high-end industrial-grade products with wide temperature and voltage ranges, waterproof and dustproof as well as ability to maintain long-term operation under extreme circumstances."

For the IPC product line, Clientron introduces its brand new products including single board computers (SBC), embedded systems and industrial panel PCs to accommodate different customers and vertical market demand. At the show, Clientron's Pike-AL-1500SP, crafted specifically for the food processing industry, is an industrial panel PC offering IP69K protection against high temperature and dust. The Pike-AL-1500SP has passed spray test with steam pressure of 100bar (1450 psi) at a temperature of 80 degrees C. It is built with grade 304 stainless steel casing to enable protection against heat and corrosion and prevent hazardous substances from leaching due to heat or acid, thereby guaranteeing safe and sanitary operation in a food processing plant. For factory automation and parking solution, the Mace-AL-200 embedded system provides "Tsuba Kits" with a flexible modular design for customers to easily add I/O modules and build systems tailored to their specific needs.

In terms of Clientron's most renowned thin client product line, Clientron is showcasing a complete lineup of thin clients from entry-level, mid-range, high-end and up to high performance IP40 industry thin clients. Clientron debuts several new thin client models including the cost-effective S-cube Pi3 B+, running on Raspberry Pi3 B+ platform with ultra-lightweight 0.18L volume, and ultra-low power operation below 3W on average. The S-cube Pi3 B+ thin client supports the most used of the connection protocols, including RDP, HDX, and VMware Horizon. It has one HDMI display, WiFi and Bluetooth wireless connectivity, and is suitable for education, financial counter, and others that require simple tasks. For the mainstream thin client segment, Clientron's brand new S810, is equipped with Intel's next-generation Gemini Lake Celeron power-efficient quad-core processor, providing dual display outputs, M.2 high-speed interface, and supporting innovative POF (Port-on-Foot) I/O expansion ports for more easily and flexibly expand to meet different field and application requirements. For high-end and flexible thin clients, the F620 features 4K definition and supports up to quad displays to meet the requirements of the healthcare and multimedia sectors. In addition to stand-alone thin clients, Clientron provides a new generation of all-in-one thin client TC220 with 21.5-inch capacitive multi-touch, and also uses Intel's new generation Gemini Lake Celeron quad-core processor, which targets at medical care solution, financial markets and more applications. Furthermore, Clientron is displaying its entire POS product portfolio. For all-in-one POS terminals, Clientron is presenting PST650 suited for the food service industry. The PST650 features streamline, compact and lightweight design and built-in thermal printer integration supporting multiple well-known printer models, saving counter footprint and cost. Another focus on the show is the PT2000 POS terminal, aiming at cost-effective product segment with valuable benefits supporting multiple peripheral solutions to enhance user experience. Also at the show are a variety of the extended POS peripherals.

Clientron showcasing its IPC products at Computex

Meanwhile, Clientron is exhibiting multiple innovative products, of which the R800 thin client was recently recognized with the 26th Taiwan Excellence Award.

The Bello, Wing, Ares series of fanless multi-functional POS terminals also have won the Taiwan Excellence Award. There are also newly introduced embedded IPCs to highlight Clientron's capability of meeting the needs of multiple customers.

Cayin brings digital signage alive to retail at Computex 2018

Press release

Cayin Technology, a digital signage solution provider, will take part in Computex 2018. Located in the Business Solution and Smart Retail section of the tradeshow, Cayin will introduce a few trendy integrations to help digitizing in-store experience and management, including audience measurement, indoor air quality monitoring, and customer interactions.

Partnering with Quividi - a global leader in digital signage analytics and interactivity - Cayin will bring together an interactive advertisement solution. Quividi provides a privacy protecting computer-vision technology that helps screen networks, retailers, and brands, finely measure and classify their audience, understand the performance of their content, and support audience-aware experiences, using real-time data to make creative and messaging more engaging and effective.

Two screens will be showcasing the intelligent interactive solution. The first one will showcase examples of adverts that can be contextually triggered against the profile and behavior of the audience, while the second one will show the wealth of data collected by the platform.

Most countries have regulations regarding air quality standards within confined commercial spaces. Customers, especially parents with young children, also pay more attention to and want to be informed on those conditions these days. By merging indoor air quality (IAQ) monitors with digital signage, Cayin provides a solution that will give customers a reassuring shopping environment.

Interactive solutions often create better customer engagements, and by incorporating digital signage into the mix, retailers can save on labor costs as well.

Gearing efforts toward special-purpose power supplies: An interview with APD executive Rax Chuang

DIGITIMES staff

Leveraging robust R&D capabilities as well as manufacturing and customization flexibility, APD Group's long-term efforts toward the power supply market are generating results, allowing it to build up a significant presence in the global network, IT, consumer product and healthcare application markets. Many well-known world-class companies engage in long standing collaborations with APD, according to Rax Chuang, general manager, APD Power System Business Group.

Implementing the DFSS approach, APD upholds premium quality

APD's customization design capabilities are already market proven and its impressive achievements are backed by powerful R&D strength. Attaching great importance to research and development, APD employs an engineering team of more than 300 employees, representing 17% of its staff, and also allocates more than 5% of its annual revenue to research and development every year. Furthermore, to bring its critical product and manufacturing technologies to a whole new level, APD has fully engaged in Design for Six Sigma (DFSS) certification so that APD R&D engineers will implement systematic approaches throughout the product development cycle from initial design to volume production, delivering premium quality and guaranteeing high reliability of APD products.

It should be noted that although R&D strength, customization design and manufacturing flexibility are no doubt the most important factors leading to APD's recognition by international customers, the fact that APD takes corporate social responsibility (CSR) to heart also helps it win long-term partnerships with American and European companies.

As a matter of fact, APD recently received the bronze medal award from Deutsche Telekom in recognition of its CSR achievements in labor issues, health and safety, environmental protection, code of ethics and management system.

Stepping up efforts toward the healthcare market

In terms of market expansion efforts, power supply vendors have been eyeing the healthcare sector as profit margins on power supplies for IT and consumer products continue to narrow. However, the conservative healthcare market imposes stringent requirements on safety and puts up a high barrier barring quick and easy entry. "We have been putting efforts in the healthcare sector for more than a decade. APD has accumulated competitive advantages that other vendors won't be able to match anytime soon," stated Chuang.

APD's efforts toward the healthcare sector have allowed it to obtain certifications for compliance with ISO 13485 Medical Devices Quality Management Systems Standards and IEC 60601 Safety Requirement for Medical Equipment, demonstrating APD products' high quality, high reliability and high safety standards fully meet the healthcare sector's demanding requirements.

APD now mainly provides premium quality power supplies for medical equipment including resuscitators, nebulizers and blood pressure gauges. Take resuscitators for example. Chuang emphasized that requirements on medical-grade power supplies with respect to protection against noise, electromagnetic interference and water are far more demanding than IT- and consumer-level power supplies. With years of continuing efforts in refining medical-grade power supply quality to keep up with diverse and stringent safety requirements, APD has engaged in collaborations with leading European, Australian and Japanese medical equipment providers. This is certainly a recognition of APD's R&D strength for medical-grade power supplies.

Going forward, APD will ramp up efforts toward the China healthcare market. "The China healthcare market is full of potential and multiple vendors are still competing for dominant market shares. APD will strive for early entrance and reap first-mover advantages," remarked Chuang. As part of such efforts, APD participated in China International Medical Equipment Fair (CMEF) 2018 and received positive responses. Its capability to provide flexible custom-designed medical-grade power supplies has caught market attention and APD expects this will lead to multiple partnership deals.

State-of-the-art labs help customers shorten time-to-market

For the purpose of implementing full control on the quality of power supplies for medical equipment and other devices and also helping customers accelerate time-to-market around the world, APD has devoted tremendous resources to building the most advanced safety laboratories in the industry, including a UL lab and an EMC lab. Such establishments allow APD to keep abreast with the latest industry standards including IEC/EN/UL 62368, IEC/EN/UL 60950-1 and IEC/EN/UL 60065 in terms of product safety, EMC, energy efficiency and certification tests. Chuang specifically pointed out, "The significance of these state-of-the-art labs being in place is that APD's system operation and engineering capabilities can be 100% trusted."

Rax Chuang, general manger, APD's Power System Business Group

Commenting on the company's long-term outlook, Chuang affirmed, "APD will continue to focus on R&D of critical technologies, refine customization design capabilities and raise manufacturing efficiency to provide worldwide customers with the most competitive power supply products and services and establish itself as a leader in its target market segment."

At Computex 2018, APD will showcase a diverse range of power supplies for network communication devices, consumer electronics and medical equipment as well as custom-made power supply solutions. Visitors are welcome to the APD booth for more information.

Innodisk tackles SSD data retention challenges in high temperature

Press release

Flash memory is a non-volatile storage medium. This means that data remains on the solid state drive (SSD) without power. There are however certain factors that can lead to data loss and data degradation.

Data retention: Temperature and P/E cycles

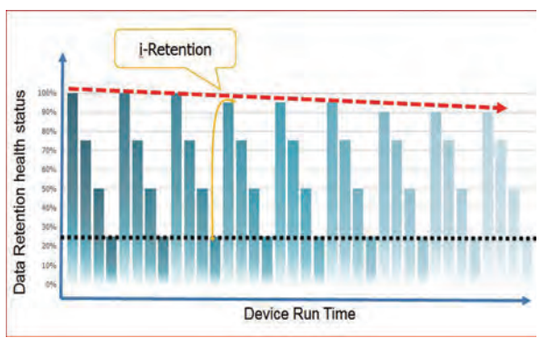
High temperatures and frequent program/erase (P/E) cycles can both severely impact data retention. Every cell inside flash traps a negative charge that represents a binary value (e.g. 01, 10 etc.). These cells are generally very good at holding on to this charge, but every now and then some of the charge will leak out. Error correction code is normally very good at picking this up and fixing the problem.

High temperatures will, however, speed up the rate of leakage. Testing shows that the data retention of standard MLC flash decreases 168-fold when moving from 40 degrees C to 85 degrees C. This means data that would normally last two years, will experience issues in only five days. The problem is further exacerbated as the number of P/E cycles increases, meaning that SSDs in heavy-writing environments are particularly at risk.

iRetention

Innodisk's new iRetention technology tackles this problem through smart firmware and hardware innovations. An onboard sensor will constantly monitor temperatures, which along with the P/E cycle number is used to calculate how often to refresh the data. This is all handled by the SSD itself and will self-adjust to changes in the environment.

iRetention is perfect for devices that see extreme temperatures and thermal variation. This makes it suitable for application such as in-vehicle, automation, food processing, and aerospace and defense. Innodisk will showcase iRetention during Computex, June 5 to 9, at Nangang Exhibition Center, booth#J0618.



iRetention will periodically refresh data as data retention drops in challenging environments

Innodisk's most reliable mainstream MLC solution

Liyitec pioneers curved, profile-cut, anti-explosion touch screens and cover glass

Press release

Dedicated to manufacturing industrial grade touch screen and cover glass products, Liyitec is headquartered in the Guishan Industrial District, northern Taiwan, with two factories to satisfy customer's one-stop shopping requirements – from font-end process such as glass cutting, polishing, surface treatment, to back-end process such as touch screen module manufacturing and lamination.

With its major customers in Japan, Europe, the US and Taiwan, Liyitec's products cater to various areas – industrial, automotive, aviation, marine navigation, medical, educational, outdoor digital signage and gaming applications – to meet the demand of highly customized needs for different kinds of customer. The development of industrial products is different from that of consumer ones. In order to ensure the reliability and quality, the design, manufacturing and validation of industrial products are much more stringent and complicated, taking much longer than those for consumer products. All these efforts ensure that once the product is designed-in, it will be more difficult to be replaced by competitions. Although industrial products are usually characterized by clients placing orders of lower quantities compared to those for consumer devices, the orders are longer-term and more stable. Being able to provide long-term support and reliable products are important responsibilities and missions of a manufacturer who dedicates to industrial products. These are main reasons why Liyitec has been able to sustain its business for 30 years, accumulating so many long-term partnerships with customers.

The products of Liyitec are touch screen modules and cover glasses. They can be divided into flat type, curve type and profile-cut type. Products are sized from 5-inch for handheld device to 65-inch for outdoor digital signage or white board. Liyitec has its own production team equipped with cutting and CNC machine to satisfy automotive customer's profile-cutting demand. It is worth mentioning that, for the automotive industry, outdoor digital signage and gaming industry, in order to create high added value, more and more diverse products, including curved products, are starting to appear in the market. Liyitec is the market leader of curved type products capable of making single and multiple curvatures.

To satisfy the safety demand in automotive, aviation, marine or outdoor applications, safer products are needed in the market. The anti-explosion products ensure that, when the product is hit with tremendous force and breaks, the glass will not shattered into pieces and will still stick together as a whole to prevent hurting users, like the safety glass of car windshields. Liyitec is a pioneer in the industry to introduce anti-shatter PVB in its anti-explosion and anti-UV touch screen to protect users. Also, Liyitec offers AG (anti-glare), AR (anti-reflection) and AF (anti-fingerprint) surface treatments to spare clients from multiple outsourcing for different processes – a service that satisfy customer's one-stop shopping demand.

Liyitec's 65-inch anti-explosion and anti-shatter touch screen

J-type curved touch screen

Liyitec will exhibit its products at Computex 2018 (TWTC Hall 1, Touch Applications & Display Products C0620) including medium- to large-size flat, curve, profile-cut, anti-explosion touch screen as well as cover glass to satisfy all kinds of customization needs.

SECO cross-platform designs bring AI power to embedded systems

Sponsored content

Artificial intelligence (AI) and Internet of things (IoT) are seeing explosive growths. Obviously, things like deep learning are quite exciting, and they are starting to impact various aspects of people's daily lives.

Service providers are opening up cloud infrastructures for smart applications at a rapid pace. The advent of increasingly powerful processors, wireless communication technologies and sensors offer new design concepts for embedded systems. With such advances come new business opportunities for embedded system makers and solution providers. The AIoT era is coming.

Smart embedded systems and AIoT solutions are getting complicated. Apart from faster Internet connection and interconnectivity between network nodes, the performance of embedded systems is ramping up substantially. And the trend towards high level integration of the embedded systems raises the bar for solution providers.

Founded in 1979, SECO is an Italy-based leading embedded system and industrial solution provider with complete control over the entire design cycle to mass production of embedded solutions. The company designs standard solutions as well as custom embedded systems to meet specific needs of customers. After almost 40 years with a core capability of strong vertical system integration, SECO maintains long-term partnerships with both x86-based CPU/APU and ARM-based chip makers. SECO offers product lines powered by AMD, Intel, NXP, Nvidia, Qualcomm and TI embedded processors. In a recent interview, Gianluca Venere, SECO Director of Global Sales & Chief Strategy Officer, explained the company's global strategies for developing embedded system market sectors and its further business development in Asia region.

Gianluca Venere, Director of Global Sales & Chief Strategy Officer, SECO

One of the most well-known product lines of SECO is its computer on module (COM). It embraces a cross-platform philosophy with a modular design aiming to provide flexibility of switching between different CPU/APU with the same form factors. Whether it is switching from x86 to ARM-cored CPUs, or changing different grades of ARM-cored microprocessors to tackle cost concerns, SECO's cross-platform carrier boards give the freedom of switching CPUs without adjusting any dual inline package switch (DIP switch) or changing jumper settings. The beauty of this design comes from the similar concept of seamless transformation satisfying diverse applications with intensive computing requirements in various embedded systems, enabling both extreme flexibility and vast scalability.

Today, this cross-platform design has been extended to support FPGA chips, Venere stressed. Customers could change between FPGA chip vendors such as Xilinx and Altera. As far as the promising AIoT and edge computing are concerned, intelligent medical solutions are just beginning to take off, and edge computing powered by AI-enabled FPGA chips is even more exciting. With the advantage of flexibility, fast speed and low-power consumption, FPGAs have been rapidly catching more attention from smart medical solution providers, Venere highlighted.

FGPA technologies have advanced to the point where engineers can build much larger, more complex chips with pre-built modules for anything from processor cores to custom algorithm accelerators. Leveraging the on-the-fly reconfigurable nature of FPGAs, SECO has implemented the new design with hardware-software integration to meet customers' requirements.

Besides FPGA technology support, the cooperation with Wind River, a global leader in embedded software and a real-time operating system vendor, also helps SECO provide complete embedded solutions to customers.

As the center of the global economy gradually moves from the west to east, attention is shifting from mature to emerging markets. With the unique strength of cross-platform technology to provide customers with flexible and fast time-to-market solutions, SECO has been servicing the fast growing Asian markets since 2012.

Medical solutions are currently a key focus of development. Although it will take time to build relationships with targeted first-tier partners/customers in Japan and South Korea, Venere still feels very optimistic because of SECO's complete range of embedded system solutions.

To establish a strong presence in Asia, SECO will establish a solution development center in Taiwan in 2019. This is an important investment for linking with Taiwan's IT talent and industry, and providing support for customers in Asia.

SECO is showcasing its products at Computex 2018, at Nangang Exhibition Hall 1, Booth K0102. On display are solutions in SECO's Qseven, COM Express and SMARC product lines. SECO welcomes visitors to its booth to get first-hand experiences of its products.

IoV, AI and embedded computing are essential to the development of autonomous driving

DIGITIMES Staff

American and European market trends have always steered automotive industry developments. The same is true for the new generation self-driving vehicle sector, where American and European firms generally lead the way in the development of technologies, policies and certification standards and are often the first to put forth related solutions.

With respect to autonomous driving and advanced driver assistance system (ADAS) technologies, American and European countries have mature industrial environments and markets. Also with burgeoning IoT applications, their complete industry ecosystems foster advanced applications of autonomous and smart automotive technologies.

Self-driving vehicles making quantum leaps

In terms of market trends, US and Japan automakers have been the most aggressive in real-world applications of self-driving vehicles. For example, Japan plans to bring self-driving taxis to the 2020 Tokyo Olympics. Waymo, the self-driving Google spinoff, looks to kick off its ride-sharing service in 2018. Commercial self-driving vehicles are only a matter of time and may get on the road within one year.

As to the American autonomous driving market, Waymo has secured approval from the state of Arizona to operate as a transportation networking company (TNC), which may be the first commercial self-driving vehicle service. Operators of the service have been ramping up efforts and undertaking acquisitions of high-end sensor and embedded AI computing companies, reaffirming Waymo's plan to gear toward commercial self-driving services.

Vehicle-to-everything (V2X) communication technologies enables self-driving vehicles to access more complete and instant road condition data.
Source: Qualcomm

Embedded computing and high-end IMU are critical to autonomous driving

The core components to a self-driving vehicle include sensing technologies (3D modeling/analysis), automotive radars, automotive sensors, high-end inertial measurement unit (IMU) and embedded computing processors.

High-end IMUs are particularly important to the development of smart self-driving vehicles. IMUs measure 3D angular velocity and acceleration of an object using built-in gyroscopes and multi-axis accelerometers and thereby further analyze the object's actual movement. High-end IMU modules integrate additional sensors along each axis, such as magnetometers and barometers, to help with the calculations and provide more accurate results. It may not be necessary to incorporate high-end IMUs in ADAS for mid-tier or low-end vehicles but they are essential to smart self-driving cars.

ADAS

Smart autonomous driving systems being developed by leading automakers such as Tesla and Volvo are mostly just an ADAS or a somewhat more advanced driver assistance solution. They are not yet a highly developed self-driving technology and are no match for Google's Waymo self-driving project (robocar). They differ a lot in terms of the integration complexity of the embedded systems and maneuvering systems. Critical components, such as sensors and cameras, integrated in Waymo's self-driving cars cost 10 times those of ADAS-based self-driving vehicles. In particular, Waymo's self-driving cars use high-end IMUs with sensing capability and analytic performance far surpassing those of ADAS.

Fleet owners or transportation network operators currently engaged in autonomous vehicle development mainly include Waymo, Uber and Lyft as well as international automakers GM and Ford. They are venturing into autonomous driving mostly because they think a high-level integration of self-driving, embedded analytics and computing as well as sensing technologies can replace human drivers and make self-driving services with enhanced safety, reduced labor and increased efficiency a reality. Not only will they profit from such services but they will also contribute to road safety and transportation efficiency.

Similar to the market development of most high-tech products or technologies, pioneers are in a better position to reap the largest benefits from profitable commercialization of self-driving vehicles, especially the B2B segment that provides higher profit margins and a stable revenue base. First movers to the autonomous driving market will be able to raise more capital, build road and network infrastructures and develop embedded computing and sensing technologies for autonomous driving, thereby profiting from in-depth penetration into these segments.

Aggressive efforts toward commercial self-driving services

Self-driving vehicles are all about how they can quickly and accurately detect what's happening on the road and make analyses. Technological advances in embedded analytics and computing as well as automated control are adequate in handling road condition analyses and taking responsive actions. The bottleneck for self-driving vehicles now is how to integrate environmental sensing technologies while keeping the costs down. For personal-use or even commercial-use self-driving vehicles to go to market, they have to be able to show comparable or even better cognitive abilities than drivers without human intervention.

European, American and Japanese automakers make aggressive efforts toward self-driving vehicles with a goal to improve road safety. Human drivers can at best detect road conditions within sight and are susceptible to fatigue and distractions by passengers or entertainment in the vehicle as well as traffic on the road. On the other hand, self-driving vehicles using high-end IMUs coupled with vehicle-to-vehicle (V2V) communication and vehicle-to-infrastructure (V2I) communication not only can detect road conditions beyond human vision but also have access to the status of other cars and real-time information from surrounding infrastructures.

Human uncertainty

The real challenge that autonomous driving faces is human drivers operating vehicles unpredictably. If only self-driving vehicles are allowed on the road, traffic safety can be ensured as all road conditions can be monitored by analyzing data collected from infrastructures, V2V communication as well as sensors and vehicles are controlled by automated systems. However, such scenarios are not possible with the current development of self-driving systems or cars. This imposes great challenges in self-driving vehicles' ability to operate defensively in a disorganized environment with human drivers.

Customized emulator testing quickly overcomes the challenges arising from a mixed use of different communication standards

Sponsored content

In 2010, the China Ministry of Industry and Information Technology (MIIT) officially selected Wuxi National Hi-Tech Industry Development Zone as a national electronic information industry demonstration base, setting off a global IoT trend. Aside from existing WLAN and Bluetooth, additional networking standards designed for IoT applications have been burgeoning over recent years. According to Eric Yu, Assistant Vice President, Signal Integrity Business Unit, Integrated Service Technology (iST), IoT applications are diverse and so are their use scenarios, so they impose wide-ranging requirements on communication technologies. This is also the biggest challenge to be addressed during the development phase of IoT products.

Communication technologies for IoT applications can be categorized based on the distance over which signals are transmitted into near-field, short-range and long-range. Communication is essential to IoT system operation and stability is a crucial consideration in product design. Although there are no mandated IoT testing standards regarding to performance at present, experienced laboratory test procedures can help manufacturers ensure their product quality. Furthermore, professional labs with extensive experiences can also help discover blind spots that may have been overlooked during the design phase and solve problems that occur when a product is put to use under special circumstances, said Yu.

Current lab tests include basic tests, performance tests, special function tests and certification tests. Basic tests check safety, regularity, energy consumption and reliability. Performance tests measure connectivity, desense and transmission capacity. Special function tests validate system integration and information security. Certification tests verify compliance with special requirements set by government institutions or industry alliances.

Among the four types of tests, certification tests involve the right to use the logo mark and intellectual property right while basic tests on safety, regularity and energy consumption are required by national or regional regulations. In comparison to certification tests and basic tests, performance tests and special function tests are not mandatory and are generally self-initiated by manufacturers. However, due to IoT's special characteristics, Yu thinks the performance tests and special function tests will play an influential role to IoT product design.

Yu further said, the market has begun to see such a mixed use of multiple communication technologies. However, certifications of wireless communication standards are still implemented on a one-by-one basis. Only Cellular Telephone Industries Association (CTIA) in U.S. has proposed specifications on device performance when operating concurrently with cell phone signal and Wi-Fi signal. Other countries or regions have yet to engage in such practices.

Furthermore, there is the problem of desense. Wireless communication uses a very concentrated range of frequencies, mostly on 2.4GHz and 5GHz now. Communication technologies operating within the same range of frequencies can use different demodulation techniques so that the receiving end can make accurate detection of the signals but interference is still unavoidable, particularly in the 2.4GHz band, which already has Bluetooth and WiFi. Furthermore USB 3.0 operates on 5GHz data rate could also have strong interference to 2.4GHz signals. There have been reports of such interferences occurring in TV, for example.

As the media industry began to undergo some changes in 2016, people getting use to watch video signals stream over Ethernet rather than over cable networks. The way it works is that signals coming to the home via external Ethernet are then sent to TV using Wi-Fi through an Access Point (AP). As such, Wi-Fi has become the fourth main test item for TV. For a home theater systems with standalone speakers, signal transmission between the TV and speakers is via Bluetooth connection. Accordingly, the TV sends video signals via both Wi-Fi and Bluetooth in the same 2.4GHz range, which makes it susceptible to interference. The situation is bad enough for TV. Just think how much worse it will be when a future home is deployed with a complete IoT system and all devices are operating simultaneously Customized testing is the solution to such a problem, proposed Yu.

To test smart home devices, a common current practice is to set up a mockup home environment such as a living room, bathroom, kitchen or bedroom and then install IoT devices there to check how well the devices operate together and gain an understanding on their communication and operation status in the environment. This only checks one particular indoor setting but not able to cover different types of indoor environment which cannot be considered as a quick and effective initial test. In real-world application, IoT systems have to cope with different home settings and decorations and their functions may also vary based on home owner needs. As such, the test practice using a mockup home environment to check interoperability and performance provides little help to manufacturers.

For now, emulator testing will be a cost-effective approach, said Yu. A software-and-hardward-based emulator environment is built wherein throughput capacity, roaming and desense tests are conducted. However, this must be backed by robust technologies. Take iST for example,its chose the emulator bases on correct theory and trustworthy. It is no easy to build a test environment using an emulator. iST's emulator developed with theory and field trial results taken into consideration produces a model of a real environment. First, a far field test environment is defined according to CTIA' test specifications and then correct parameters are input to the emulator to create channel models of the indoor environment.

Eric Yu, Assistant Vice President, Signal Integrity Business unit, Integrated Service Technology (iST). (Photographed by DIGITIMES)

Yu comments that connectivity is the biggest challenge for IoT system operation. On a system level, performance tests sometimes not only can help boost system performance from 80% to 90% but of more critical importance, they can help a system jump from 0% to 80%. After all, only when signals can be transmitted without error and glitch will system deployment be meaningful. Yu also reiterates with IoT developments picking up speed over recent years, different types of applications will begin to emerge. Mixed use of multiple technologies will be the only way to go. Testing is an essential step in guaranteeing system reliability, and customized testing tailored to fit different use scenarios will also be instrumental to product R&D in the future. The use of emulator to create modeled test environments will help manufacturers quickly get to the root of the problem and establish a strong foothold in the IoT market.

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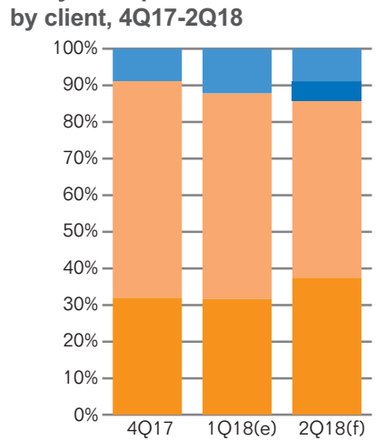
Wiwynn shipment share by client, 4Q17-2Q18



	4Q17	1Q18(e)	2Q18(f)
Others	8.9%	12.2%	8.9%
Amazon	0.0%	0.0%	5.4%
Microsoft	59.1%	56.1%	48.2%
Facebook	32.0%	31.7%	37.5%

Source: Digitimes Research, April 2018

With second-quarter 2018 entering high season, leading makers can expect a sequential increase in shipments. Among them, Wywinn will deliver the highest growth, likely to exceed 35%. Quanta can expect 50% more orders from Intel compared to the prior quarter. Quanta's shipments to China will also enjoy growth thanks to an expanding QCT customer base. Total shipments by Quanta are likely to ramp up 17% on quarter.

Dell and HP slashed their orders with Foxconn in 2017. But Foxconn has stepped up efforts to regain orders from the clients. Its shipments in the first half of 2018 will likely experience continuing growth. However, as its quarterly increase will be smaller than that of other makers, Foxconn's share of shipments will probably drop to 18%.

USI will continue to benefit from Super Micro's orders but capacitor shortages may have a critical impact on its shipment plan.

Client-maker server shipment matrix

During the high season in second-quarter 2018, most of the server manufacturers can expect to ship more units to each customer compared to the prior quarter.

HP's ratio of orders for Inventec will likely edge up 1.5pp to 48%. Shipments by Inventec, Foxconn and Wistron to HP will all show growth of, respectively, 12%, 6% and 7%. In the first quarter of 2018, HP's orders were returning to Foxconn but more of them will go to Inventec in the second quarter, depending on specific product attributes and project requirements. Some of Inventec's shipments are provided to Foxconn in the form of motherboards which are then assembled into complete units and shipped to HP.

Dell will continue to moderately increase its orders for Foxconn and Inventec while reducing its orders for Wistron. Shipments by Inventec and Foxconn to Dell will both show growth of, respectively 8% and 5%, but Wistron's shipments to Dell will likely drop 5% as its orders get snatched by the other two.

The ratio of Google's orders between Inventec and Quanta will slightly change from 55:45 to 54:46. Google's orders for Quanta will likely increase by 70,000 to 80,000 units, up about 7% on quarter while its orders for Inventec will show flat growth.

Facebook's orders for Quanta and Inventec will maintain at similar levels to the prior quarter's. In contrast, Facebook's orders for Wywinn will hike 60% on quarter, with the client's share of Wywinn's shipments to expand 12pp to 57%. Wywinn will see orders from Facebook and Microsoft increase 62% and 17% to 105,000 and 135,000 units respectively.

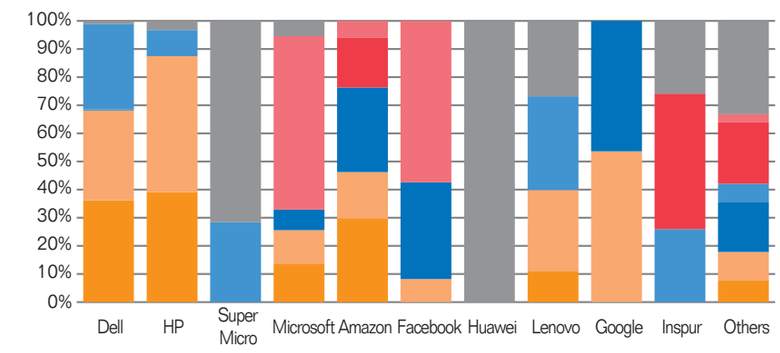
Amazon's orders for Foxconn, Quanta and Mitac will all increase on quarter and Amazon will add Wywinn as its server supplier.

Looking forward into second-quarter 2018, Inventec's reliance on HP will increase 1.3pp to 32.2% as its shipments to HP will exhibit a 12% sequential growth, outperforming Inventec's overall shipment growth of 7%.

Wistron's shipments to Super Micro will likely expand 9% on quarter, better than Wistron's overall growth of 3%. As such, its reliance on Super Micro will go up 1.2pp to 25%. Wistron's shipments to Inspur will soar a whopping 180% but the quantity will still be small. Therefore, the share of Inspur among Wistron's total shipments will only grow to 8.6%.

Wywinn's shipments to Facebook will hike 60% on quarter and its reliance on Facebook will rise 5.8pp to 37.5%. Wywinn will also add a new customer – Amazon.

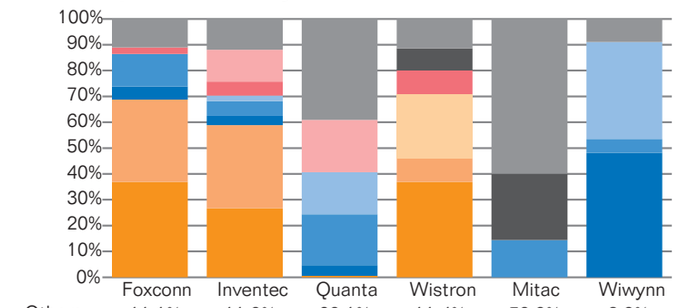
Client shipment share by maker, 2Q18



	Dell	HP	Super Micro	Microsoft	Amazon	Facebook	Huawei	Lenovo	Google	Inspur	Others
Others	1.1%	3.3%	71.6%	5.5%			100.0%	26.8%		25.9%	33.2%
Wiwynn				61.6%	5.9%	57.4%					2.9%
Mitac					17.8%					48.2%	21.8%
Wistron	30.4%	9.3%	28.4%					33.3%		25.9%	6.6%
Quanta	0.3%			7.3%	30.0%	34.4%			46.4%		17.6%
Inventec	32.0%	48.4%		11.9%	16.6%	8.2%		29.0%	53.6%		10.1%
Foxconn	36.1%	39.1%		13.7%	29.6%			10.9%			7.7%

Source: Digitimes Research, April 2018

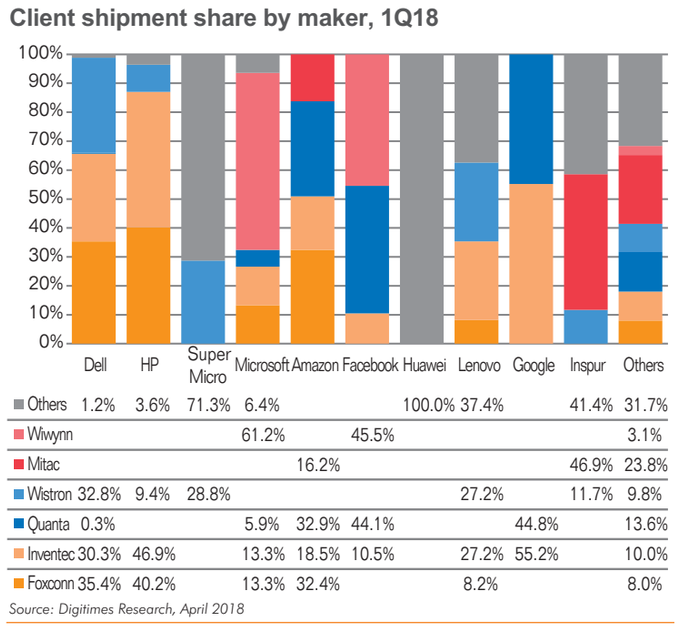
Maker shipment share by client, 2Q18



	Foxconn	Inventec	Quanta	Wistron	Mitac	Wiwynn
Others	11.1%	11.9%	39.1%	11.4%	59.9%	8.9%
Inspur				8.6%	25.6%	
Google		12.3%	20.2%			
Lenovo	2.5%	5.5%		9.2%		
Huawei						
Facebook		2.1%	16.3%			37.5%
Amazon	12.6%	5.8%	19.7%		14.4%	5.4%
Microsoft	5.0%	3.6%	4.1%			48.2%
Super Micro				25.0%		
HP	31.9%	32.2%		9.0%		
Dell	36.9%	26.7%	0.5%	36.9%		

Source: Digitimes Research, April 2018

Client shipment share by maker, 1Q18



	Dell	HP	Super Micro	Microsoft	Amazon	Facebook	Huawei	Lenovo	Google	Inspur	Others
Others	1.2%	3.6%	71.3%	6.4%			100.0%	37.4%		41.4%	31.7%
Wiwynn				61.2%		45.5%					3.1%
Mitac					16.2%					46.9%	23.8%
Wistron	32.8%	9.4%	28.8%					27.2%		11.7%	9.8%
Quanta	0.3%			5.9%	32.9%	44.1%			44.8%		13.6%
Inventec	30.3%	46.9%		13.3%	18.5%	10.5%		27.2%	55.2%		10.0%
Foxconn	35.4%	40.2%		13.3%	32.4%			8.2%			8.0%

Source: Digitimes Research, April 2018

With respect to order distribution in first-quarter 2018, a prominent change was HP's orders returning to Foxconn. The share of Foxconn among shipments to HP expanded from 33% in the prior quarter to 40% in the first quarter.

Dell distributed its orders evenly among Foxconn, Wistron and Inventec. Wistron provided 36% of Dell's servers in the fourth quarter of 2017 but the ratio lowered to 33% in fourth-quarter 2018 while Foxconn and Inventec both saw more orders from Dell.

Microsoft used to give major portions of server orders to both Wywinn and Foxconn, but now Wywinn gets the largest share.

The share of Amazon's orders with Quanta and Inventec increased 3pp and 7pp respectively compared to the previous quarter. In terms of quantity, Amazon's orders for Quanta and Inventec respectively increased 8% and 60% on quarter.

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In the past, Gigabyte's promotion activities focused mainly on traditional channels, but since 2017, we have started to use more diverse types of marketing in different channels. With Gigabyte having integrated all its gaming-related businesses under the Aorus brand and the fact that we have shown our determination of running the Aorus brand, we have earned many invitations from worldwide businesses and gamers for gaming-related cooperation.

Q: What innovations or technologies will be unveiled or showcased at Computex 2018?

A: We do not have any new products for Computex 2018 as our upstream platform partners have not prepared any new products for the show.

However, we are showcasing our extended peripheral product lines under the Aorus brand including SSDs and memory and are displaying the full series of our existing Aorus brand products at our Computex booth.

Q: What is Gigabyte's thought on cryptocurrencies? Will ASICs have some impact on graphics card demand from the cryptocurrency industry?

A: Cryptocurrencies are one of the applications of the blockchain technology and the technology is becoming a popular topic in the IT industry. To fairly distribute the cryptocurrencies to users, mining has become one of the main methods for the system to give out the digital currencies.

However, mining is not the only way as there are also cryptocurrencies that have adopted other type of distributing methods.

In my personal view, blockchain actually has a lot potential and because of the technology's characteristic of creating records in multiple terminals. It is able to significantly limit a trading system's dependence on a center machine and eliminate many of the recording flaws seen on traditional systems. Compared to blockchain business in general, opportunities from cryptocurrencies are not as stable.

As for the rise in demand for cryptocurrency ASICs, I believe the growing popularity of ASICs will have some impacts on the cryptocurrency industry's demand for graphics cards, but the problem will not be as serious as many market watchers expect.

As I said before, cryptocurrencies are a rather unstable business. Each ASIC is created specifically for the calculation of one particular type of cryptocurrency and cannot be switched to support other cryptocurrency mining. This will give advantages to graphics cards, which can widely support any kind of cryptocurrency mining process. Most miners will be wary of the risks of switching all its machines to ASICs.