ENABLING EXTRAORDINARY EXPERIENCES
XPERI

DIGITIMES

Tel:+886 2 8712-8866 Fax:+886 2 8712-3366 Advertising:editor@digitimes.com

Wednesday May 31, 2017 www.digitimes.com

Intel makes it rain for PC enthusiasts

Micahael McManus, DIGITIMES

Intel came out of gate firing at this year's Computes Taipei, announcing a slew of processors for its new X-series of desktop CPUs at the company's keynote during the first day of the show.

Gregory Bryant, corporate vice president and general manager of the Client Computing Group at Intel introduced the new X-series, which he called performance with scale. The new series launches the new Intel Core i9 processor brand and spans from 4 to 18 cores with price points to match.

On the marketing side, the new family represents the highest performance for extreme performance and extreme mega-tasking, targeting content creators, gamers and overclockers, according to Intel. On the geeky side of things, the new Intel Core i9 Extreme Edition processor will feature the first consumer desktop CPU with up to 18 cores and 36 threads. The family also includes Intel's first teraflop desktop CPUs, showing how much raw compute can be achieved with the new processors.

While some market watchers are saying that Intel is responding to the recent resurgence of AMD, which launched its Ryzen family of processors earlier this year and who will top off with a Threadripper

▲ Computes Taipei 2017: The SSD wall is a must-have for any storage room

CPU offering of 16 cores and 32 threads, Intel simply stated that the company has been rewarded for the innovation it has implemented in the enthusiast market over the past year and the company intends to continue investing in the area. Sales of its K-series of unlocked processors are expected to increase 20% annually and according to market research firm John Peddie, the high-end gaming market is expected to grow 12% this year. Intel CEO Brian Krzanich stated during the company's most recent investor conference that demand for high-end, high-performance products, including gaming solutions, continues to grow faster than Intel is able to project.

However, Intel also stressed that it is offering more than just extra cores. Bryant explained that the company's goal is to have its technologies work together to deliver extreme performance across the entire platform. Along with the family of processors, Intel introduced a new Intel x299 chipset, which adds more I/O and overclocking capabilities. Intel also announced updates to its Intel Turbo Boost Max Technology 3.0.

On the chipset side, the x299 will support the new Socket R4 (LGA 2066) and be compatible with all new Intel Core X-series processors (4C–18C). The chipset features support for Intel Optane memory and has improved I/O capabilities. The 30 total high-speed I/O lanes supported by the chipset can offer up a variety of flexible configurations, including support for up to 24 PCIe 3.0 lanes, and up to eight SATA 3.0 ports and up to 10 USB 3.0 ports.

For those not familiar with Intel's Optane memory, it is a system acceleration solution that places the memory media between the processor and slower SATA-based storage devices (HDD, SSHD or SATA SSD) in order to boost performance. This allows the system to access the information more quickly and improve overall system responsiveness. In other words, Intel Optane memories combines memory and storage into one virtual drive visible to the OS and with an optimized system interconnect that uses Intel RST software to accelerate performance and responsiveness of the PC, according to Intel.

Intel has also updated its Turbo Boost Max Technology. With the Intel Broadwell-E architecture, Turbo Boost was used for software that did not access all of the CPU cores at once. Intel tuned the CPU to adjust to such a situation by having the best performing core at a given time be accessed, allowing additional headroom to turbo boost or deliver the highest frequency available. With the launch of Skylake processors and now with the X-series, Turbo Boost 3.0 has been implemented whereby processing can be accessed across two cores instead of one, further boosting performance.

The new X-Series has been built for enthusiasts, and for what Intel calls a new kind of power user for PCs when it comes to content creation. The PC giant noted that it is not trying to redefine the market for professionals requiring Xeon workstations (though there is some overlap) but there is a growing segment of prosumers, whether in a startup or working from home, that need incredible horsepower to get the job done as quickly as possible. Intel introduced the word mega-tasking for users who access huge files such as video or multi-media and need to manipulate these files across a multiple number of software applications almost simultaneously and rendering them to high-resolution 4K displays.

These mega-taskers can include gamers, who require the highest end features to optimize their gaming experience, but at the same time may be live-streaming their performance on Twitch while also recording the whole thing in HD 4K resolution so it can be edited and uploaded to YouTube at a later time. Intel noted that this type of activity is redefining what it means to be a content creator.

Continued on page 2...

Intel touches on a number of themes during keynote, highlighting that one size doesn't fit all in today's IT industry

Michael McManus, DIGITIMES

On the first day of Computex Taipei 2017, Intel corporate vice president and general manager of the Client Computing Group Gregory Bryant delivered the opening keynote for the chip giant at the Computex e21 Forum, touching on how data is transforming the world.

Data has always been everywhere but Moore's Law has allowed technology to slowly catch up, as highlighted by the various themes of Computex Taipei this year - themes including unpatrolled computing performance on the desktop to process data, increased development of artificial intelligence in the data center to organize, process and share data, and new developments in IoT to help collect and connect data.

And while Intel announced its highly anticipated launch of the new X-Series of desktop processors, the company also showed how new uses of data are fueling new levels of user demand in various industries.

▲ Gregory Bryant, corporate vice president and general manager of the Client Computing Group at Intel

On the PC side, Intel noted that innovation is coming from across the ecosystem, from stylishly designed always-connected 2 in 1s, to incredibly powerful high-end desktops, to solutions that focus on delivering virtual reality rather than processing data from the real world.

Intel's mantra that one size doesn't fit all and no one wants to settle seems fitting for Computex this year and the company touched on different areas where it is addressing them.

On the desktop side, there was the launch of its most powerful desktop processors ever, as well as the comment that its next generation processors (8th gen Coffee Lake processors) will boast an increase of performance of more than 30% and arrive by the holiday season at the end of the year.

On the mobile side, there is the always-connected PC that features LTE connectivity integrated into the PC. Intel has been working with Microsoft and there are now more than 30 solutions available, including portables from Acer, Huawei, Lenovo, MSI and Asus.

And it makes sense that Bryant also took time during his keynote to talk about the Intel Compute Card, one of the smallest computing solutions in the market.

The Intel Compute Card offers the capabilities of a full computer but in the size of a credit card. According to Intel, the applications are endless – from smart screens, interactive appliances, smart factories and more. Bryant noted that the solution is a perfect complement to everything else Intel is doing to bring more compute power and connectivity into the home and beyond.

At CES earlier this year, Intel unveiled the Intel Compute Card, a modular platform developed to transform how devices compute and connect. Now at Computex 2017, Intel is showcasing a variety of solutions utilizing the Intel Compute Card that are currently being developed by a wide range of partners, spanning notebooks and tablets to digital signage and POS to AIOs and intelligent whiteboards.

The Intel Compute Card features an Intel SoC, memory, storage and wireless connectivity with flexible I/O options so hardware manufacturers can optimize for their particular solutions, from interactive refrigerators and smart kiosks to security cameras and IoT gateways. Device makers simply design a standard Intel Compute Card slot into their device and then utilize the best Intel Compute Card for their performance and price needs. This reduces the time and resources needed to design and validate the compute block and helps speed up innovation to bring the power of intelligence into an ever wider range of devices.

Partners who have products showing at Computex include Contec, ECS, Foxconn, LG Display, MoBits Electronics, NexDock, Sharp, Seneca, SMART Technologies, Suzhou Lehui Display and TabletKiosk. Other partners currently working on solutions include Dell, HP and Lenovo.

The Intel Compute Card is scheduled to begin shipping in August 2017. The product will initially be available in four SKUs.

...Continued from page 1

For those enthusiasts that demand the ultimate platform for gaming, VR, content creation and overclocking, Intel believes it has delivered with the X-Series. The new family of processors delivers up to 10% faster multi-thread performance than previous generations, up to 15% faster single-thread performance and a massive 36-thread performance and quad-channel memory for content creation and extreme megatasking. The CPUs also support up to 44 lanes of PCIe 3.0 components connected directly to the CPU, in order to create the ultimate PC with the fastest SSDs, multiple discrete graphics cards and Thunderbolt 3 technolgy support.

But like anything else, the ultimate solution comes with the ultimate price. 18-core X-Series CPUs are set to be priced at US$1,999 while 16-core processors will be priced at US$1,699. However, Intel is scaling from top down with an offering of the Kaby Lake Core I5-7640X 4-core CPU for US$242. The Core-I9 series begins with the 7900X 10-core processor priced at US$999.

Gigabyte, MSI, Asustek, Asrock, Acer and Dell are exhibiting Intel products at Computex and have all been listed as partners for the Intel X-Series.

UNLOCKED INTEL® CORE™ X-SERIES PROCESSOR FAMILY

	Processor number[1]	Base clock speed (GHz)	Intel® Turbo Boost Technology 2.0 frequency[2] (GHz)	Intel® Turbo Boost Max Technology 3.0 frequency[3] (GHz)	Cores/ threads	L3 cache	PCI Express[4] 3.0 lanes	Memory support	TDP	Socket (LGA)	RCP pricing (USD 1K)
NEW	Intel® Core™ i9-7980XE	–	–	–	18/36	–	–	–	–	2066	$1,999
NEW	Intel® Core™ i9-7960X	–	–	–	16/32	–	–	–	–	2066	$1,699
NEW	Intel® Core™ i9-7940X	–	–	–	14/28	–	–	–	–	2066	$1,399
NEW	Intel® Core™ i9-7920X	–	–	–	12/24	–	–	–	–	2066	$1,199
NEW	Intel® Core™ i9-7900X	3.3	4.3	4.5	10/20	13.75 MB	44	Four channels DDR4-2666	140W	2066	$999
NEW	Intel® Core™ i7-7820X	3.6	4.3	4.5	8/16	11 MB	28	Four channels DDR4-2666	140W	2066	$599
NEW	Intel® Core™ i7-7800X	3.5	4.0	NA	6/12	8.25 MB	28	Four channels DDR4-2400	140W	2066	$389
NEW	Intel® Core™ i7-7740X	4.3	4.5	NA	4/8	8 MB	16	Two channels DDR4-2666	112W	2066	$339
NEW	Intel® Core™ i5-7640X	4.0	4.2	NA	4/4	6 MB	16	Two channels DDR4-2666	112W	2066	$242

Integrating all-round technologies, Xperi is committed to enabling extraordinary and innovative experiences

Sponsored content

Introduction:

As a brand well recognized by the industry and consumers, Digital Theater System (DTS) has been devoted to the development of sound technologies for over two decades. Now DTS and other brands mastering different technologies, including HD Radio, FotoNation, Invensas and Tessera, have merged under Xperi to deliver innovative total solutions for users.

Tessera Holding Corporation acquired the five leading brands in different areas of expertise – DTS, HD Radio, FotoNation, Invensas and Tessera – at the end of 2016 and became a provider of total solution products and licensed technologies combining top-notch audio technology, computer imaging, computer vision, mobile computation and communication, memory, data storage and 3D semiconductor interconnecting and packaging. Tessera Holding Corporation officially changed its name to Xperi Corporation on February 23 this year to take on a whole new brand identity and mark the company's commitment to business expansion and technology innovations.

Aaron Chen, XPERI General Manager, Business Development Taiwan, APAC, indicated DTS exhibited four main themes – Headphone:X, Play-Fi, DTS:X and HD Radio – at COMPUTEX 2016, highlighting that applications of audio technologies could extend from televisions, home theaters, mobile devices, streaming services all the way to car infotainment systems to provide consumers with immersive premium sound experiences. This year, with the new brand Xperi, a wider range of products will be on display expanding from the original sound technologies to imaging technologies including FotoNation's R&D achievements in biometrics and depth-of-field (DoF) sensing.

Full-scale expansion into Asia with the five-brand business

Aaron Chen pointed out in the five brands under Xperi, DTS specializes in audio processing, FotoNation is an expert in digital imaging, HD Radio focuses on in-car digital audio broadcasting, while Invensas and Tessera have accumulated strong R&D capabilities in semiconductor packaging and related IP licensing. Looking forward, Xperi will leverage each brand's expertise to keep introducing new creative offerings for content, devices and application scenarios in consumers' everyday life and thereby improve the quality and quantity of its licensing services.

More importantly, all Xperi products, whether for home, mobile, automobile or semiconductor applications, will be available in Asia in full scale. For example, Invensas, offering licensing services in semiconductor packaging technologies, is setting up its first branch office in the Asian Pacific region to strengthen local business promotion.

In terms of products and licensed technologies for home uses, key technologies include DTS:X and Play-Fi. The new generation surround sound technology DTS:X aims to boost users' audio experiences from the originally flat 5.1 and 7.1 channel to the 11.1 or 11.2.1 stereo sound, marking a new milestone for home theaters. Therefore, most AVR brands consumers can see on the market have included support for the technology.

For mobile applications, Xperi will focus on DTS:X and DTS Headphone:X. For automobile applications, Xperi will feature HD Radio and Driver Monitoring System (DMS). For semiconductor, Xperi will highlight the licensing of DRAM patents, and for image sensing and MEMS/RF applications, Xperi will offer licensing services of ZiBond or DBI patents.

Developing innovative solutions for five major IoT applications

Aaron Chen commented Xperi's innovative products and solutions can be categorized into five main areas of use: mobile, IoT, AR/VR, consumer electronics and automobiles. All of the five subsidiary brands DTS, HD Radio, FotoNation, Invensas and Tessera will introduce their R&D achievements respectively for the five areas of use. For example, in terms of IoT applications, a well-known smart speaker product in the U.S. will integrate DTS Play-Fi so the user can give voice commands to control the speaker to play the songs he or she likes.

Furthermore, the Xperi headquarters has named IoT, biotechnology, IoV, robotics and AI as the critical technologies that will dictate how people live in the future. Therefore, Xperi's product R&D efforts will closely follow the development trends of these technologies to create endless possibilities that can have consequential influences on people's lives.

Xperi's priority for this year and the next will center around FotoNation's digital imaging technology. Keeping abreast with smartphone developments, FotoNation's digital imaging technology provides not only face recognition and iris identification solutions but also DoF sensing. Xperi is fully committed to building identity verification mechanisms with a higher level of security and working with partners to accelerate the development of innovative financial services such as mobile payment. In addition, it is highly possible that Xperi will use FotoNation's face recognition technology in DMS which can continuously monitor changes in the driver's facial expression and eye focus to thereby determine how tired the driver may be. Then, DMS can take timely actions to ensure safety on the road.

▶ Aaron Chen, XPERI General Manager, Business Development Taiwan, APAC, indicates the company will strengthen its solutions for biometrics (including face recognition and iris identification) and DoF sensing to match the trend of dual-camera smartphones.

Technological advantages to help Gigabyte remain competitive in declining motherboard market:

Q&A with Gigabyte Technical Marketing Manager, Leon Chen

Joseph Tsai, Taipei

Gigabyte Technology has been performing well in the motherboard market for the past few years and is currently a top-2 player in the industry. However, the market has not been treating motherboard players well with year after year shipment declines. However, that does not discourage Gigabyte from trying to advance and grow.

Digitimes recently had a chance to talk with Gigabyte's Technical Market Manager Leon Chen to get an idea about Gigabyte's latest business strategy on how to maintain its competitiveness despite a falling market.

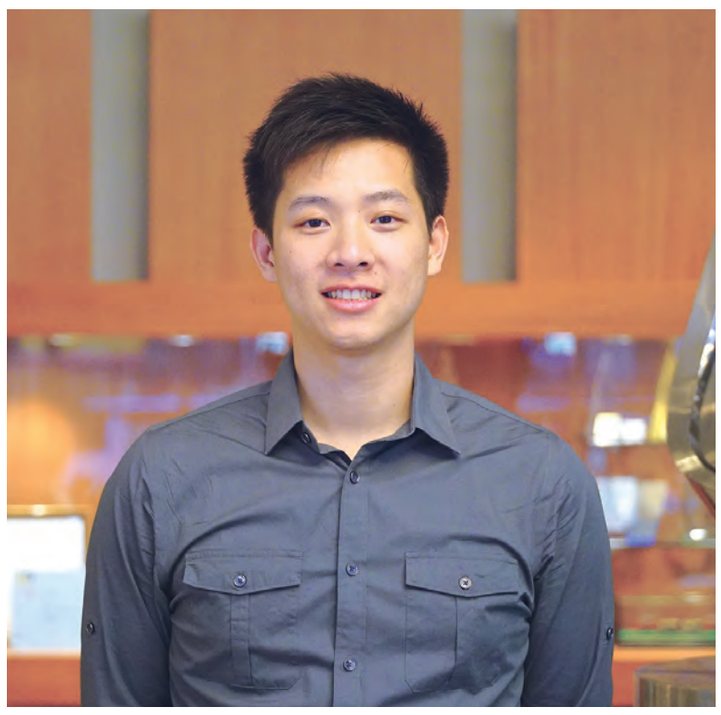
Q: What are some of the key issues the PC industry is facing that will determine success for motherboard makers like Gigabyte in 2017?

A: We can clearly see that the motherboard market is indeed shrinking every year and it is an undeniable fact that all motherboard players need to face.

To achieve success in a declining market, having products that are integrated with in-house developed technologies and exclusive feature sets is important. Gigabyte's R&D staff has always been seeking niche applications that can be applied onto our motherboards and one of the latest innovations we have implemented is the digital LED light feature.

We have spent a lot of times tuning the new LED light feature and consumers are able to make adjustments to each individual LED via Gigabyte's RGB Fusion app software.

We are also promoting the software via a microsite to show component vendors that have partnerships with us, firms such as Kingston and Corsair, that the LED light features can also be applied to the related components on the motherboard when those components are equipped with LED light modules. So when they are connected with a Gigabyte motherboard, they are also able to light up just as much as the motherboard does, all thanks to the LED light setting.



▲ Leon Chen, Gigabyte Technical Marketing Manager

As for our mid-range to entry-level product lines, although Gigabyte will not immediately adopt its latest technologies or innovations on them due to high costs, the company will still push to implement the ideas onto these products once their costs are lower so all customers can enjoy the innovations Gigabyte provides.

Q: Are there any other products that Gigabyte is planning to promote at Computex 2017?

A: At Computex 2017, Gigabyte is showcasing several new motherboards using Intel's X299 chipsets to correspond with Intel's announcement of its new enthusiast platform. The chipsets can be paired with Intel's new X-series-based processors.

We also prepared some Internet of Things (IoT) solutions to be displayed. These solutions will mainly be targeting the commercial and SMB markets and used in devices such as kiosk, point of sale (POS) or digital signage.

Our flagship Aorus Z270X-Gaming 9 motherboard has also received Best Choice Gold award from Computex 2017, which is something we are very proud of and the product will also be a spotlight at our booth.

For our mini PC product line, Gigabyte has developed the Brix Gaming VR mini PC featuring a Nvidia GeForce GTX 1060 graphics card to support virtual reality (VR) applications. The mini PC has a size of 2.6 liter and is much smaller than the Mac Pro.

Q: Gigabyte is now pushing Aorus to become its gaming brand, how is the strategy affecting Gigabyte's motherboard business?

A: The Aorus brand actually began with our notebook business and we have now moved into pushing Aorus branded motherboards using Intel's high-end 200 series chipsets.

Since the gaming market has already become an important sector for Gigabyte, we do not wish to confuse our customers with our multiple series of product lines like Ultra Durable, Overclocking and Gaming, and Aorus is now serving as our premium gaming brand. When our customers are looking for gaming products, it is Aorus.

Aorus branded motherboards are also keeping all of Gigabyte's exclusively developed technologies and features such as Ultra Durable, meaning the customers will still see their favorite designs including solid capacitors and 2oz copper PCB.

For the mainstream sector, Gigabyte will continue to release motherboards under its Ultra Durable series and the company is also planning to release an X299-based motherboard under the product line.

Our targeted customers for the Ultra Durable series are those who just entered into the PC DIY market and are looking to find good and stable motherboards for their PCs or consumers from small-to-medium-size businesses looking for a reliable motherboard solution.

Q: With China no longer having the strong sales growth it had in the past few years, what regions or product sectors is Gigabyte looking to in order to expand its motherboard business?

A: Currently, embedded and Internet of Things (IoT) applications are directions that Gigabyte has been developing. The two sectors actually have a broad coverage of product devices. For example, we have inquiries from medical care-related players that need high-performance computing device and have adopted Gigabyte's X99-based solutions to satisfy their performance demand.

With the trend, IoT has already become a market that every player is looking to head into.

Q: What products has Gigabyte been developing for the embedded or IoT sector?

A: The embedded and IoT sectors are really large and their product coverage is also really wide. Most of Gigabyte's motherboards can be directly used for most of IoT and embedded scenarios like Kiosk or POS.

We also have a Brix mini PC that is capable of supporting up to four Ultra HD viewing outputs and can act as a digital signage mainframe.

Gigabyte has already been operating in the embedded industry for over three years and we have seen demand for IoT-related applications pick up rapidly in the past couple of years and we believe this is partly because of Intel's aggressive promotion in the sector.

Another advantage that Gigabyte has in the embedded sector is the company's strong service support. Gigabyte has service centers all around the world and can help its customers customize their devices as well as provide after-sales maintenance.

DIGITIMES Research: Taiwan Mobile Device Tracker – 1Q 2017

Taiwan notebooks

Introduction

Growing adoption of Windows 10 in the enterprise sector fueled notebook shipment growth on an annual basis in the first quarter of 2017.

Taiwan makers' notebook shipments reached 29.28 million units in the first quarter of 2017, down 12.6% sequentially but up 13.5% on year.

Taiwan makers' notebook shipments will reach 31.22 million units in the second quarter of 2017, up 6.6% sequentially and 10.8% on year.

NOTE: *Unless otherwise indicated, all figures and tables in this report refer to output from Taiwan makers.*

Taiwan's notebook shipments in the first quarter of 2017 were higher than Digitimes Research's previous estimation, growing 13.5% on year to reach 29.28 million units.

The growth was due to enterprises having accelerated their paces on Windows 10-based notebooks' adoption plus the fact that vendors have been releasing gaming notebooks with friendlier pricing, which has lowered gaming notebooks' ASP and helped the gaming notebook sector achieve better-than-expected shipment growth.

The shipment volume is expected to grow 6.6% sequentially in the second quarter to more than 31 million units. The replacement trend for Windows 10-based notebooks from the enterprise sector will continue.

The second-quarter 2017 growth will be partly contributed by increases in Chromebook shipments, driven by seasonality. Compared to the first quarter, vendors will also have less pressure in the second quarter from price hikes for panels and memory resulting from shortages.

Compared to the same quarter a year ago, Taiwan's shipments will grow over 10% in the second quarter, showing the market recovery is on track.

Taiwan's share in worldwide shipments will grow 0.5pp sequentially in the second quarter because Lenovo is pushing both the enterprise and gaming notebook sectors in the second quarter and the China-based vendor's products for the two sectors are mostly outsourced to its Taiwan manufacturing partners.

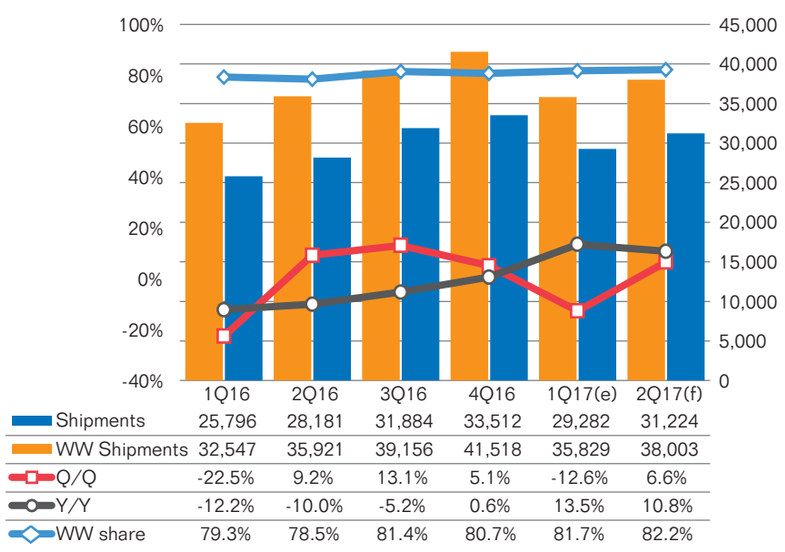
Worldwide notebook shipments also achieved an over 10% on-year growth in the first quarter, but the percentage was smaller than that of Taiwan's volume because of Lenovo's weak performance.

Worldwide shipments are expected to grow 6.1% sequentially in the second quarter, but the growth will be smaller than the 10.4% seen in second-quarter 2016. It will also be weaker than Taiwan's 6.6% growth because Lenovo, despite its shipment growth, will outsource large portions of its products to Taiwan makers.

China's white-box makers will also enjoy rising notebook shipments in the second quarter, but the volume will only account for a small percentage of worldwide shipments and their influence is expected to grow larger in the second half.

Worldwide shipments will grow only 5.8% on year in the second quarter, far weaker than Taiwan's over 10% increase, as Lenovo will have a much lower in-house production rate in the second-quarter 2017 than a year ago.

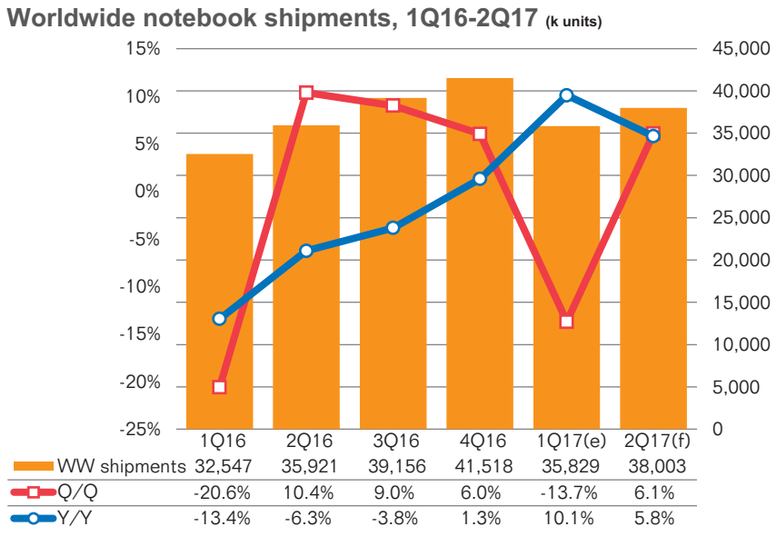
Notebook shipments, 1Q16-2Q17 (k units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Shipments	25,796	28,181	31,884	33,512	29,282	31,224
WW Shipments	32,547	35,921	39,156	41,518	35,829	38,003
Q/Q	-22.5%	9.2%	13.1%	5.1%	-12.6%	6.6%
Y/Y	-12.2%	-10.0%	-5.2%	0.6%	13.5%	10.8%
WW share	79.3%	78.5%	81.4%	80.7%	81.7%	82.2%

Source: Digitimes Research, May 2017

Worldwide notebook shipments, 1Q16-2Q17 (k units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
WW shipments	32,547	35,921	39,156	41,518	35,829	38,003
Q/Q	-20.6%	10.4%	9.0%	6.0%	-13.7%	6.1%
Y/Y	-13.4%	-6.3%	-3.8%	1.3%	10.1%	5.8%

Source: Digitimes Research, May 2017

Shipments breakdown

Clients

Acer became the fourth-largest client of Taiwan makers in the first quarter thanks to its strong orders for Chromebooks.

Apple will be the third-largest client in the first half of 2017 since demand for its new MacBook Pro has been picking up.

In the second quarter, Lenovo will surpass Acer and return as the fourth-largest client, thanks to its orders for enterprise and gaming models. Microsoft, thanks to its Surface Laptop, will replace VAIO to become the 10th-largest in the second quarter.

Huawei and Microsoft are expected to edge Fujitsu-Siemens and VAIO out of the top-10 rankings in the second quarter.

Worldwide largest notebook vendor Hewlett-Packard (HP) continued to widen its gap with second-place Lenovo in the first quarter, but both vendors suffered over 15% sequential shipment declines in the quarter. Dell's shipments only dropped 7.8% sequentially in the first quarter thanks to the support from its shipments to the enterprise sector.

HP began pushing inexpensive gaming notebooks under its Omen brand in the fourth quarter of 2016 and saw growth in Omen shipments in the first quarter of 2017.

Among major vendors, HP has benefited the most from the enterprise sector's replacement trend for Windows 10-based notebooks and its shipment growth and profits from the enterprise sector have allowed the company to adopt an aggressive price-cutting strategy to compete in the consumer segment.

Lenovo suffered from increased component costs and high channel inventory during the first quarter and only its Chromebooks saw good sales performance.

Acer will become a top-5 vendor in the second quarter, surpassing Asustek only by a little margin thanks to its new Chromebook with stylus and gaming models.

Asustek will turn its focus to maintaining its profitability in the second quarter and will see its shipments remain flat from a quarter ago.

HP's shipments will reach above nine million units in the second quarter with enterprise notebooks and Chromebooks being the growth contributors. However, its gap with Lenovo will narrow.

Lenovo is expected to be more aggressive at the start of its new fiscal year in the second quarter. Since the pressure from rising component costs and inventory will be reduced plus the company is also eying the business opportunity from the Chromebook market, the China-based vendor's shipments are expected to grow 11.9% sequentially in the quarter.

Dell will see over 10% sequential growth in second-quarter shipments due to rising shipments to North America's enterprise sector and the releases of its new Chromebooks.

Huawei's new 13- and 15-inch notebooks will begin small-volume of shipments in the second quarter.

Samsung Electronics' shipments will drop over 20% due to its weak performance in China.

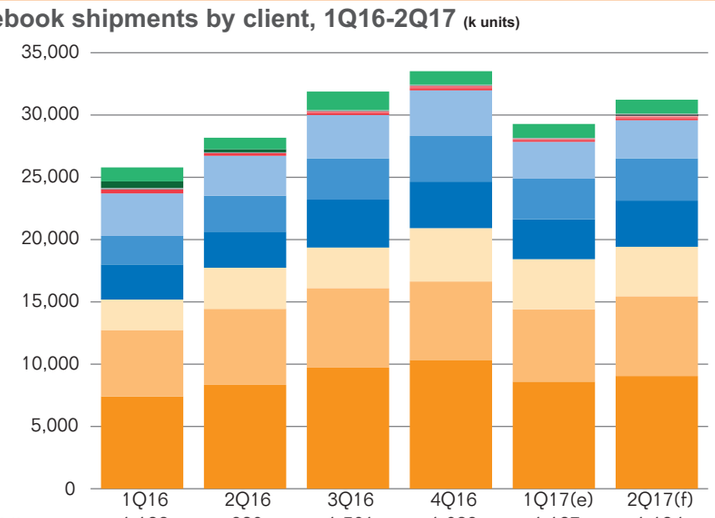
Microsoft's Surface Laptop notebook will start shipping in May, but the volume will still be limited in the second quarter. However, the product is expected to see growing demand in the second half.

China-based white-box players' notebook shipments are expected to surpass 500,000 units in the second quarter. Most of their new devices are inexpensive ultra-thin models with rotatable displays.

At Hong Kong Electronics Fair Spring Edition, white-box players showcased 11.6-, 13.3- and 14-inch ultra-thin notebooks, which are expected to become new mainstream products for the second quarter, replacing 10.6-inch 2-in-1 devices.

Because of increasing component costs and the fact that these white-box players' suppliers of components, including panels and chassis, are improving their manufacturing skills and technologies, white-box players have decided to switch their focuses to notebook products with higher specifications and end-product prices to improve their profitability.

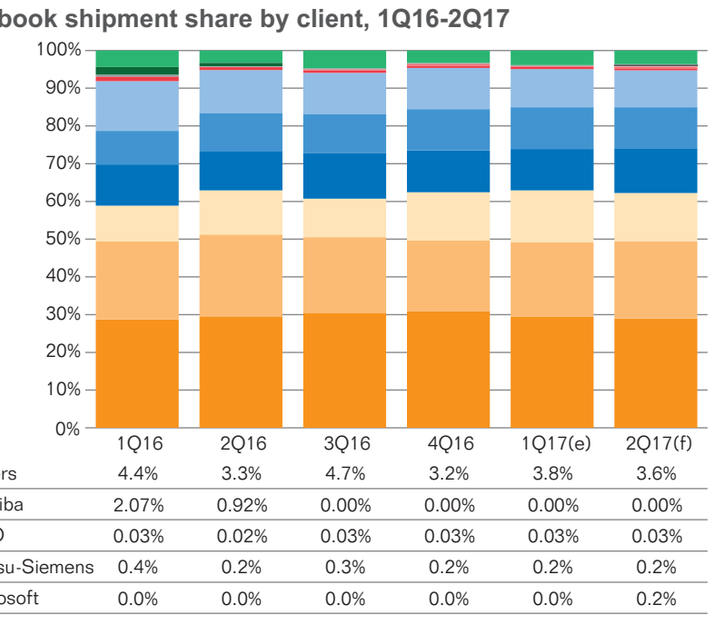
Notebook shipments by client, 1Q16-2Q17 (k units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Others	1,128	920	1,501	1,089	1,127	1,124
Toshiba	534	260	0	0	0	0
VAIO	9	7	10	11	10	8
Fujitsu-Siemens	110	63	80	81	61	65
Microsoft	0	0	0	0	0	75
Huawei	0	0	0	0	0	100
Xiaomi	0	0	113	178	87	110
NEC	310	211	185	186	152	159
Asustek	3,405	3,205	3,470	3,660	2,960	3,058
Acer	2,300	2,883	3,323	3,653	3,245	3,390
Lenovo	2,815	2,895	3,845	3,732	3,217	3,705
Apple	2,450	3,300	3,250	4,285	4,010	3,980
Dell	5,315	6,110	6,380	6,300	5,810	6,400
HP	7,420	8,327	9,727	10,337	8,603	9,050

Source: Digitimes Research, May 2017

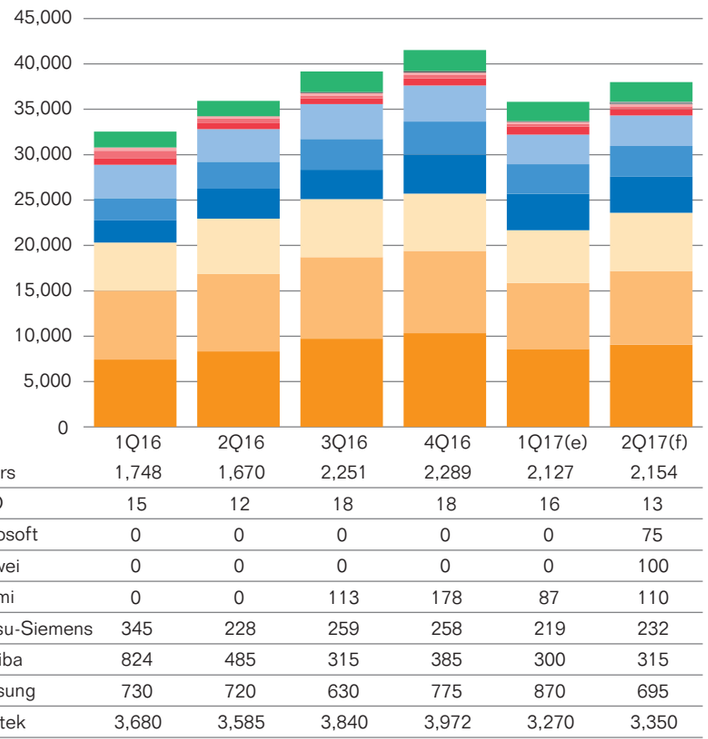
Notebook shipment share by client, 1Q16-2Q17



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Others	4.4%	3.3%	4.7%	3.2%	3.8%	3.6%
Toshiba	2.07%	0.92%	0.00%	0.00%	0.00%	0.00%
VAIO	0.03%	0.02%	0.03%	0.03%	0.03%	0.03%
Fujitsu-Siemens	0.4%	0.2%	0.3%	0.2%	0.2%	0.2%
Microsoft	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Huawei	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Xiaomi	0.0%	0.0%	0.4%	0.5%	0.3%	0.4%
NEC	1.2%	0.7%	0.6%	0.6%	0.5%	0.5%
Asustek	13.2%	11.4%	10.9%	10.9%	10.1%	9.8%
Acer	8.9%	10.2%	10.4%	10.9%	11.1%	10.9%
Lenovo	10.9%	10.3%	12.1%	11.1%	11.0%	11.9%
Apple	9.5%	11.7%	10.2%	12.8%	13.7%	12.7%
Dell	20.6%	21.7%	20.0%	18.8%	19.8%	20.5%
HP	28.8%	29.5%	30.5%	30.8%	29.4%	29.0%

Source: Digitimes Research, May 2017

Global major vendors' shipments, 1Q16-2Q17 (k units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Others	1,748	1,670	2,251	2,289	2,127	2,154
VAIO	15	12	18	18	16	13
Microsoft	0	0	0	0	0	75
Huawei	0	0	0	0	0	100
Xiaomi	0	0	113	178	87	110
Fujitsu-Siemens	345	228	259	258	219	232
Toshiba	824	485	315	385	300	315
Samsung	730	720	630	775	870	695
Asustek	3,680	3,585	3,840	3,972	3,270	3,350
Acer	2,435	2,968	3,383	3,653	3,245	3,390
Apple	2,450	3,300	3,250	4,285	4,010	3,980
Dell	5,315	6,110	6,380	6,300	5,810	6,400
Lenovo	7,585	8,516	8,990	9,068	7,272	8,139
HP	7,420	8,327	9,727	10,337	8,603	9,050

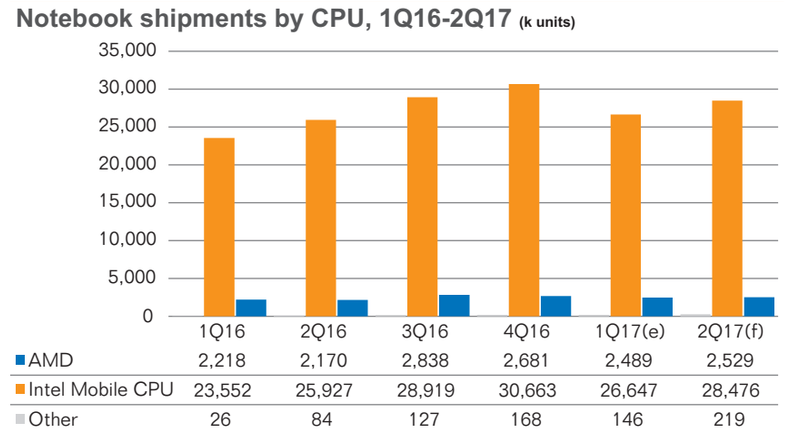
Source: Digitimes Research, May 2017

CPUs

Vendors' new mid-range and high-end Chromebooks for the second quarter are expected to increase shipments of notebooks using Intel's Apollo Lake-based processors as well as ARM-based processors from Rockchip and MediaTek (represented in "Other").

Samsung's Chromebook Plus uses a solution from Rockchip, while Lenovo's Flex Chromebooks uses a solution from MediaTek.

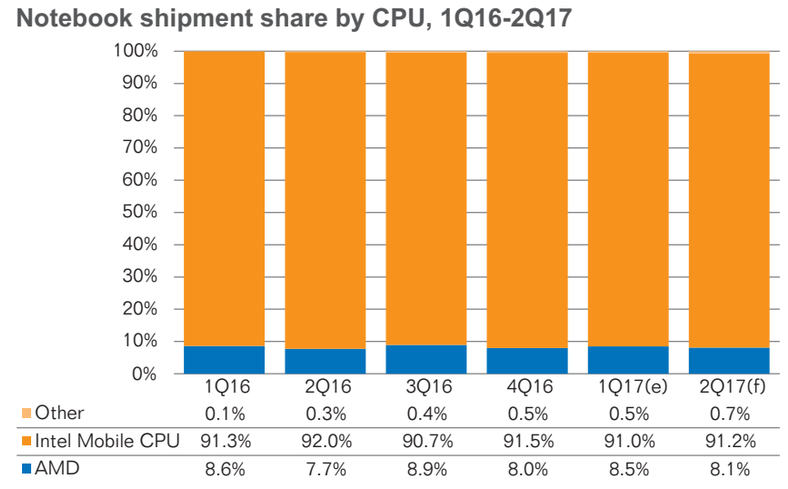
Notebook shipments by CPU, 1Q16-2Q17 (k units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
AMD	2,218	2,170	2,838	2,681	2,489	2,529
Intel Mobile CPU	23,552	25,927	28,919	30,663	26,647	28,476
Other	26	84	127	168	146	219

Source: Digitimes Research, May 2017

Notebook shipment share by CPU, 1Q16-2Q17



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Other	0.1%	0.3%	0.4%	0.5%	0.5%	0.7%
Intel Mobile CPU	91.3%	92.0%	90.7%	91.5%	91.0%	91.2%
AMD	8.6%	7.7%	8.9%	8.0%	8.5%	8.1%

Source: Digitimes Research, May 2017

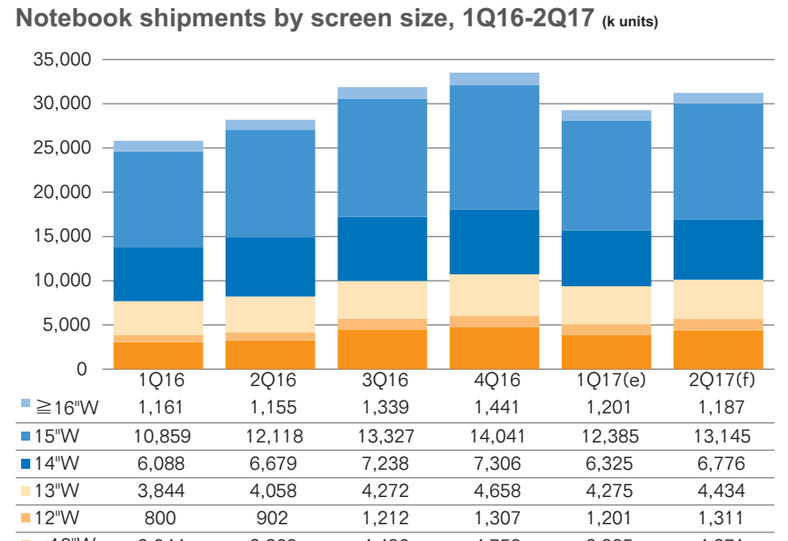
Screen size

Back-to-school demand is expected to boost mostly shipments of notebooks with smaller than 12-inch displays, and it will also result in mild increases in 12- and 14-inch model shipments in the second quarter.

Vendors have mostly adopted 11.6-inch panels for their mainstream Chromebook products, while China-based white-box makers' 11.6-inch clamshell notebook shipments are also expected to see growth in the second quarter.

Microsoft's Windows 10 Cloud operating system, which is designed for the education sector, will also be adopted mainly in 11.6-inch products.

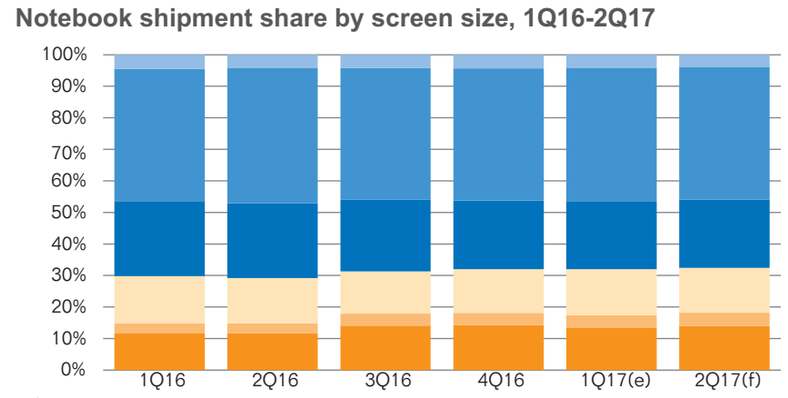
Notebook shipments by screen size, 1Q16-2Q17 (k units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
≧16"W	1,161	1,155	1,339	1,441	1,201	1,187
15"W	10,859	12,118	13,327	14,041	12,385	13,145
14"W	6,088	6,679	7,238	7,306	6,325	6,776
13"W	3,844	4,058	4,272	4,658	4,275	4,434
12"W	800	902	1,212	1,307	1,201	1,311
<12"W	3,044	3,269	4,496	4,759	3,895	4,371

Source: Digitimes Research, May 2017

Notebook shipment share by screen size, 1Q16-2Q17



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
≧16"W	4.5%	4.1%	4.2%	4.3%	4.1%	3.8%
15"W	42.1%	43.0%	41.8%	41.9%	42.3%	42.1%
14"W	23.6%	23.7%	22.7%	21.8%	21.6%	21.7%
13"W	14.9%	14.4%	13.4%	13.9%	14.6%	14.2%
12"W	3.1%	3.2%	3.8%	3.9%	4.1%	4.2%
<12"W	11.8%	11.6%	14.1%	14.2%	13.3%	14.0%

Source: Digitimes Research, May 2017

Continued on page 9...

Gigabyte and Aorus making their marks on Computex 2017

Press release

Gigabyte and Aorus are making their marks on Computex 2017. Their main activities are concentrated on the Taipei World Trade Center Hall 1, booth D0002, where the headlining act is the AERO series with the new AERO 15 being showcased alongside an updated AERO 14.

Under the banner "Mobility, Productivity, Connectivity" the AERO series caters for the demanding professionals, and both models promise features such as a slim frame combined with low weight, up to 10h of battery life, high-end IPS screen panels calibrated to meet the X-Rite Pantone color space, as well as Thunderbolt 3 and USB Type-C connectivity. Both models are powered by 7th generation Intel Core processors and Nvidia GeForce GTX 1050Ti (AERO 14) as well as Nvidia GeForce GTX 1060 (AERO 15).

The AERO 15 incorporates a 15-inch panel into the chassis of a

14-inch laptop, through the use of screen bezels only 5mm thick.

GIGABYTE AERO 15 comes in at 1.9cm thick and 2.1kg with a 94Wh battery, ensuring go-anywhere mobility.

Elsewhere, in the Taipei 101, Gigabyte and Aorus host an invite-only VIP function, where the full 2017 lineup of Gigabyte gaming laptops are being exhibited, with the star of the show being the brand new P56XT, powered by Nvidia GeForce GTX 1070 graphics, offering extreme performance in a 15.6-inch form factor.

"Aside from the AERO series, the biggest news in the Gigabyte lineup for Computex is the P56XT, an ultra-high performance gaming machine with Nvidia GeForce GTX 1070 graphics and our Gigabyte Fusion RGB keyboard in a 15.6-inch form factor. At the Taipei 101 venue, we'll also exhibit our lineup in full, including models such as the Sabre 15 Pro, Sabre 15 and Sabre 17, which are more value-oriented machines, yet still engineered for serious gaming needs, with GPUs such as the Nvidia GeForce GTX 1050, 1050Ti and the 1060," said Vincent Liu, associate vice president of Gigabyte Notebook.

Aorus is also at TWTC with updated versions of the laptops X3, X5, X7 as well as the X9 set to be unveiled, flanked by a variety of gaming peripherals, such as mechanical keyboards and gaming mice.

"The main attraction is the new X5 gaming laptop with its raw power courtesy of Nvidia's GeForce GTX 1070 graphics card, and the highly overclockable Intel Core i7-7820HK CPU. During our rigorous internal testing, we've reached clock speeds of over 5GHz, which speaks volumes of not only the cooling system, but also the internal power design. The X5 still comes with all the gamer-centric features you'd expect, such as the RGB Fusion keyboard, quick and responsive display panels and software such as XSplit Gamecaster and TriDef Smartcam," commented Jonas Klar, Technical Marketing Representative at Aorus.

Other Aorus products debuting during Computex are mechanical keyboards AK700 and AK710. The AK700 is equipped with the gamers' favorite switch – the Cherry MX Red, full individual 16.8M color backlighting and chunky adjustable rubber feet allowing the users to adjust the angle of the keyboard to their specific liking, as well as full N-key rollover capabilities and a built in 256k memory for macro profile storage.

The AK710 uses optical Flaretech switches, lowering response time, prolonging the lifetime of the switch, and making the keyboard splashproof. The AK710 comes with full individual RGB backlighting controlled through the Aorus Engine software.

Cayin to present retail digital signage solutions at Computex 2017

Press release

Digital signage solution developer Cayin Technology brings a food truck to showcase the importance of location-based digital signage in food and beverage industry at this year's Computex.

Cayin is creating a complete business solution experience by transforming its booth into a food truck at K1325. Visitors are encouraged to stop by and see how digital signage can be incorporated into the everyday business, and help elevate customer experience.

The food truck displays will be powered by the durable and compact dual FHD output player, SMP-2100. It is meant for retail and food services, from on-the-go food trucks, to international chain restaurants looking to better engage with customers by integrating e-menus with queuing systems and social media.

The retail solutions can be modified and applied to other vertical market, including education, entertainment, corporate, conventions and more. From single installment to complete remote digital signage network evolving around players and servers, visitors will get a better idea to the scalability and flexibility of Cayin's solutions.

Cayin will also be introducing

▶ CAYIN is creating a complete business solution experience, by transforming its booth into a food truck at K1325.

CMS-SE, a software-only content management server, at the show. CMS-SE is a flexible option for growing projects, and an alternative for making digital signage networks into cloud or IoT services, as it is not confined by the hardware. Visitors will be able to have hands-on experience with the software as a cloud service at Taipei Nangang Exhibition Center, Hall 1.

DIGITIMES

Wednesday May 31, 2017

Gigabyte strengthening its brand recognition in high-end gaming sector by uniting Aorus marketing under one team

Joseph Tsai, Taipei

The gaming market has gradually grown to become a new battlefield among IT vendors thanks to related products' rising demand and high profitability. Many vendors have created a new sub-brand to simplify their gaming product lines and raise the gaming products' recognition in the market. Seeing the trend, Gigabyte also established the Aorus brand a few years ago to represent its top-end gaming devices, but has recently made some change to the brand's operation.

In addition to his position as sales and marketing associate vice president of Gigabyte's Gaming Product Business Unit, Eddie Lin has been recently been assigned as the associate vice president for Aorus' brand marketing team. To understand Gigabyte's motivation for the operation changes for the Aorus brand, Digitimes found a chance to talk to Lin to understand Gigabyte's latest progress on its Aorus gaming business and GPU development.

With competition in the gaming sector growing fiercer every year, Gigabyte has decided to make its Aorus brand become Gigabyte's official gaming sub-brand. The company's high-end gaming products are now all being categorized under the brand, while its entry-level to mid-range gaming merchandises remain under the Gigabyte brand.

Instead of what kinds of products can be considered as Aorus-branded devices, Gigabyte has decided to move all its high-end gaming products under its Aorus brand. For the graphics card business, Gigabyte's old product series for the gaming sector such as Xtreme Gaming and G1 Gaming, are no longer being used for Gigabyte's new products.

Gigabyte's entry-level to mid-range graphics cards will continue to be promoted under the Gigabyte brand, but will only have a simple term such as Gaming, for their names instead of having multiple product lines that may confuse buyers.

Previously, Gigabyte's strategy for Aorus was to have it act as an independent brand, separated from Gigabyte and each department would handle its Aorus-brand products' R&D and marketing independently. However, Gigabyte has found that such a strategy had scattered Aorus' marketing force and Gigabyte's strong brand recognition in the motherboard and graphics card markets did not benefit the performances or market recognition of its smaller product lines much.

To improve the situation, in addition to making Aorus Gigabyte's sub-brand, the company also established a new team to focus mainly on Aorus' product marketing.

For Computex 2017, Gigabyte is preparing a full series of Aorus gaming products including motherboards, graphics cards, notebooks, mice, keyboards, earphones, chassis and cooling modules. In addition to hardware products, Gigabyte also has prepared t-shirts, caps and a gaming chair, hoping to satisfy demand from some fans of the Aorus brand.

Gigabyte has also prepared an Aorus branded external graphics card box and expects the device to help fulfill the needs of consumers that do not wish to carry a heavy gaming notebook around. The graphics card box is able to transmit signal via the latest Thunderbolt 3 technology to improve the graphics output performance of an ultra-thin notebook with an integrated GPU.

▲ Eddie Lin, Gigabyte's Sales and Marketing Associate Vice President of Gaming Product Business Unit

The graphics card box features Nvidia's GeForce GTX 1070 graphics card and comes with a specifically designed carry bag in case you needing to take it on the road. The device will be showcased at Computex 2017 and be released later in 2017.

Gigabyte has also developed a new mouse with a special LED design and a new frameless keyboard that will be showcased at Computex 2017 as well as new chassis.

Gigabyte has also developed many unique technologies for its Aorus graphics cards such as support for up to three HDMI ports, three DisplayPorts and one DVI. One of the HDMI ports is placed at the other end of the card in order to be extended to the front side of a chassis with a Gigabyte-designed panel for VR applications.

The card's cooling fan module also features Gigabyte's proprietary designs. The module has three fans and each fan has a small part of its blade overlap with the fan next to it with the middle fan slightly below the other two to avoid impact between each of the fan's blades. The two side fans also rotate differently than the middle. The mechanism allows the module to produce more air flow from the overlapping section and minimize the chance that the three fans' air flow could interrupt each other.

Because of the new design, instead of the traditional three 80mm fans, Gigabyte is using three 100mm fans for the module to greatly improve the heat dissipation efficiency. The card's back side is also supported by a metal plate to increase the cooling's effectiveness

At Computex 2016, Gigabyte's race car virtual reality (VR) simulation machine had strong popularity and for the 2017 show, the company is planning to place another VR simulation machine to let visitors test Gigabyte's latest technologies.

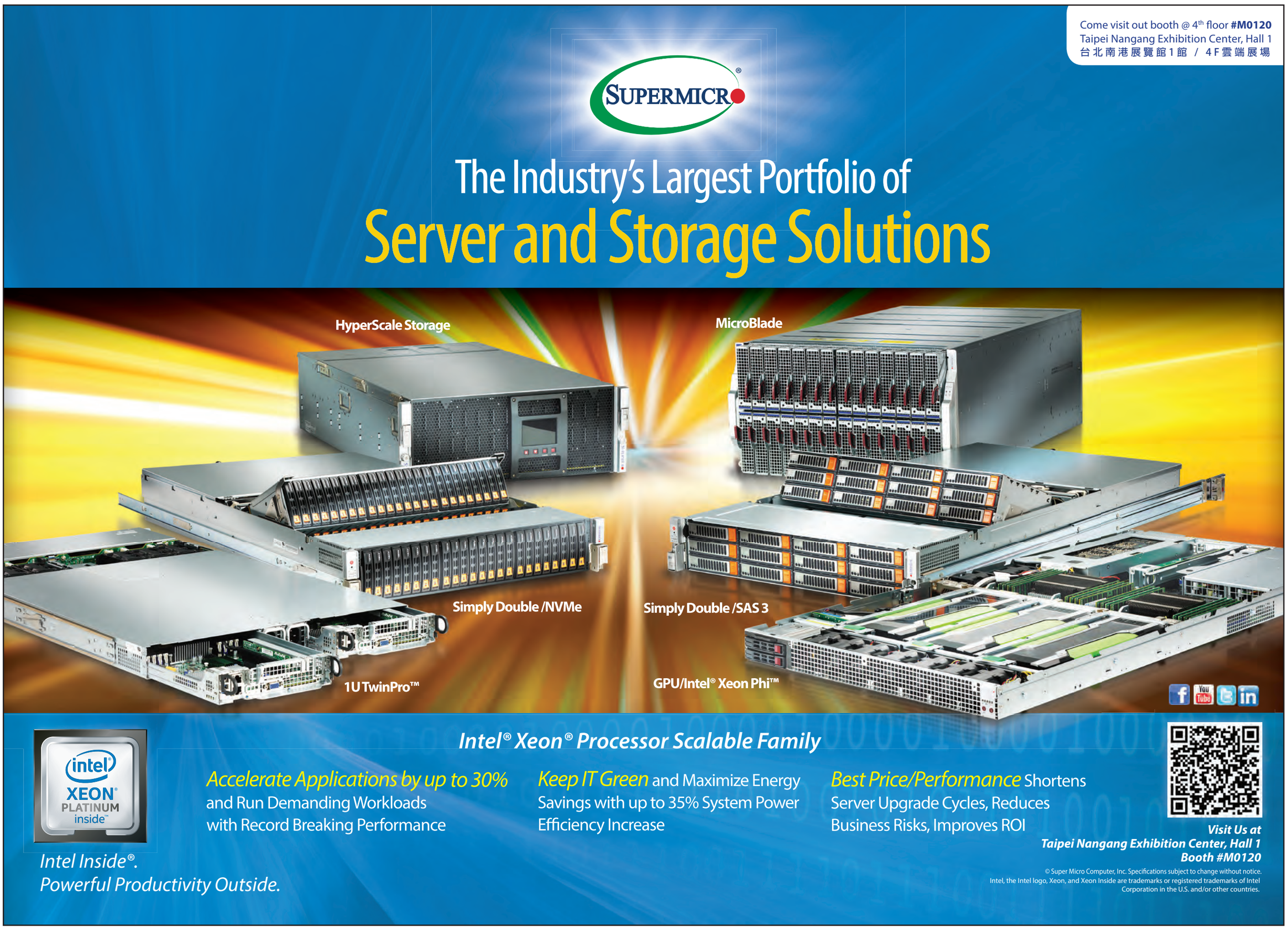
The machine is a flight simulator with a third-party head-mounted display (HMD) and is fully designed and built by the graphics card department. Gigabyte also sees business opportunities in such a machine and is currently still figuring out how to commercialize it.

Gigabyte has seen some demand for the machine from the VR arcade or experiencing center markets. As for HMD products, the company currently does not have an interest in making one since most of the available VR technologies are owned by Valve and Gigabyte does not see the necessity to create a product that is almost identical to products from competitors like HTC.

Gigabyte's main focus for VR-related products is peripherals that are able to further strengthen the experience of existing VR platforms such as the VR simulators Gigabyte displayed last year and will showcase this year.

Through Aorus' new identification and the whole series of Aorus products, Gigabyte is also hoping to let its buyers know that the company has always been listening to their feedbacks and demands and wishes to operate in the market with their support.

This is also the key focus for Gigabyte's marketing for Aorus. Gigabyte does not wish Aorus to become just a brand only with a purpose of attracting consumers to purchase products, but a communication tool, allowing Gigabyte to deliver what users want and achieve goals with users together.



Conexant prevails in the voice as an interface market

Press release

Driven by Amazon Echo and its Alexa Voice Service (AVS), voice has quickly become the most compelling user interface in a wide range of smart home and IoT devices. After working with Amazon to launch its 2-mic development kit for Amazon AVS last December, Conexant has successfully gained a strong foothold with its AudioSmart technology in the voice as an interface market. Now, with the availability of its new 4-mic development kit for AVS, Conexant will further expand its presence in the market and is ready to embrace for the tremendous opportunities ahead as the voice-enabled revolution expands.

The only development kit provider for Amazon AVS

"It's a big honor for Conexant to be the only development kit provider for Amazon AVS," Saleel Awsare, President of Conexant, said, when asked about the cooperation with Amazon. "Amazon has evaluated many solutions and the reason that we were chosen is due to our comprehensive and excellent voice processing technologies, including our processor DSPs, CODECs, and software."

He explained that enabling speech recognition and voice control from a distance in smart platforms requires overcoming substantial challenges related to echo cancellation, background noise, microphone speaker position and more.

Conexant's far-field voice input processor solution for voice interactive devices is an industry first. It can separate voice commands from background noise so that the speech recognition engines hear user commands as clearly as possible, which in turn provides a far more accurate voice-enabled experience, even in noisy, real-world conditions, up to several meters away from the target device.

At the heart of the newly-announced 4-mic development kit for Amazon AVS is Conexant's AudioSmart CX20924 Voice Input Processor running Conexant's far-field voice pre-processing software technology. Similar to the 2-mic voice Input Processor, CX20921, Conexant's far-field voice input processor focuses on the user's voice and removes echoes and noise from the audio signal, providing clear voice requests for speech recognition processing.

Multiple design wins

In fact, Conexant has already gained multiple design wins over the last few months by the explosive growth in third-party devices with Amazon Alexa featuring Conexant's voice processing solutions.

According to Awsare, Conexant already has more than 40 design wins based on the 2-mic and 4-mic solutions for AVS and it includes a wide variety of devices, such as home appliances, robots, home audio/video, home networking

▲ Saleel Awsare, Conexant president

devices, security devices, and toys.

Korean telecom corporation, KT, also utilizes Conexant's far-field voice input processor in its GiGA Genie voice-controlled virtual assistant media hub. Asustek's recently-announced Zenbo Robot also utilizes AudioSmart software. As for the China market, Awsare said that they are now in talk with the top Internet service providers and a major announcement will be made in a few months.

▲ Conexant's AudioSmart technology will make voice interface more pervasive in a wide range of smart home and IoT devices.

clientron
embedded system provider
Welcome to visit Clientron at
Booth K0427a
TWTC Nangang Exhibition Hall 1
Thin Client Solution
TAIWAN EXCELLENCE 2017
POS Solution
The world-leading manufacturer of Thin Client, POS and embedded systems
Clientron
COMPUTEX TAIPEI
www.clientron.com

Liyitec presents automotive and large-size touch solutions

▲ Liyitec's 34-inch R1900 curved touch panel, the ultimate HMI solution for high-end curved monitor.

Press release

Specialized in large-size touch panel development, Liyitec presents the new patented low-resistance touch solution at Computex 2017 (TWTC, Hall 1C0535). The resistance of 34-inch projected capacitive touch panel with traditional design, for example,

▲ Liyitec's laminated safety glass product has passed BS 857:1967 test.

is typically 25k Ω. With Liyitec's patented design, the resistance is reduced to only 700~800Ω, only 3% of the traditional design. This new design of ultra-low resistance has unleashed the potential of extra-large touch solution.

Safety always comes in first priority, so is the design of touch panel. Liyitec provides laminated safety glass (LSG) in a wide range of applications. With anti-shatter design, Liyitec's LSG protects users from getting hurt when glass is broken. Liyitec has implemented this technology in its industrial and automotive applications (BS 857:1967 passed – 85 joule test). Such safety design will become a must in the next generation HMI.

Optical mirror coating is another new products Liyitec exhibits this year. With this coating, the panel becomes a mirror when the monitor is off, and a touch screen when the monitor is back on. Liyitec is able to provide optical mirror coating design with other special design together (such as curved, anti-UV and irregular shaping).

This year Liyitec presents the ideas of performance, safety, light weight, curve, and decoration in its products. In contrast to the traditional square panel with black border, Liyitec's capability in producing a wide range of variability satisfies the ever-changing demand in industrial applications such as car, education, medical care, military, gambling.

innodisk
Still Haven't Found It?
innodisk
Industrial
2.5" SATA SSD
3MV2-P
Series
SATADOM-SV 3TE4
SATADOM-ML 3MS4 Series
CFast Industrial 3TE4
4GB DDR4 2400 ECC VLP SODIMM
M4DS-4GSSICGJ-E
We are here to help!
Innodisk offers innovative and ingenious storage solutions for the industrial and embedded market.
Venue: Taipei Nangang Exhibition Center, Hall 1
Booth #J0818

QNAP
2017
COMPUTEX TAIPEI
— Innovation Beyond Expectation —
Meet QNAP at Booth No. J1217
QNAP TS-653B
Total 10GbE Solution
10GbE Ready
QNAP

DIGITIMES

Low power 802.11ad technology: Tensorcom and Mr. Loop offer complete solutions for notebooks, mobile, and VR products

Press release

As consumer devices continue to evolve in capabilities and performance, the demand for data is accelerating exponentially. In less than a generation video has gone from broadcast TV that is passively consumed standard definition to 4k, real-time video capture and sharing between battery powered mobile devices. Data consumption, storage, and transfer is now measured in terabytes. We live in an increasingly wireless world, and consumers demand seamless access to their information across devices, platforms, and time zones. This unending surge in data consumption and desire for portability is creating opportunities for new wireless standards.

Wi-Fi adoption and the advancement to the current 802.11ac standard was accelerated by the growing popularity of high speed internet connections in the home and connection between different devices. However, Wi-Fi still cannot replace cabled solutions for video or data due to interference that results in varying data rates and poor reliability. Current 5 GHz Wi-Fi solutions also cannot match the data rates offered by wired high-speed interface like SATA, HDMI, USB 3.0, and Gigabit Ethernet.

802.11ad, also known as WiGig, operates in the 60 GHz frequency spectrum and promises robust multi-gigabit data transmission rates and is not affected by the increasingly crowded Wi-Fi traffic in the 2.4 and 5 GHz spectrums. The atmospheric absorption properties and short wavelength of 60 GHz require connections to be established in near-line-of-sight conditions, but also offers added link robustness and bitrate efficiency in these environments. 802.11ad is well suited for high-bandwidth, in-room high speed data and video cable replacement applications as well as 'last-mile' small cell infrastructure designs.

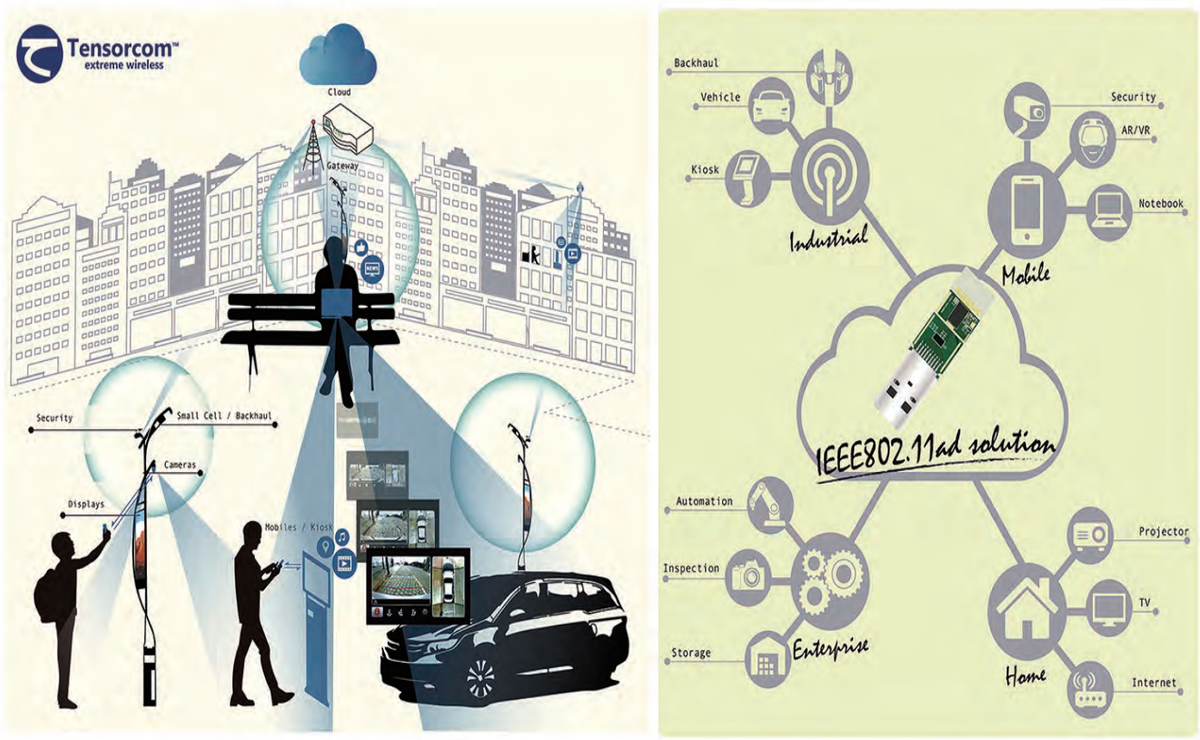
Tensorcom IC solution

Tensorcom is leading the industry in highly integrated, ultra-low power 802.11ad solutions. The latest generation TC60G6504UE "Nant1" 802.11ad System-On-Chip integrates and 60 GHz CMOS MAC/PHY and USB 3.0 controller/PHY and includes all functions required to implement a complete WiGig solution for embedded devices, accessories, and portable products that require gigabit-per-second wireless data rates.

Tensorcom integrates these cost effective SoC solutions in fully integrated adapter reference designs and system-in-package (SIP) configurations for maximum flexibility to support a variety of portable product designs.

Mr. Loop Design solutions

Mr.Loop delivers ultra-low power and gigabit speed products based on Tensorcom's integrated 802.11ad



▲ Ultra low power 802.11ad solutions by Tensorcom

from Mr.Loop design eliminates directional limitations for WiGig connectivity and is ideal for mobile VR. Customized solutions that enable multiple interfaces like BT1120 / UART /SPI / I2C and HDMI are offered on Mr.Loop solutions.

As the demand for bandwidth continues to increase in portable devices, WiGig will be a key technology trend that OEMs will choose to differentiate flagship products.

More information on 802.11ad solutions from Tensorcom and Mr.Loop is available at Taipei Nankang Exhibition Center, 1st Floor, Booth J0818 during Computex 2017.

Talkase T3 – a credit card-sized 3G phone with Wi-Fi hotspot feature

Press release

Leading handset makers are scrambling to add all kinds of fancy functions to their phones for the purpose of boosting sales. The ever growing screen size is one example. However, do most consumers really need such intricate designs and functions? When the initial marketing frenzy wanes, perhaps many people will return to their senses and find that a simple lightweight phone enabling them to make calls and send text messages is enough to meet the needs of most use scenarios.

◀ **The Talkase T3 supports 3G communications and Wi-Fi hotspot sharing with 72 hours of battery life.**

Looking back to the rise and widespread popularity of handsets, it is certain that they have become popular consumer products because they enable people to communicate anytime anywhere. The Talkase T3 3G card-sized phone is a simple feature phone that eliminates all the hassles.

It can also turn into a Wi-Fi hotspot for smartphones and all types of other smart devices that people nowadays often carry along.

The Talkase phones were successfully funded on Kickstarter in 2014 and are now available on the market in volume. Looking similar to a small calculator, the credit card-sized phone fits in the pocket and wallet. Keeping with the slim and lightweight design, the Talkase phone also features sleek style and color choices.

In terms of functions, the Talkase T3 supports 3G communications and Wi-Fi hotspot sharing with 72 hours of battery life. Charging is done via a magnetic Micro USB charging connector and one charge supports 72 hours of battery life on standby. The major change introduced to the latest generation Talkase T3 is the support for 3G and Wi-Fi hotspot feature.

For users already with a company phone, the Talkase T3 can serve as a back-up phone. For users having to go into areas banning the use of phones with photo-taking functions and Internet connections, the Talkase T3 can be used as a feature phone that serves just the purpose. The Talkase T3 3G card-sized phones will go on sale in Taiwan in June for US$79.

Leadtek showcases full spectrum cloud solutions leverage deep learning technology by eyeing surveillance, smart healthcare and gaming titles distribution

Sponsored content

With its GPU-based graphics add-on card product quality steadily reaching new heights and its customer services getting stronger, Leadtek decided to expand into cloud services and healthcare solutions since 2000 and gradually penetrated into the market with a series of certifications including Taiwan Ministry of Health and Welfare, United States FDA and EU medical institutions. Lu Kun-Shan, President of Leadtek, talked about the prospects of the company new developed hybrid cloud solutions in Computex Taipei 2017 during this exclusive interview.

Versatile cloud services leveraging Deep Learning technology

With the rise of deep learning technology solving challenges across different types of industries, it is an exciting time for our customers as we are refreshing our products In Computex 2017, said Mr. Lu. Under several years' development, Leadtek's cloud solutions have been well integrated with VDI by leveraging full line of high-performance display systems including optimizing hardware configuration using NVIDIA's GRID technology for visual computing applications.

Furthermore, cloud storage gives power to access videos from anywhere and a larger storage capacity than the local recording devices. For better assist telecoms and system integrators of video surveillance and security IP camera applications to solve ever-increasing amounts of data streams, Leadtek engineering team uses OpenStack based infrastructure service to provide the distributed, scale-out cloud storage capability through the public cloud. With the virtualization and the scale-out OpenStack technology, Leadtek is strongly delivering this key message this Computex for audiences.

amorRunner Cloud services help physicians

Integrating a broad range of measurement devices and real-time online health consultation services, Leadtek aims to deliver the real-time health cloud home care solution with major medical centers in Taiwan. With this solution, users will be able to use DxPatch, a dedicated ECG and Heart Sound Patch, to measure heart rate, heart sound which also combined with other related information such as blood pressure, blood glucose, uploaded to the amorRunner Cloud health management platform through private cloud services.

This cloud platform provides further analysis features in order to let physicians studying the data to find possible causes, symptoms and providing treatment Options. This year, this service has turned to a paid service through the corporate projects with several hospitals. The commercial values of amorRunner Cloud Services have been well recognized by patients and boost the revenue incomes for Leadtek in the second half 2017, Lu talks very optimistically and proudly.

In addition to amorRunner cloud services, Leadtek has also integrated positioning service and video surveillance technologies in the smart home care solutions. For patients recovering at home after surgery, the solutions also offer medical wearables to detect results so physicians can provide remote care for patients when issues occur. This will help Leadtek to expand the services to local clinics or rural hospitals in the future.

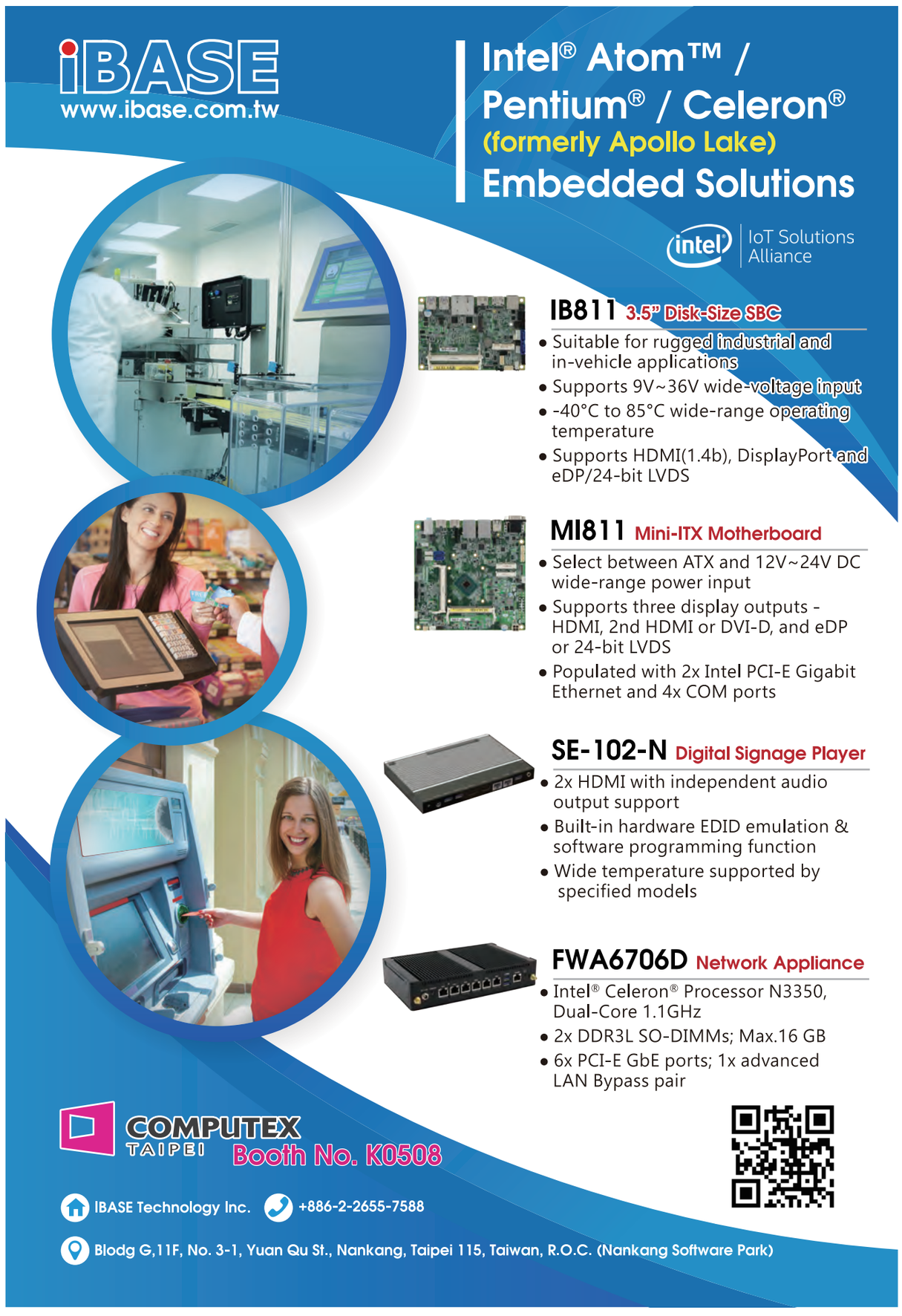
Through the integration of the healthcare products and features such as physiological data measurement, home safety surveillance, physical exercise facilitation and professional teams to corporate with hospitals, Leadtek has created a well-rounded cloud service for health and safety care. In the next step, Leadtek will also strive to optimize professional services utilizing medical big data analytics and deep learning technology in its healthcare integration.

▲ **President of Leadtek Inc, Mr. Lu Kun-Shan talks about cloud solutions and Leadtek showcase of Computex 2017**

A big boost of Kingdom Under Fire 2 gaming official release

This Year in 2017, the new updated online gaming title "Kingdom Under Fire 2(KUF2)" will hit the market after the formal release on May 25th 2017. The KUF2 is an action strategy video game developed by Blueside which merge RTS, RPG and MMO configuration. Leadtek has signed a distribution partnership contract and start promoting KUF2 covering Taiwan, China, Hong Kong, Macau and south east Asia market.

The demonstration of Leadtek products will be viewed from May 30th through June 3rd 2017 at the booth number A0422 of Taipei World Trade Center (TWTC) Exhibition Hall 1.



...Continued from page 4

Makers

Thanks to increased Chromebook orders from Acer, HP and Lenovo and the fact that its major clients HP and Apple both performed rather well compared to other vendors, Quanta Computer managed to achieve a sequential shipment drop smaller than Taiwan's average in the first quarter.

Compal Electronics' shipments were down 11.5% sequentially in the first quarter, also smaller than Taiwan's average thanks to support from Dell's orders.

Quanta will benefit the most from Chromebook's strong shipment growth in the second quarter and the maker's overall shipments are expected to increase 8.8% sequentially to reach more than 10 million units.

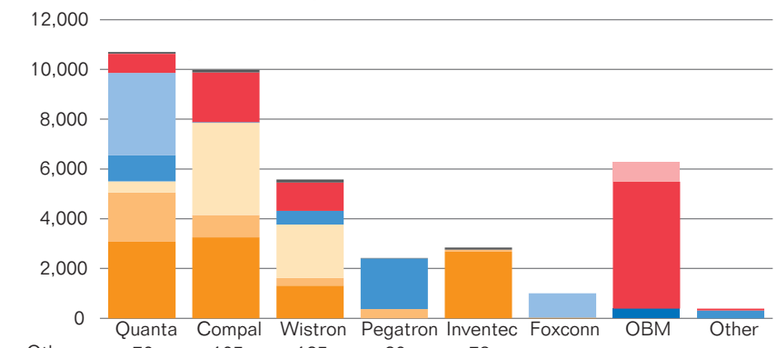
Although Compal and Wistron have also started landing Chromebook orders, over 70% of the worldwide Chromebook shipments will still be supplied by Quanta in the second quarter.

Since Asustek will not see much growth in its notebook shipments, Pegatron Technology, which heavily relies on orders from the vendor, will see its volume stay flat from a quarter ago in the second quarter.

Inventec will be the only Taiwan-based maker to see sequential decline in second-quarter shipments mainly due to a loss of orders from HP.

Microsoft's Surface Laptop is manufactured by Pegatron, but the orders are unlikely to be significant until after the third quarter.

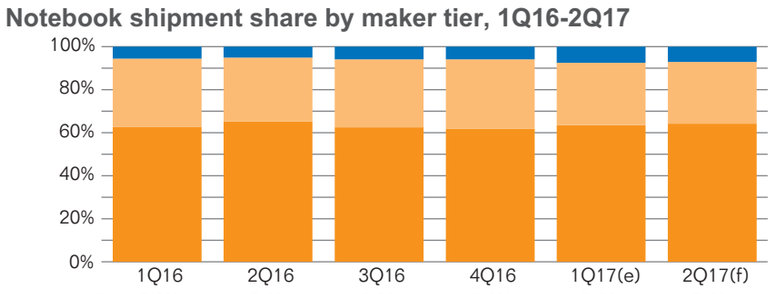
Vendor-maker partnership, 4Q16 (k units)



	Quanta	Compal	Wistron	Pegatron	Inventec	Foxconn	OBM	Other
Others	70	105	125	20	78			
Samsung							775	
VAIO	11						7	
Lenovo	766	1,995	1,132				5,100	75
Apple	3,305					980		
Asustek	1,045	30	550	2,035				312
Toshiba							385	
Dell	450	3,700	2,150					
Acer	1,980	900	310	373	90			
HP	3,077	3,252	1,310		2,674	24		

Source: Digitimes Research, May 2017

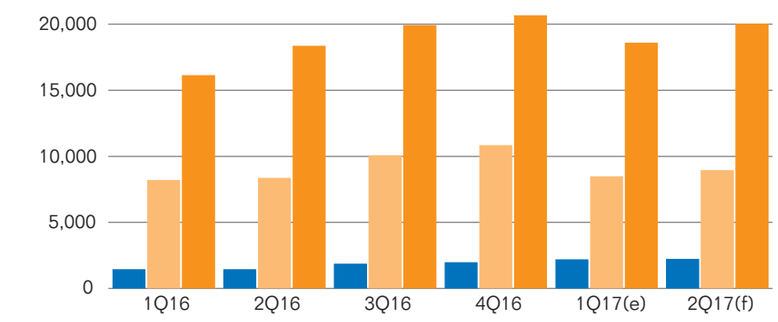
Notebook shipment share by maker tier, 1Q16-2Q17



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Non-top 5	5.6%	5.1%	5.9%	5.9%	7.5%	7.1%
Top 3-5	31.8%	29.7%	31.6%	32.4%	29.0%	28.7%
Top 2	62.6%	65.2%	62.5%	61.7%	63.5%	64.2%

Source: Digitimes Research, May 2017

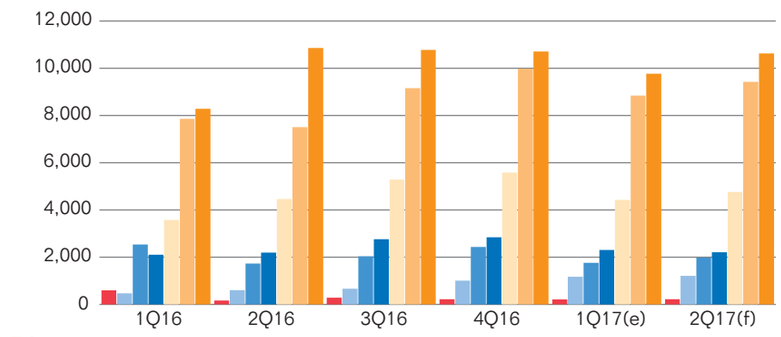
Notebook shipments by maker tier, 1Q16-2Q17 (k units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Top 2	16,140	18,363	19,929	20,686	18,603	20,046
Top 3-5	8,212	8,374	10,077	10,847	8,483	8,949
Non-top 5	1,444	1,444	1,878	1,979	2,196	2,229

Source: Digitimes Research, May 2017

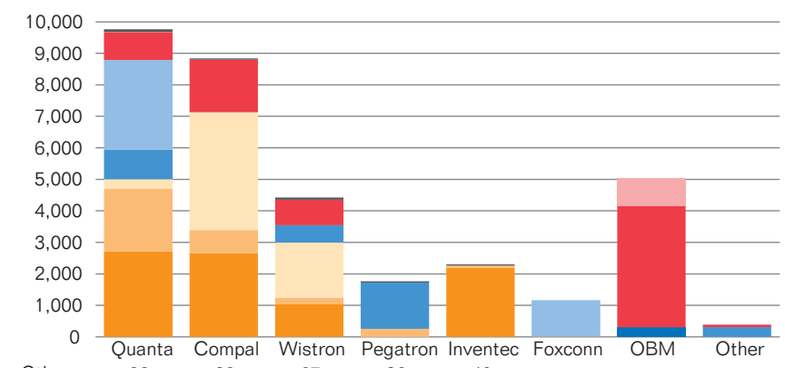
Top makers' notebook shipments, 1Q16-2Q17 (k units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Quanta	8,284	10,859	10,775	10,704	9,765	10,624
Compal	7,856	7,504	9,154	9,982	8,838	9,422
Wistron	3,575	4,459	5,283	5,577	4,419	4,762
Inventec	2,102	2,190	2,760	2,842	2,302	2,205
Pegatron	2,535	1,725	2,034	2,428	1,762	1,982
Foxconn	470	600	661	1,004	1,168	1,203
ECS	480	130	230	180	170	176

Source: Digitimes Research, May 2017

Vendor-maker partnership, 1Q17 (k units)



	Quanta	Compal	Wistron	Pegatron	Inventec	Foxconn	OBM	Other
Others	88	39	67	36	40			
Samsung							870	
VAIO	10						6	
Lenovo	878	1,660	807				3,850	77
Apple	2,850					1,160		
Asustek	936	1	550	1,473				310
Toshiba							300	
Dell	310	3,750	1,750					
Acer	1,980	730	215	253	67			
HP	2,713	2,658	1,030		2,195	8		

Source: Digitimes Research, May 2017

Chromebook

Worldwide Chromebook shipments were strong in the first quarter, growing by double-digit percentages both on quarter and on year.

Acer shipped over 900,000 Chromebooks in the first quarter due to its expansion in North America's education sector. Acer has been keen on participating in the development of educational content in North America, allowing its Chrome-related product lines to become more competitive against competitions.

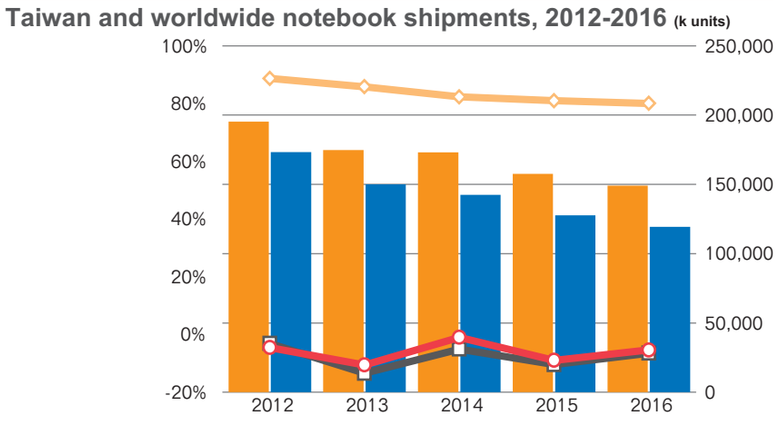
HP and Lenovo each shipped over 400,000 Chromebooks in the first quarter with orders mainly from the education sector.

Dell's shipments in the first quarter were much weaker than the same quarter a year ago. Shipments from Dell, Samsung and Asustek were between 100,000 and 200,000 units each.

In the second quarter, Chromebook shipments are expected to grow over 30% sequentially to reach a new high at more than three million units.

The growth will be driven by preparations for back-to-school demand, increasing demand from small- to medium-size enterprises and new products from major vendors.

Taiwan and worldwide notebook shipments, 2012-2016 (k units)

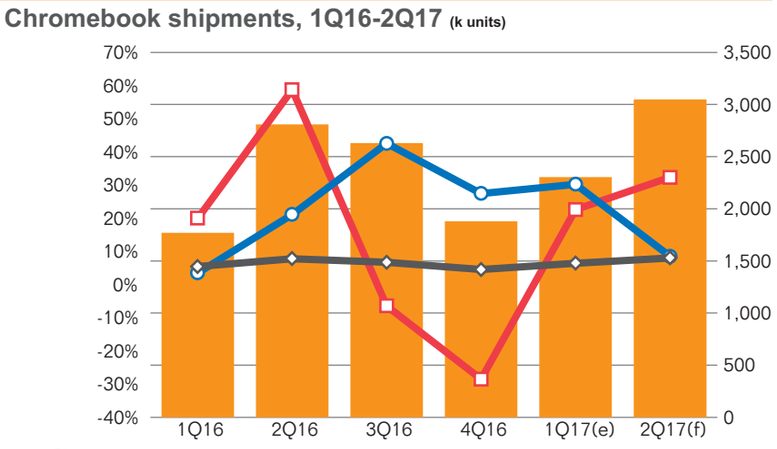


	2012	2013	2014	2015	2016
Taiwan shipments	173,258	149,968	142,432	127,606	119,373
Worldwide shipments	195,360	174,799	173,078	157,613	149,142
Taiwan Y/Y	-3.1%	-13.4%	-5.0%	-10.4%	-6.5%
Worldwide Y/Y	-4.5%	-10.5%	-1.0%	-8.9%	-5.4%
Taiwan share	88.7%	85.8%	82.3%	81.0%	80.0%

Source: Digitimes Research, May 2017

Annual shipment

Chromebook shipments, 1Q16-2Q17 (k units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Shipments	1,770	2,810	2,630	1,880	2,305	3,050
Q/Q	20.0%	58.8%	-6.4%	-28.5%	22.6%	32.3%
Y/Y	3.5%	21.1%	42.5%	27.5%	30.2%	8.5%
Share in NB	5.4%	7.8%	6.7%	4.5%	6.4%	8.0%

Source: Digitimes Research, May 2017

Stay one step ahead of the competition: DIGITIMES Research gives you an edge in the Greater China market

DIGITIMES Research Tracker services

Digitimes Research Tracker services are annual subscription services that focus on shipment analysis and forecasts in key mobile device industries, namely:

- CHINA SMARTPHONE AP TRACKER
- CHINA SMARTPHONE TRACKER
- GLOBAL TABLET TRACKER
- TAIWAN MOBILE DEVICE TRACKER
- TAIWAN LCD PANEL TRACKER
- TAIWAN DISPLAY SYSTEM TRACKER

Latest research notes:

- AMOLED to become mainstream smartphone panels
- Top-5 notebook vendors see 6% on-year growth in April shipments
- China vendors to ship 152 million smartphones globally in 2Q17
- 9W LED light bulb prices in China rise in April
- 5G commercial use to take off ahead of schedule
- SEL outstanding amid Japan-based exhibitors at Finetech Japan 2017

Annual tracker services

Delivered on a quarterly basis, the tracker services focus on shipments of products for the most recent quarters, as well as providing a forecast for the upcoming quarter, so customers understand where the market is heading.

Market insights

Delivered on a frequent basis, articles include ***blog posts*** and ***research notes*** that help subscribers understand the trends that shape the industry.

About DIGITIMES Research

DIGITIMES Research is the research arm of DIGITIMES Inc., Taiwan's leading high-tech media outlet. Operating as an independent business unit, DIGITIMES Research has for years maintained a close relationship with a broad scope of industry professionals, from engineers, sales, procurement managers, to executives in the Greater China region as well as the global brands, distributors, IC design houses and IP firms that do business in Greater China.

Inquiry: sandy.huang@digitimes.com
Phone: +886-2-87128866
Fax: +886-2-87123366

www.digitimes.com/reports

DIGITIMES Media · Marketing · Consulting

Colorful and Chaintech showcase latest iGame Vulcan high-end graphics cards

Press release

China's No. 1 hardware brand Colorful Technology joins forces with Chaintech to exhibit its high-end brand iGame series at booth M1019A at Computex 2017. Tailored for gaming, iGame is Colorful's only graphics card series with a high-end market position and a No. 1 market share in the brand market. It is officially launching on the worldwide market in 2017 with shipments to Southeast Asia and Korea rapidly on the rise.

Colorful has 20 years of experience in the DIY computer market and has accumulated extensive R&D capabilities in graphics cards, motherboards, and storage devices. Colorful is able to build on top of the solid experience and continue to introduce innovative and revolutionary product designs that amaze the industry. This has given rise to Colorful's No. 1 market share in the brand graphics cards market 14 years in a row. Furthermore, Colorful participates in a variety of gaming events to engage gamers. It not only organizes gaming competitions through Colorful Gaming Union itself but also takes part in international e-sports competitions to boost the iGame brand awareness.

At Computex 2017, Colorful is showcasing iGame GTX1080Ti Vulcan X OC – a graphics card with an LCD display – in addition to iGame GTX1080 Vulcan X OC, iGame GTX1070 Vulcan X OC and iGame GTX1060 Vulcan X OC 6G of the Vulcan series. Furthermore, the high-end iGame GTX1080Ti Kudan that opens the eyes of heavy gamers will also be on exhibit along with the Neptune and Customization series.

Colorful's iGame GTX1080Ti Vulcan X OC is powered by the advanced Pascal GP102 GPU, featuring a one-key overclock of 1620MHz and a boost clock of 1733MHz and 11G GDDR5X 352-bit memory. It is equipped with a high-performance power supply for the GPU core and memory, the SWORIZER cooler, 1.68 million color-capable RGB lighting, and PCB protected with high-strength alloy.

The cooler is built in with the iGame Status Monitor which shows the core frequency, core temperature, fan speed and memory usage during operation. The core usage and load level is displayed in the form of a load bar so the user can stay aware of the current operating condition of the graphics card.

▶ Colorful iGame GTX1080Ti Vulcan X OC graphics card

Visitors to COMPUTEX will also have a chance to see iGame CP600 – a PCI-E solid-state drive purpose-built for gaming by the outstanding iGame R&D team and also the first SSD of the iGame brand. The original design of iGame CP600 is based on "The Lord of Loading" concept with heat dissipation fins specifically for gaming, the eye-catching alloy laser carved iGame logo with a diagonal pattern, and the flame-like dazzling light decorations. It supports high-speed interface and high-performance heat dissipation to achieve fast cooling.

Colorful will continue working on technology innovations, channel expansions, brand publicity enhancements and international market developments. As Colorful places great importance on its new product announcements and exhibitions at Computex 2017, Shan Wan, Chairman of Colorful, will personally attend Computex 2017. Colorful is at booth M1019A.

I-PEX connectors: radio communications and electromagnetic interference mitigation

Press release

Electromagnetic interference is a primary cause for a device's failure to communicate. When high data rate differential graphics signals are transferred through a connector, the contacts radiate electromagnetic fields like an antenna. As the speed of the data rates continues to increase, then the radiating frequency of the noise from the graphics connector also increases.

Enhanced shielding designs of the graphics connectors like the I-PEX CABLINE-CA II Micro-Coaxial Cable Connector (accepts co-axial wire sizes up to AWG36 with controlled impedance of 45 ohms) and the I-PEX NOVASTACK 35-HDP Shielded Board-to-Board FPC Connector (accepts FPC [flexible printed circuit] on the plug connector and rigid PCB on the receptacle connector) have added shielding that eliminates the unwanted, radiated noise.

▼ I-PEX CABLINE-CA II and I-PEX NOVASTACK 35-HDP

The noise from the unshielded graphics connector effects wireless communications called Long Term Evolution (LTE) that are enabling the Internet of Things (IoT) marketplace. LTE is controlled by the 3rd Generation Partnership Project (3GPP) which united seven telecommunications standards. For example, it covers all GSM (including GPRS and EDGE), W-CDMA (including HSPA) and all LTE specifications.

Two types of LTE are available: the paired LTE-FDD uses Frequency Division Duplex paired spectrum techniques. For example, the uplink band 10 MHz wide at 2.6 GHz and a paired 10 MHz wide band at 2.72 GHz require two 10 MHz wide frequency bands. The unpaired LTE-TDD uses Time Division Duplexing and requires only one frequency band that switches up and down taking turns like when playing tennis and is allowed to vary the up/down ratio.

Some spectrum (frequencies) are licensed (paid) where the operator has exclusive rights for a certain frequency range which is used by LTE and other cellular systems since the operator can control the interference of that frequency range. Unlicensed spectrum is free, but open to all and crowded causing unpredictable interference. To expand coverage the operator may use a combination of both licensed and unlicensed spectrum.

An example of possible predicted interference: the paired LTE-FDD example uses two frequency bands: Uplink Band -- 2.6 GHz, Downlink Band -- 2.72 GHz.

Now consider that the new device designs use 4K2K resolution displays driven by 4-Lanes of eDP differential lanes at 5.4 Gbps. The primary radiated emissions expected from the 5.4Gbps graphics data differential lanes is at their Nyquist frequency of 2.7 GHz which is the same as the LTE-FDD Downlink frequency of 2.72GHz. We can expect that they will interfere with each other if they are not isolated from each other.

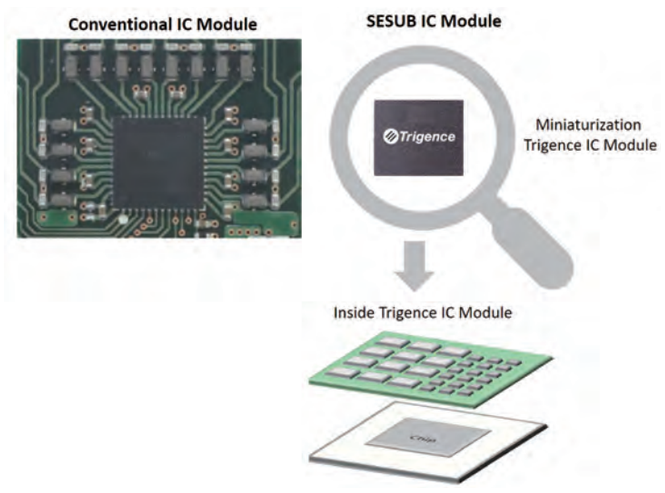
Trigence to launch the first audio IC module based on TDK SESUB process at the Grand Hyatt Hotel during Computex Taipei 2017

Press release

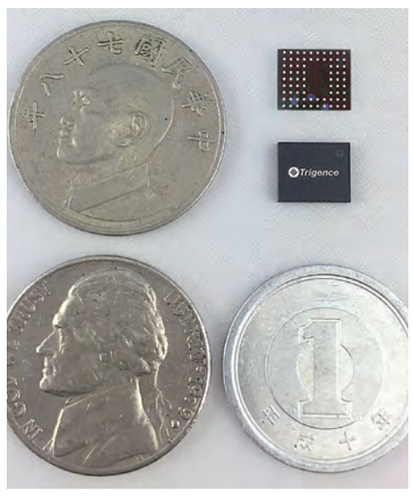
Trigence Semiconductor, a pioneering audio IC design and solution provider, today launched the world's first Audio IC Module (ICM) based on TDK's advanced SESUB (Semiconductor Embedded SUBstrate) packaging technology at the Grand Hyatt Hotel (Taipei, Taiwan). By employing TDK's SESUB process, Trigence has been able to deliver a fully integrated, all-in-one audio output solution for incorporation into Digital Speaker Modules. The ICM significantly reduces footprint requirements for and audio output stage, allowing it to be combined directly onto the electro-mechanics of consumer micro-speakers turning the speaker into an independent digital component, or Digital Speaker. The benefits of Digital Speakers include improved audio quality, simplified system design, and reductions in active power consumption.

Trigence's Audio ICM is a highly-integrated system. It combines volume control, 11-band audio equalizer, audio DSP, Dnote speaker driver, EMI filter, all passive components and the latest SoundWire interface for computer portable audio applications. The Trigence Audio ICM also embeds several unique and proprietary signal processing algorithms to enhance sound quality and loudness without the need for any hardware or acoustic design changes.

Digital Thiele-Small Parameter Correction (DTSC) technology offers firmware control over the Theile-Small characteristics of the loudspeaker, giving the ability to mimic changes in parameters such as diaphragm size or mass, driving force imparted by the magnet on the voice-coil, and acoustic cavity size. These changes can be used to improve acoustic quality of the speaker, earphone or headphone through real-time digital signal processing. Alternatively, DTSC can be used to match the acoustic characteristics of similar sized speakers from different manufacturing lines.



▲ Fully integrated and miniaturized Trigence audio IC module



▲ Trigence First audio IC module based on TDK SESUB process

Our Digital Assist (D-Assist) algorithm is designed to protect the speaker from damage when driven beyond its typical rated limits. D-Assist works to maintain a preset maximum internal temperature within the speaker cavity, and to prevent over-excursion of the speaker diaphragm. Unlike similar Smart-Amp algorithms, D-Assist does not employ the use of low-frequency probe-tones which degrade the power efficiency of the driving circuitry. Rather D-Assist employs a unique all-digital sensing and control methodology that maintains efficiency while still offering maximum loudness and protection from the loudspeaker in real-time.

The SESUB packaging technology from TDK utilizes ultrafine processing techniques and materials technologies. TDK's SESUB solution provides numerous advantages, such as high-density mounting, package miniaturization, better thermal dissipation, low noise emission and greater design flexibility and inter-chip connection.

"This is a significant milestone for Trigence to launch our first Audio IC Module based on TDK's SESUB process," said Pete Birch, Chief Executive Officer of Trigence Semiconductor, Inc. "Through our partnership and cooperation with TDK, we have been able to deliver a market leading solution for the latest portable and handheld consumer devices. SESUB allowed us to create the smallest possible Audio ICM, allowing us to develop DSMs not only for desktop size systems but also micro-speaker sizes as small as the 16mm x 9mm solutions found in today's handheld products The availability of our SESUB Audio ICM has enables us to deliver the enhanced benefits of Digital Speakers and DSMs to today's consumers.

"TDK is extremely pleased with the result of our cooperation with Trigence," said Mr. Masahiko Hayashi, SESUB BU Leader of TDK. "TDK's SESUB technology has now been proven by many customers and IC vendors to deliver the best cost v size trade-off in today's high-density packaging technologies. With the growing demand for weight-reduction and miniaturization in portable devices in the future, we believe SESUB has huge potential."

Request a Private Demonstration:

Trigence DSMs and "Pure Digital" audio solutions, along with our IC–Dnote DU1213, DN30x2 ICs will be on display during Computex 2017 at the Grand Hyatt Hotel (2, SongShou Road, Taipei, Taiwan) May 31 to June 2 . To request a private meeting and demonstration, please contact contact@trigence.com.

About Trigence

Trigence Semiconductor, Inc. is a pioneering audio IC design and solution provider, offering revolutionary "pure digital" audio products for the consumer and IT markets. Founded in 2006 as a spin-off from Hosei University and headquartered in Tokyo, Japan, Trigence received its first investment in 2012 from Intel Capital based on the potential for its unique Dnote audio technology to transform the PC audio market. Other subsequent investors include INCJ (Innovation Network Corporation of Japan), NEG (Nittoku Engineering Group) and TDK Corporation. *Dnote is a trademark of Trigence Semiconductor in the United States and other countries.

Website: www.trigence.com

About TDK

TDK Corporation is a leading electronics company based in Tokyo, Japan. It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's portfolio includes passive components, such as ceramic, aluminum electrolytic and film capacitors, ferrites and inductors, high-frequency products, and piezo and protection components, as well as sensors and sensor systems and power supplies. These products are marketed under the product brands TDK, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK's further main product groups include magnetic application products, energy devices, and flash memory application devices. TDK focuses on demanding markets in the areas of information and communication technology and automotive, industrial and consumer electronics.

The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2017, TDK posted total sales of USD 10.5 billion and employed about 100,000 people worldwide.

Clientron showcases multiple Thin Client and POS products

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 2017. Clientron unveiled its new industry Thin Client IT900 with industrial PC quality, R800 and Q800 for streamlined Thin Client applications. Meanwhile, Clientron is showcasing its all POS series including the brand new innovative dual-touch displays POS terminal-Duo650 for enhancing the user experience.

At this show, visitors can view the benefits of green technology, innovative design, and reliable quality that Clientron brings for your applications. A variety of industrial scenarios are being displayed including the intelligent system IT800 for parking lot remote management systems, the high performance Thin Client R800 for medical care solutions, as well as demonstrating POS systems for restaurant, self-check, meal ordering solutions, cinema ticket port scenarios, POS with UHF RHID reader applications, and the NFC cold chain logistics temperature recording applications etc.

In terms of thin clients, Clientron is showcasing a complete lineup of Thin Clients for entry-level, mid-range, high-end and smart applications including industrial Thin Clients IT800 and IT900 with fanless, IP40 dust-proof and robust aluminum housing design to sustain harsh conditions in outdoor or semi-outdoor environments, such as factories and parking lot management systems. They additionally support flexible selections of I/O expansion for peripherals as well as WWAN and WLAN connections and can therefore enable a wide range of uses including IoT applications. Furthermore, the new mainstream Thin Client R800 - based on the new generation Intel Braswell Refresh quad-core processor - supports triple display outputs, has an innovative rotating ports-on-foot design and features an optional TPM (Trusted Platform Module) to provide a higher level of security protection. In addition to the lightweight series, there is Q800 available for selection for the high-end and flexible model F620 with 4K definition and up to quad displays to meet the requirements of the healthcare and multimedia sectors.

In addition, Clientron is displaying its entire POS product portfolio. For all-in-one POS terminals, Clientron is presenting the innovative Duo650, which is distinguished from common POS by featuring two upright touch displays bonded back-to-back. The upright dual display design saves hardware costs. The ultra-slim form factor also saves counter space. The touch control function on the customer display also enables customers to perform some operations such as seat selection at movie theaters or airport check-in counters.

Another focus on the show, the Bello POS, recently recognized with the 2017 Taiwan Excellence Award, has a flexible second screen design supporting the possibility of adding two customer displays. The system can also integrate an NFC reader to support multiple payment solutions and thereby enhance the user experience.

To know more about Clientron's design, manufacturing capabilities and services, please visit Clientron at Booth K0427a, TWTC Nangang Exhibition Hall 1.

ASUSTOR Showcases High-performance Network Attached Storage and New Operating System ADM3.0 at COMPUTEX 2017

Sponsored content

Multiple research reports on the Network Attached Storage (NAS) market have indicated a similar trend that the NAS market will show continuing growth in the next five years driven by a wide range of uses by consumers, SOHO and enterprises. This is mainly because most users tend to prefer private cloud over free public cloud despite its popularity for data confidentiality and security considerations. As such, cost-effective and highly-integrated NAS remains in high demand.

To meet the expectations by different customer bases including enterprises, SOHO and home users toward premium quality NAS, ASUSTOR is fully committed to the R&D and integration of NAS software, firmware and hardware and thereby continues to introduce new NAS products with higher performance, more add values and better user experiences. At COMPUTEX 2017, ASUSTOR is presenting AS6302T and AS6404T powered by Intel Apollo Lake Celeron processors as well as AS7004T-i5 and AS7010T-i5, new additions to its 70 series. ASUSTOR is also debuting its latest ADM 3.0 operating system at COMPUTEX 2017.

High-performance new models support seamless playback of 4K video

Quote Lin, Chief Technology Officer, Technical Service Division, ASUSTOR pointed out AS6302T and AS6404T powered by processors of the latest Apollo Lake architecture not only provide exceptional overall performance but also more ideally support video output, such as smooth playback of H.265 4K video, compared to previous generation products. Furthermore, they are embedded with the new HDMI 2.0 interface to fully support 4K 60Hz standard, in addition to the popular USB Type-C interface.

It should be noted that the two NAS models lead the market by featuring the Wake-on-WAN function. Users can easily switch on their NAS through the Internet from the office, home and other places. This feature allows users to save energy consumption and also protects the system from random invasions, safeguarding security of private cloud.

ASUSTOR will also unveil its new AS7004T-i5 and AS7010T-i5 at COMPUTEX 2017. They feature quad-core Intel Core i5 processors which enable significant performance improvement over the previous generation models with Core i3 processors in terms of 4K video playback and transcoding, transmission of massive files and operations of virtual machines and Docker containers. In particular, AS7010T-i5 houses 10 hard drives and additionally supports a 10G network card expansion slot so it satisfies storage needs by media professionals dealing with massive multimedia files on a regular basis.

ASUSTOR additionally introduces expansion enclosures, each supporting four drives, for use with all ASUSTOR NAS to provide users with more flexibility and convenience in capacity scalability.

New OS ADM 3.0 provides network capabilities

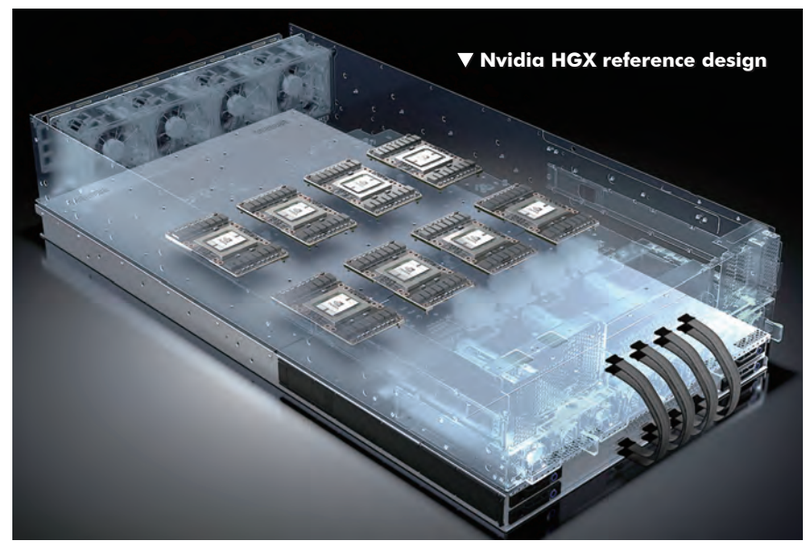
Lin further said the operating system ADM 3.0 with a whole new look and extraordinary simplicity will make a debut at COMPUTEX 2017. ADM 3.0 includes new highlights that enable the administrator to group desktop app programs together, create shortcuts to frequently-accessed folders or files by dragging and dropping them, and monitor system resources, storage space, online users and important logs through built-in widgets. More importantly, ADM 3.0 supports EZ-Connect, the Internet connectivity function, so users not familiar with network equipment setting know-how can quickly access their NAS via a peer-to-peer connection from an environment outside of the local LAN, bypassing complicated settings on the router, such as port forwarding.

ASUSTOR is also presenting the new Surveillance Center 2.7 beta version, a real-time cloud-based NAS video surveillance solution. It features full support of ADM 3.0's network connectivity and is added with professional surveillance capabilities, including scheduling camera power on/off, importing and exporting camera settings, exporting video recording files directly from the local terminal through HDMI interface, adding digital watermarks to video recording files and providing video forensic tools.

Allen Yen, Director, Sales & Marketing Division, ASUSTOR commented as a subsidiary of ASUSTeK, ASUSTOR can tap into abundant corporate resources to accelerate product promotion and leverage network equipment from ASUSTeK to deliver premium user experiences. Building its R&D on top of the corporation's N+1 core strategy, which aims to provide consumers N+1 return for the cost of N. This is also the thinking behind ASUSTOR's launch of NAS that unshackles itself from the traditional file server concept to provide a platform full of added values. For example, the first ASUSTOR NAS not only had basic storage and backup functions but also beat the industry to support HDMI and embed a media player, with multiple software tools being added to meet the requirements by power users. ASUSTOR is making these efforts for the purpose of creating more potential applications for users.

Lin added that looking into the future, ASUSTOR will hold onto its original design concept and keep developing additional software functions. Smart forward-looking applications including gateways for smart home applications, AI-based data analysis, sorting, and archiving, seamless integration with public cloud, automated and synchronized backup between cloud and local storage, and even tiered data management are all on ASUSTOR's roadmap.

Nvidia taps Taiwan server industry with HGX reference design for AI systems


▼ Nvidia HGX reference design

Michael McManus, DIGITIMES

On the first day of Computex Taipei 2017, Nvidia announced the launch of a partner program called the Nvidia HGX Partner Program with Taiwan's leading server makers, including Foxconn, Inventec, Quanta and Wistron, in a move targeting AI solutions for cloud computing.

Through the Nvidia HGX Partner Program, Nvidia is providing each ODM with early access to the Nvidia HGX reference architecture, Nvidia GPU computing technologies and design guidelines.

Using HGX as a starter "recipe,"ODM partners can work with Nvidia to more quickly design and bring to market a wide range of qualified GPU-accelerated systems for hyperscale data centers. Through the program, Nvidia engineers will work closely with ODMs to help minimize the amount of time from design win to production deployments.

The design is targeted to meet exploding demand for AI computing in the cloud, in fields such as autonomous driving, personalized healthcare, superhuman voice recognition, data and video analytics, and molecular simulations.

HGX is the same data center design used in Microsoft's Project Olympus initiative, Facebook's Big Basin systems and Nvidia DGX-1 AI supercomputers. While no price has been listed for the HGX, a price of US$129,000 was bandied about for the Nvidia DGX-1 when it was launched in 2016.

Early in May, Nvidia and Microsoft announced the new HGX-1 hyperscale GPU accelerator, which is an open-source design released in conjunction with Microsoft's Project Olympus. According to the two companies, HGX-1 will do for cloud-based AI workloads what ATX (Advanced Technology eXtended) did for PC motherboards. ATX established an industry standard that can be rapidly and efficiently embraced to help meet market demand.

The HGX-1 enclosure architecture is built around eight Nvidia Tesla GPUs interconnected with the NVLink hybrid cube that was introduced with the Nvidia DGX-1. The PCIe switching architecture enables a CPU to be dynamically connected to any number of GPUs. This allows cloud service providers that standardize with a single HGX-1 infrastructure to offer customers a range of CPU and GPU machine instances, while a standard NVLink fabric architecture allows the GPU software ecosystem to accelerate AI workloads. According to Nvidia, the solution provides up to 100X faster performance when compared with legacy CPU-based servers when it comes to deep learning and is estimated to be one-fifth the cost for AI training and one-tenth the cost for AI inferencing.

AI has been a booming business for cloud server providers and Nvidia has become a market leader in the area with its GPU solutions. At its most recent investor conference, Nvidia announced that its data center revenues totaled US$409 million, nearly triple the total achieved one year earlier. It also represented an increase of 38% from the previous quarter and marked the seventh consecutive quarter of sequential improvement for the company. Driving the growth was demand from cloud service providers and enterprises building training clusters for web services, as well as strong gains in high-performance computing, GRID graphics virtualization, and the company's DGX-1 AI super-computer.

However, Nvidia CEO Jen-Hsun Huang noted at the conference that it was AI that has quickly emerged as the single most powerful force in technology. All of the major Internet and cloud service providers use Nvidia Tesla-based GPU accelerators, he noted, while listing AWS, Facebook, Google, IBM, Microsoft, Alibaba, Baidu, and Tencent as customers. Huang added that Microsoft is also bringing Nvidia Tesla P100 and P40 GPUs to its Azure cloud.

Organizations are increasingly building out AI-enabled applications using training clusters, evident in part by growing demand for the DGX-1, according to Nvidia. Huang pointed out that Fujitsu had an installment of 24 systems integrated into an AI supercomputer for RIKEN, Japan's largest research center, and there were also new supercomputers at Oxford University, GE, and Audi. Nvidia also announced the launch of the Caffe2 deep learning framework with Facebook, as well as Big Basin servers with Tesla P100 GPUs.

As overall demand for AI computing resources has risen sharply over the past year, so has the market adoption and performance of Nvidia's GPU computing platform. Today, 10 of the world's top 10 hyperscale businesses are using Nvidia GPU accelerators in their data centers.

This year, Nvidia has also launched its new Volta architecture for its Tesla GPUs. Volta-based GPUs offer three times the performance of the predecessor. According to Ian Buck, general manager of Accelerated Computing at Nvidia, the technology is evolving rapidly and he noted that the tripling in deep learning performance in the Tesla GPUs is having a significant impact on the way systems are designed and offering new opportunities for ODMs.

Flexible, upgradable design

The standard HGX design architecture includes eight Nvidia Tesla GPU accelerators in the SXM2 form factor and connected in a cube mesh using Nvidia NVLink high-speed interconnects and optimized PCIe topologies. With a modular design, HGX enclosures are suited for deployment in existing data center racks across the globe, using hyperscale CPU nodes as needed.

Both Nvidia Tesla P100 and V100 GPU accelerators are compatible with HGX. This allows for immediate upgrades of all HGX-based products once V100 GPUs become available later this year.

Nvidia stated that it believes HGX to be an ideal reference architecture for cloud providers seeking to host the new Nvidia GPU Cloud platform. The Nvidia GPU Cloud platform manages a catalog of fully integrated and optimized deep learning framework containers, including Caffe2, Cognitive Toolkit, MXNet and TensorFlow.

As for Taiwan players, they expect AI to benefit the PC hardware supply chain. Commenting on AI applications, Inventec president Huang Kuo-chun recently noted that servers are only seeing flat shipment performance at the best in the traditional enterprise application market, but in the datacenter market, they are enjoying high shipment growth. Intel, AMD and Nvidia have all invested aggressively in related product lines, showing the potential of the AI market, Huang pointed out.

Although Google, Amazon, Facebook and Microsoft all have different operating directions, their combined overall revenue performances will not vary all that much. Huang is more interested in the development of the automotive market, where autonomous driving is the hot topic at the moment. But Huang noted that the market's development is not only about the establishment of private cloud platforms, but also investments in public cloud systems covering smart road and smart streetlight management.

Compal is a latecomer of the server industry, but has been eagerly looking to participate in AI development especially smart voice assistance.

Compal president Ray Chen is optimistic about smart voice devices' potential. He noted that such a device is an extension of AI technology and the way the device works also fits the trend of smart home development.

Compal reportedly has landed smart voice assistance products from Microsoft and Chen believes a major trend for the device's development is to feature an integrated display and camera.

Amazon recently launched its new Echo Show with integrated touchscreen display. In addition to Microsoft and Amazon, Apple also is looking to develop smart voice assistance products with Apple cooperating with Inventec using Siri as the foundation, while Microsoft's device will use Cortana. However, Inventec and Compal both declined to comment on their orders or clients.

Taiwan server industry

The server industry has been one of the few industries that has remained strong for Taiwan ODMs in recent years and increased opportunities in the AI field will help Taiwan makers.

Taiwan's server revenues increased 4.8% on year in 2016, reaching NT$555.8 billion because of increased server demand worldwide, while some vendors such as Quanta saw increased orders for cabinet/rack servers. However, the on-year growth was much weaker than that seen in the previous three years.

Revenues are generated from sales of server motherboards, servers, storage systems, switches and related network system equipment. So while Wistron will be the top server motherboard maker in 2017, the maker will be ranked fourth in terms of overall server-related revenues for the year.

In 2017, Taiwan-based vendors' server related revenues are expected to enjoy a 5.9% on-year increase to total NT$588.6 billion. Demand from datacenter clients including Amazon, Google, Facebook and Microsoft, is expected to rise further in 2017.

Inventec's revenues from server-related products exceeded those of Foxconn in 2016, helping Inventec become the largest server player in terms of revenues in Taiwan. However, Inventec only led by a small NT$1.7 billion margin.

Inventec's stable orders from Hewlett-Packard (HP), Dell and clients from the datacenter industry were the player's biggest advantage in surpassing Foxconn.

Quanta Computer and Inventec both achieved nearly 15% on-year growth in their 2016 revenues, increases that were higher than those from the rest of their competitors. Inventec will remain the largest players in 2017, while Quanta will be ranked third, but Quanta will narrow its gap with the second-largest player Foxconn.

The PIC16F15386 product family is the most powerful launching point into the 8-bit PIC® MCU portfolio. The scalable family offers up to 28 KB Flash and 2 KB RAM with high levels of Core Independent Peripheral (CIP) integration to perform system functions outside the core while consuming as little power as possible.

- Enabling application functions via CIPs
- Pin count ranging from 8–48 pins
  - Additional I/Os and ADC channels
- Memory access partition:
  - System flexibility
  - Configurable memory storage
- Device information area:
  - Unique ID and factory calibrations
- Low-power features and multiple communication interfaces
- Get started quickly with MPLAB® Xpress Series Development Boards
- MPLAB Xpress IDE including MPLAB Code Configurator (MCC)

Contact Information

Microchip Taiwan Sales Offices Email: rtc.taipei@microchip.com Technical Support: 0800-717-718

Phone: Hsinchu (03) 577-8366 • Kaohsiung (07) 213-7830 • Taipei (02) 2508-8600

www.microchip.com/PIC16F153XX

microchip DIRECT www.microchipdirect.com

MICROCHIP

The Microchip name and logo, the Microchip logo, MPLAB and PIC are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries. All other trademarks are the property of their registered owners. © 2017 Microchip Technology Inc. All rights reserved.