

**Operator**

Good day ladies and gentlemen, and welcome to the Q2 2017 Intel Corporation earnings conference call. As a reminder, this conference call is being recorded.

I would now like to introduce your host for today's conference, Mr. Mark Henninger, Head of Investor Relations. You may begin.

**Mark H. Henninger - Intel Corp.**

Thank you, Crystal, and welcome, everyone, to Intel's second quarter 2017 earnings conference call. By now you should have received a copy of our earnings release and the CFO earnings presentation, which replaces the CFO commentary that we've previously provided. If you've not received both documents, they're available on our investor website, [intc.com](http://intc.com). The CFO earnings presentation is also available via the webcast window for those joining us online.

I'm joined today by Brian Krzanich, our CEO and Bob Swan, our Chief Financial Officer. In a moment, we'll hear brief remarks from both of them, followed by Q&A.

Before we begin, let me remind everyone that today's discussion contains forward-looking statements based on the environment as we currently see it, and as such, does include risks and uncertainties. Please refer to our press release for more information on the specific risk factors that could cause actual results to differ materially.

A brief reminder that this quarter, we have provided both GAAP and non-GAAP financial measures. Today, we will be speaking to the non-GAAP financial measures when describing our consolidated results. The CFO earnings presentation and earnings release available on [intc.com](http://intc.com) include the full GAAP and non-GAAP reconciliations.

With that, let me hand it over to Brian.

**Brian M. Krzanich - Intel Corp.**

Thanks, Mark.

Q2 was an outstanding quarter in which we set a number of records. We beat the expectations we set in April, primarily as a result of stronger desktop and notebook microprocessor volume, and set a second quarter revenue record. We're executing well to our priorities, and after adjusting for the McAfee transaction, revenue grew 14% year over year while non-GAAP

operating margin grew 30%. Our data-centric businesses were up 16% year over year.

Technology and performance leadership are fueling our results. And in Q2, we extended our leadership with new breakthrough products in client computing, the data center and memory. With industry-leading products and strong first half results, we're on a clear path for another record year.

As we shared in February and reinforced in April, our strategy is to make Intel the driving force of the data revolution across technologies and industries. I outlined our top four priorities for the year in support of that strategy: growing the data center and adjacencies, ensuring a strong and healthy PC business, growing IoT and devices and executing flawlessly in memory and FPGAs.

I'd like to take a few minutes to highlight our progress in Q2. First, DCG. The Data Center business grew 9% in Q2 and remains on track to high single digit growth for the year. Strong public cloud growth continued, with revenue up 35%. Enterprise was down 11%, as workloads continued to migrate to the cloud and memory and solid-state drive constraints impacted server deployments. Comm service provider revenue was up 17%, while adjacencies, which serve all customer segments, rose 12%.

Cloud and comm service provider together are the growth engine in the data center, and together now make up nearly 60% of DCG's revenue. In 5G we're demonstrating end to end leadership in client and infrastructure. We have five ongoing trials with leading global service providers and 15 more in the pipeline. And we're on track with our development of IA, FPGA and ASIC silicon platforms based on new radio standards.

Earlier this month, we launched Xeon Scalable, formerly known as Skylake and with it, the industry's biggest platform advancement in a decade. Using Xeon Scalable, our customers have already achieved over 50 third-party verified performance world records and are seeing more than 1.6x performance increase over our prior generation product across a wide range of real world workloads.

For example, the new AVX-512 instructions double floating point performance, benefiting use cases like HPC, VR and AI. In fact, artificial intelligence inference throughput improves by 2.4x gen to gen. And when this silicon innovation is combined with our AI software frameworks optimizations, customers like Amazon Web Services are seeing inference performance improvements of more than 100x. The enthusiasm for Xeon Scalable resulted in our largest early ship program ever. We delivered more

than 500,000 units to over 30 customers who appreciate outright performance leadership.

The data center is central to our strategy and is a remarkable opportunity. By 2021 we expect the data center to be a \$65 billion silicon opportunity, and we're less than 40% of the total available segment today. As we build out the adjacencies like Ethernet, Silicon Photonics and 3D XPoint memory and pull them all together with rack scale design, we'll be positioned to deliver even higher levels of performance and efficiency to our customers and increase our percentage of the total TAM.

The Client Computing Group also delivered fantastic results. Revenue was up 12% over last year as product leadership combined with a disciplined segmentation strategy led to rising Core mix. We along with our customers and partners in the PC supply chain are driving the evolution of the PC experience, as users seek out high performance and new form factors. We launched the powerful new Intel Core X-series processor family including a new Core i9 Extreme Edition processor, extending our performance leadership. And we'll be shipping our first 10-nanometer products near the end of the year beginning with a lower volume SKU and followed by multiple SKUs and a volume ramp in the first half of 2018. We've seen some modest improvements in the PC consumption but we continue to expect a mid single digit TAM decline for the full year.

We also began shipping our next generation 4G LTE modem known as the 7480 to customers. As I mentioned earlier, we're continuing to make great progress with our wireless ecosystem, laying the groundwork for 5G, and starting in 2018, Intel will partner on what is expected to be the first 5G showcase at the Olympic games.

In our Internet of Things business, we're focused on four key verticals, retail, video, industrial and transportation. We saw strong growth across all four, leading to a 26% increase in revenue. We're specifically excited to see the ramp of our IVI designs with both Jaguar Land Rover and Toyota.

We're also about to mark a very important milestone in our transformation. We expect to close the acquisition of Mobileye in the third quarter, several months earlier than expected. Autonomous driving is a massive compute workload that will disrupt industries and save lives and we are investing to win in this important segment.

I'm excited to welcome the Mobileye team to Intel. Together, we expect to be the global leader in the \$70 billion autonomous driving systems, data and services market opportunity by accelerating auto industry innovation and delivering cloud to car solutions faster and at a lower cost. And we're looking

forward to talking with you in more detail about our plans and the progress we're making in this segment later this quarter.

Memory and FPGAs round out our priorities for the year. Our memory business grew 58% over last year, setting an all-time revenue record. A cornerstone for our strategy in this segment is differentiated technology. And that differentiation was on display earlier this month when we announced availability of the industry's first, and to date only, 64-layer 3D NAND SSDs. Our floating gate architecture already enabled industry-leading density at 32 layers. And we believe our density lead is even greater at 64. We also shipped more than 200,000 units of our revolutionary Optane memory for clients, which are available via our OEM partners and channel partners and have more than 50 data center customers testing Optane SSDs currently which will ship for revenue this year, Optane DIMMs remaining on track for availability next year.

Our memory factory, Fab 68, continues to exceed expectations, ramping ahead of schedule in terms of both output and yield. This will be a big part of our overall supply growth in the second half, which we expect to be greater than 20%. The combination of strong execution and favorable market conditions is accelerating our path to profitability. Core NAND returned to profitability this quarter ahead of our earlier estimate and we expect it to remain profitable for the balance of the year. We also now expect the entire NSG segment to be profitable for the full year of 2018 versus our prior end of 2018 target.

Lastly, our FPGA business was down 5% over last year on weaker data center and comms sectors, but remains on track to our mid single digit growth target for the full year, with broad reacceleration in the second half across markets, including the Data Center segment.

At their Build Conference in May, Microsoft disclosed a major advancement in the deployment of Intel FPGAs resulting in the industry's fastest public cloud network and new technology for acceleration of deep neural networks. Audi selected Intel for the Level 3 autonomous driving system in its upcoming A8 where our Cyclone V SoC FPGA technology will perform object and map fusion as well as parking pilot and sensor data pre-processing. We're also seeing strong adoption of our 14-nanometer Stratix 10 FPGAs. We continue to gain key design wins in our focus segments, and we're on track to production later this year.

To sum it up, I'm very pleased with our progress, and I'm more confident than ever in Intel's future and growth. Based on our strong first half and higher expectations for the PC business and the expected close of Mobileye,

we're raising our full-year revenue forecast from \$60 billion to \$61.3 billion and our non-GAAP EPS forecast from \$2.85 to \$3.00.

We continue to see intense competition across our businesses. That's the reality of the attractive markets in which we participate. The competition makes us stronger, and we're ready for it. We're executing well to our strategy to transform from a PC-centric company to a data-centric company that powers the cloud and billions of smart and connected devices.

The PC TAM is down more than 15% versus four years ago. Despite that headwind, our revenue is up more than 15% and our operating profit has grown more than 30%. More than 40% of our revenue now comes from our data-centric businesses outside the PC sector. And those businesses together are growing at double-digit rates. And while we're growing the top line, we're intensely focused on operating efficiency. We now expect spending as a percent of revenue to decline about 160 basis points versus last year, bringing it below 34%, on track to the 30% goal we're committed to, to hit by 2020.

And with that, I'd like to hand it over to Bob.

**Robert H. Swan - Intel Corp.**

Thanks, Brian, and good afternoon.

Like Brian said, we had an outstanding quarter and executed on several important milestones. Revenue was \$14.8 billion, up 14% year over year excluding the Intel Security Group. From an earnings perspective, operating income was \$4.2 billion, up 30% year over year, and EPS of \$0.72 was up 22% year over year. Our EPS performance was the result of strong top line growth, good gross margin improvement, and excellent spending leverage.

From a capital allocation perspective, we generated \$4.7 billion in cash flow from operations, returned \$2.6 billion to shareholders, and have capital in place to fund the Mobileye acquisition.

The planned acquisition of Mobileye, which will fuel our growth in the automotive segment, is expected to close in Q3, well ahead of our schedule.

At our Analyst Day in February, we talked about our strategy to transform from a PC-centric company to a data-centric company, a company well positioned to power the cloud and the billions of smart and connected devices. Our Q2 results demonstrate its continued momentum in our transformation, with the data-centric businesses, those outside of the PC segment, up 16% year over year. Our PC-centric business executed

extremely well in a declining market and was up 12%. Our data-centric businesses are more than 40% of the company's overall revenue.

Moving to earnings, we are seeing broad growth across the business, driving 4 points of operating margin leverage and 22% EPS growth year over year. Earnings growth is driven by strong top line growth for both the PC and data-centric businesses, improving unit costs with 14-nanometer ramp, and gains from a sale of a portion of our equity investment in ASML.

On our Q1 earnings call, Brian and I talked about our commitment to achieving spending target of approximately 30% of revenue no later than 2020. We made great progress in the second quarter, as total spending was down 330 basis points year over year. We've continued investments in our key priorities, including artificial intelligence, autonomous driving, and Moore's Law, while at the same time capturing benefits of our previously announced restructuring program and significant leverage from strong top line growth.

R&D spending was down 1 point, and our SG&A costs were down 2.2 points. On a full-year basis, we expect direct spending to be below 34%, approximately 0.5 point better than our prior guidance.

Let me touch briefly on our segment performance on slide 5. The Client Computing Group had another outstanding quarter. Revenue of \$8.2 billion was up 12% year over year. Client ASPs were up 8% year over year, as we continue to see strength in our gaming segment and strong Core mix.

We also continue to see the worldwide supply chain operate at healthy levels. This segment had another quarter of significant profit growth, with operating profit growing 58% from a year ago. And the business continues to execute and benefit from continued improvements in 14-nanometer unit costs, richer product mix, and lower spending.

Moving to slide 6, the Data Center Group had revenue of \$4.4 billion, up 9% year over year. The Data Center Group had operating profit of \$1.7 billion, down 6% year over year. As Brian mentioned earlier, we had strong growth in both the comms and cloud service provider segments, which are nearly 60% of our DCG revenue. Operating margin percent was impacted by increased technology development costs and higher artificial intelligence and adjacency spending. Versus the first quarter, our revenue accelerated 3% and our operating margin improved by 3 points. We are on track to our full-year guide of revenue growth in the high single digits and operating margin of over 40% for the full year.

The IoT, NSG, and PSG business segments are well positioned to capitalize on the explosion of data and are becoming a larger component of our overall

business, growing 28% year over year. Our Internet of Things business achieved revenue of \$720 million, growing 26% year over year, driven by strength in industrial and video and continued momentum in our automotive business. Operating profit was \$139 million, up 56% year over year on higher volume and ASPs offset by continued investment in automotive.

Our memory business had record revenue of \$874 million, up 58% year over year, with strong demand from data center SSD solutions and demand signals outpacing supply. This segment had an operating loss of \$110 million, largely driven by costs associated with 3D XPoint and start-up costs for our memory capacity. Our memory fab in Dalian continues to make great progress and is ramping several weeks ahead of schedule. Yields continue to improve and unit costs are well ahead of expectations.

The core NAND business returned to profitability in the second quarter, and we expect the core NAND business to be profitable for the full year and the memory business as a whole to be profitable in 2018, both ahead of our prior estimates.

The Programmable Solutions Group had revenue of \$440 million, down 5% year over year. Operating profit was \$97 million, flat year over year after acquisition-related impacts. We're making good progress in realizing cost synergies with the integration of this business.

Moving to slide 8, let me remind you of our capital allocation priorities and progress. Our priorities, first, invest in the business; second, strategic acquisitions; and third, return cash to our shareholders through dividends and buybacks. As I mentioned earlier, in the quarter, we generated \$4.7 billion of cash from operations. We purchased \$2.8 billion in capital assets, paid \$1.3 billion in dividends and repurchased about \$1.3 billion of stock.

In addition, we received cash of approximately \$900 million as a portion of our Intel Security divestiture. And we generated approximately \$1.3 billion from the sales of some of our interest in ASML, which generated \$796 million of pre-tax gains. At quarter end, cash and long-term investments was \$34 billion, up \$11 billion, and total debt was \$32 billion. Offshore cash investments and proceeds from the sale of our ASML investments are being used to fund the Mobileye acquisition.

Now, let me turn to guidance on slide 9. Some context. First, while we see slightly higher PC TAM and supply chain inventory replenishment contributing to higher expectations for annual revenue, we continue to take a more cautious view of PC consumption versus third-party analysts. Second, we continue to see strong demand signals in our memory business through the year, and we expect memory fab in Dalian to support higher

second half demand levels. And third, as I mentioned earlier, we expect to close the acquisition of Mobileye in the third quarter, and as such, are including expectations for this business into our guidance.

Based on these factors, we are raising our full year revenue guidance by \$1.3 billion to \$61.3 billion, operating income guidance by \$600 million to \$17.9 billion, and EPS guidance by \$0.15 to \$3 per share. The improvement in revenue outlook is driven by a strong first half, higher expectations of the PC business and the inclusion of Mobileye.

The improvement in operating margin is primarily driven by our increased revenue outlook. Our outlook for full year spending is \$20.7 billion as we expect modest increases related to revenue growth and the integration of Mobileye.

The increase in EPS is driven by higher expectations of revenue, coupled with gains on sale of our equity investments and the inclusion of Mobileye. We expect Mobileye to contribute approximately \$200 million of revenue, \$100 million of operating income, and \$0.02 of EPS in the second half of the year.

And on slide 11 (sic) [10], as we look to the third quarter of 2017, we are forecasting the midpoint of the revenue range at \$15.7 billion, up 3% year-over-year excluding Intel Security Group. And we expect operating income of \$4.8 billion and EPS to be approximately \$0.80.

2017 is shaping up to be another record year for Intel. We feel great about where we are six months into our three-year transformation. We exceeded our EPS expectations for Q2, and increased our profit expectations for the full year.

At the same time, we are investing to compete and win in an expanding market fueled by the growth of data. We are already seeing an impact from our data-centric oriented businesses, up double digits collectively, as we continue to transform the company from a PC-centric company to a company of smart and connected devices that power the cloud.

With that, let me turn it over to Mark.

**Mark H. Henninger - Intel Corp.**

All right, thank you, Brian and Bob. Moving on now to the Q&A. As is our normal practice, we would ask each participant to ask one question and a follow up, if you have one. Crystal, please go ahead and introduce our first questioner.



## **Question-and-Answer Session**

### **Operator**

Thank you. Our first question comes from Blayne Curtis from Barclays. Your line is open.

### **Blayne Curtis - Barclays Capital, Inc.**

Hey. Thanks for taking my question and nice results. I was curious on the data center business, maybe you can talk about the growth you they sequentially in the back half to get to that high single digits for the year. Maybe you can just talk about it by segment. I know cloud was up a lot in Q2, enterprise down. Talk about it by segment as well as the contribution from Scalable into those segments. What's the right timing to think about as those ramp in?

### **Brian M. Krzanich - Intel Corp.**

Sure. Thanks, Blayne, for the question. So I'll start and Bob can add some comments at the end. We think the data center continues to be just a great growth engine for the company. And you saw the 9% growth this quarter. What we have really been also focusing on at the same time is really increasing operating margin, and I want to make that point. You saw our operating margin increase to 38% this quarter. You'll see us continue to raise that operating margin so that we're back at the 40% plus operating margin for the back half and for the year.

So first wanted to lay that groundwork. What we've projected for the second half is quarters that are pretty much in line. We continue to expect enterprise to continue to decline. It declined a bit more in the second quarter than I think we had really projected. It declined at about 11%. But if you look at Q1, it declined a little less than we expected at 3%. But we still expect it to decline in those high single digit numbers. Cloud though, and grew greater than we what expected at 36%. We expect it to be in the mid 20s, probably more likely. And then networking and comms, 17% and the adjacencies at 12%.

So we expect that trend to continue. We don't need any big shifts in those trends to really get to that high single digit growth rate for the data center. We talked about Xeon Scalable. The initial reaction has been extremely positive. You see the largest number of prequalification samples sent out to customers. You see the cloud applications. We try to talk about it's the largest performance improvement in a decade, gen to gen. So we're seeing a very large ramp in the second half as we move on with the Xeon Scalable. And so I think that's what's going to fuel second half 2017, and then but it's

going to continue on into 2018 as well. So I think that's how we see the second half playing out.

**Blayne Curtis - Barclays Capital, Inc.**

Thanks, and then -

**Robert H. Swan - Intel Corp.**

The only thing I would add, Brian, is we came into the year looking at high single digit growth for the business and margins expanding quarter by quarter throughout the year, and two months in we see nice acceleration on both top and bottom line. And as we go into the second half of the year, we're comfortable with the full year outlook that we've given. And the only dynamic other than the things Brian highlighted is Q3 comps are a little tougher as we go into the second half of the year, but we feel good about the mix of the business as we go through 2017 and beyond.

Just to reiterate a point Brian said, with the strong cloud growth and the strong performance in the comms and networking space, we now generate 60% of our revenues from the higher growth aspects of the business. So we think that bears well for us in 2017 but also going into 2018 and beyond.

**Blayne Curtis - Barclays Capital, Inc.**

Thanks. And then I did want to ask you on the memory side, you looking for breakeven next year. What is driving that? Obviously, memory pricing has been strong, but I was just wondering if there's any other factors you're now adding into that outlook?

**Brian M. Krzanich - Intel Corp.**

Sure. So let's make sure we clarify, right, so on traditional NAND, we are breakeven this year. And we broke even actually this quarter, and we expect to remain there the rest of the year. When we talk about for next year, that's inclusive of 3D XPoint. And so the difference is really as we ramp products on through the XPoint and as we ramp out the rest of Fab 68, both of those. Whenever you're ramping a factory, because you have a certain amount of underutilization of the equipment just as you start to get it going, you tend to have slightly higher costs. And so that's what you see as the driver for the rest of the profitability growth as we go into next year.

I want to also say that the 64-tier NAND products gives us a cost and performance advantage just because they're leading edge products as well that is going to play into as we move through the remainder of this year and next year. So it's 64-tier products on traditional NAND, the ramp-out of Fab

68, and then the real startup and continuation in getting the rest of the products qualified on 3D XPoint is what gets us – everything profitable next year.

**Blayne Curtis - Barclays Capital, Inc.**

Thanks.

**Operator**

Thank you. Our next question comes from Ross Seymore from Deutsche Bank. Your line is open.

**Ross C. Seymore - Deutsche Bank Securities, Inc.**

Hi, thanks for letting me ask a question. Brian, I wanted to follow up the data center side that Blayne just asked about and get a little bit more color about the acceleration on the cloud side and the deceleration on the enterprise side. If you could give any more color on why you think those were at the extremes and why do you think they normalize going forward, it would be helpful.

**Brian M. Krzanich - Intel Corp.**

I don't want to say that they're going to "normalize". In fact, there's not going to be a major shift. The trend of – look, enterprise is going to continue to decline. We estimate, and again, this is just based on what we get from our customers, talking to the industry. It's going to be in the high single-digit decline. I think you'll see quarters like Q2 that was 11%. You'll see quarters like Q1 that were 3% or 4%. We've seen quarters higher than the 11% over the last couple years. So it's going to be lumpy as we see this shift, but the overall macro shift of enterprise to cloud or traditional on-prem systems to cloud is going to continue.

I think we'll also see, we still again, talking to our partners, thinking that mid-20% for cloud growth, but I think we'll see quarters like this quarter that was a little bit high. Other quarters we've had in the past have been more in line. So I don't think we're talking about something going normalizing. I'd say it's still going to stay relatively lumpy like this. But if you look at it over the long haul, even when you look at the first half of the year, 11% down this quarter, 3% down last quarter, you take a look at those on average and you get to that high single-digit number. So I still feel like that's going to be roughly about where it goes down, and then the cloud will continue to grow at that rate plus additional as more of the growth goes into the cloud.

**Robert H. Swan - Intel Corp.**

The only thing I'd add, Brian, is the supply/demand imbalance of SSDs in the quarter we believe had an impact on the enterprise sector. And as that supply/demand imbalance normals out, we think that will help. But all that being said, the trends Brian highlighted is still how we see the workloads playing out over time.

**Ross C. Seymore - Deutsche Bank Securities, Inc.**

That's very helpful. I guess for my follow-up if I can shift gears over to the margin side of things, and specifically the fall-through. It was great to see that you guys beat your OpEx guidance for the second quarter. As we think about the full year with revenues going up, why isn't gross margin changing at all? And then the OpEx increase ex-Mobileye, is that just the variable comp that comes in with bonuses et cetera, or is there something else in that roughly \$150 million increase to your spending line?

**Robert H. Swan - Intel Corp.**

Just on the second one first, the short answer is yes. The combination of the incremental growth and the addition of Mobileye are the primary drivers for the slightly higher spend.

Your initial comment on flow-through, to put it into context, from where we were in January, our full-year outlook, the revenue is up roughly \$1.8 billion. And with that \$1.8 billion, there will be roughly \$200 million of costs, primarily Mobileye. So in context, we feel like we're managing the cost and spending side of the business effectively as we position to a 30% spending of revenue by 2020 at the latest.

In terms of the gross margin dynamics, I think the trends that you've seen over the last couple quarters we expect to continue through the year. And it's really ASP improvements, good unit cost performance, volume leverage through the fab working in our favor. And on the flip side, the strong growth of the memory and the modem business and the ramp costs for 10-nanometer are partial offsets. Those dynamics are what has driven the strong gross margins in the 63% range in the first half, and we expect those same dynamics to play out in the second half as well.

**Ross C. Seymore - Deutsche Bank Securities, Inc.**

Great, thank you.

**Operator**

Thank you. Our next question comes from Vivek Arya from Bank of America. Your line is open.

**Vivek Arya - Bank of America Merrill Lynch**

Thank you for taking my question. Brian, for my first one, my question is on the competitive landscape in the data center. There's been a lot of discussion about AMD perhaps posing more competition than it has in the last several years. And I appreciate it's early days and you have a very strong product out, but are you hearing about them more in your customer conversations? Is that a more real threat than it has been in the past? Because they did have an event, they did show up with 10-plus potential customers. And in some of the benchmark data, they are showing some performance that is perhaps better at a lower price. So how real is that competition and how are you reacting to it?

**Brian M. Krzanich - Intel Corp.**

Sure, Vivek. I think in general, we see competition across almost every one of our platforms, whether it be in the data center or in the client business, and it's come from a variety of sources.

You're right, AMD has raised up a bit with their more recent products, but you see us responding. This is a traditional performance battle that we're very accustomed to, and we're comfortable in reacting and competing very aggressively in. And so you see us coming out with our Xeon Scalable. You'll see us make maneuvers like we accelerate our Core i9 products, which are all the way up to 18 thread systems on the client based products. So I'd tell you that yes, we're seeing increased competitive pressure from a variety of places. But that actually will just drive us even harder, make us better in the end. And we're comfortable that we can make the right products to deliver the right performance against those.

**Vivek Arya - Bank of America Merrill Lynch**

And as my follow-up, Brian, if you could give us a little bit more color on your 10-nanometer progress. What is the timing of products around that node? And as part of that, if Bob could remind us how the CapEx and depreciation and OpEx for that node are flowing through the financials. Thank you.

**Brian M. Krzanich - Intel Corp.**

Sure, so on 10-nanometers we are sampling, engineering samples to customers currently. The yields on 10-nanometers are continuing to improve pretty much right in line with the forecasted ramp rates. It's a new

technology, so you always have some problems to get solved but we're pretty comfortable with where we're at right now. Like we said in the earnings script, we are set to qualify the first production products right towards the end of the year. You'll see those start to ship in the first half of next year and you'll see a ramp of SKUs.

One of the things we're seeing is each one of these technologies, and actually products that we generate, we're generating quite a few more SKUs, Vivek. And so you'll see a variety of SKUs progressing through 2018 as we ramp the 10-nanometer products, starting with the, I'll call it, more simpler SKUs at the beginning, going all the way through the high performance, high complexity SKUs towards the middle and back half of the year. Which is it's a traditional ramp like you see us push out on a new product ramp.

**Robert H. Swan - Intel Corp.**

And then just in terms of the capital, yes, just as a reminder, our full year outlook for CapEx is roughly \$12 billion. We did indicate that approximately \$2.5 billion of that would be for memory. So underlying that, you have \$9.5 billion dollars CapEx for the logic business. For 10-nanometer and specifically you have TD lines and pilot lines going in this year and beginning to scale as we match the capacity with the production that scales in the first half and second half of next year. So that's reflected in the CapEx guide and the depreciation guide that we gave you earlier in the year and that hasn't really changed.

**Vivek Arya - Bank of America Merrill Lynch**

Thank you.

**Operator**

Thank you. Our next question comes from Stacy Rasgon from Bernstein Research. Your line is open.

**Stacy Aaron Rasgon - Sanford C. Bernstein & Co. LLC**

Hi, guys. Thanks for taking my questions. I had a question on the trajectory of data center growth into the second half. And to be honest, I'm still wondering why you don't think you can do better than high single digits. I mean I know you're calling out the tough comp in Q3 but it's only like 10%, right, which is roughly in line with full year guide and it's below the longer-term CAGR. So you're going to see comps at that level or higher kind of into perpetuity. I guess why call that out as an excuse? And what are the issues in terms of hoping and driving for a bigger lift in the second half versus what you're still currently guiding for with the Skylake-SP launch on its way?

**Brian M. Krzanich - Intel Corp.**

So I think, Stacy, first, we're quite proud of the growth rate we're seeing and especially the growth rates in the growth segments. We're forecasting mid 20s for the cloud business, the networking and storage business and adjacencies on down. What we're having to counter is not only the comps that Bob talked about, but the declining function of the enterprise, right. And so those two things counter those growth rates. Now, as the enterprise continues to shrink, it will become less and less moving forward. So we agree that over time, this will become a smaller and smaller impact to the growth rates. But right now, it's still a large enough percentage. It weighs on our ability to get the growth rate higher.

**Robert H. Swan - Intel Corp.**

Yes, and I would, if I sounded like I was giving an excuse, I maybe should just correct that. We feel great about where we are, first half up 7%, full year up high single digits, profit expanded during the course of the year and continuing to win in those segments of the market that have differentiated growth rates. So six months into the year, we feel good about where we are and we're excited about the new product that we launched.

**Stacy Aaron Rasgon - Sanford C. Bernstein & Co. LLC**

Got it. For my follow-up, on the PC side of things, I know you said that the channel's healthy, but it sounds like you also had channel fill in the quarter and it's also included in the guide going forward. So, I guess if the channel's healthy, why is there inventory filling up and what does that imply as we kind of get through the year and look into next year for the likely trajectory of your products' sales into that market?

**Robert H. Swan - Intel Corp.**

I think as we look at kind of the quarter performance – well, I should start with kind of the TAM overall, and Brian highlighted this in the prepared remarks. We have assumed that PC TAM will continue to decline in the mid single digits for the full year, and on the margin, that might be a little better today than it was six months ago. But we're not counting on a dramatic change in the PC TAM consumption for the year.

That being said, we've taken up our guidance quite a bit. So in that, there's a stronger Q2 performance with a little bit of more healthy inventory channels as we go into the second half of the year. So, if the inventory was maybe a little bit leaner over the last three to four quarters, I think we'd characterize them in the healthy level now. And we think the ecosystem is building for a second half that's consistent with our outlook for PC TAM.

**Stacy Aaron Rasgon - Sanford C. Bernstein & Co. LLC**

And it needs to build inventory to do that?

**Robert H. Swan - Intel Corp.**

Say it again.

**Stacy Aaron Rasgon - Sanford C. Bernstein & Co. LLC**

And it needs to build inventory to do that?

**Robert H. Swan - Intel Corp.**

I think the inventory levels, as we see it in the channel, is slightly higher than the lean levels they've been for the last couple quarters, but no dramatic difference from our perspective on how we see PC TAM for the full year.

**Stacy Aaron Rasgon - Sanford C. Bernstein & Co. LLC**

Thank you.

**Operator**

Thank you. Our next question comes from John Pitzer from Credit Suisse. Your line is open.

**John W. Pitzer - Credit Suisse Securities ([USA](#)) LLC**

Yes. Good afternoon, guys. Thanks for letting me ask the questions. Congratulations on the solid results. Brian, I apologize if I missed this in your prepared comments. My first question is just around pricing in DCG. It was down about 1% sequentially. There's always a lot of mix things there. You usually have some commentary about ASPs per bucket. Were they still strong? And I guess more importantly, as you think about the product launches in the back half of the year, at least some of our initial checks are suggesting that the customers are kind of chomping at the bit to buy higher up into the stack, which could drive some good ASPs. Can you talk about your expectations around ASPs and/or attach rates for adjacency data center businesses with the launch of the Xeon Scalable?

**Brian M. Krzanich - Intel Corp.**

Sure, John. So we expect the second half of 2017, from an ASP perspective, to be pretty much what you've seen in the past, where ASPs continue to increase on the various platforms of Xeon, right. So looking at each one,



you'll see ASPs overall increasing. What you're seeing on this is a little bit of mix, right, so as you saw, networking and storage grow at 17%, the adjacencies at 12%. Those are starting to become a little bit more a percentage of that business and those draw down the overall ASPs a little bit. But if you look within just the Xeon core function, those ASPs continue to increase at about the normal rates that you'd expect, especially as you move into a new architecture like Xeon Scalable.

**John W. Pitzer - Credit Suisse Securities ([USA](#)) LLC**

That's helpful. And then for my follow-on, just turning to the Client Compute Group, your ability to sort of segment that market and drive higher mix has been sort of a multiyear endeavor with a lot of success. What inning do you think you guys are in in that process, especially with AMD coming to market with new products? Is there still a mix, a potential story here, and what would drive that?

**Brian M. Krzanich - Intel Corp.**

I actually think there is. So I think if you take a look at this, John, what's driven this has not been clever segmentation necessarily. It's been the ability to segment into specific markets and specific performance. And so things like Core i9 are a good example where you're really targeting performance. And so what I believe is that what the growth areas in the client space, gaming, virtual reality, thin and light, they're requiring performance and power. And remember those are always somewhat tradeable as you take a look at this.

And so those trends are going to continue, and that's why that's as we talked about, how do you feel about competition, where do you see competition playing. We believe our leadership and performance will continue to allow that trend to continue and continue to allow the trend within CCG to continue as well. And that's part of what drove the forecast for the second half.

**John W. Pitzer - Credit Suisse Securities ([USA](#)) LLC**

Thank you.

**Operator**

Thank you. Our next question comes from Romit Shah from Nomura Securities. Your line is open.

**Romit Shah - Nomura Securities International**

Yes. Thanks so much for letting me ask a question. It looks like this is the fifth consecutive quarter that CCG beat expectations. Revenues were up 12%, and I think there's a debate out there as to whether or not you deserve credit for this performance with skeptics really pointing to sustainability more than anything else. And when you break down that 12% as you guys mentioned, ASPs are a big part of the increase. My question is, as you look at the mix in that business overall, is there room to drive ASPs higher and effectively capture more value inside of the PC TAM?

**Brian M. Krzanich - Intel Corp.**

So, yes is the simple answer, Romit. Remember this isn't necessarily us raising prices. So it's not we're out there going and saying okay, I'm going to charge \$10 more for the next Core i7. It's actually the percentage of units that are being bought at those higher units, and we continue to deliver higher performance at the same price with each one of these generations.

So what you're seeing is actually an overall trend that, yes, units are down. We talked about that, both I and Bob, around TAM being down somewhere in that low to mid-single-digit range. And that's pretty much in line with what I'm seeing third parties here. Some third parties are a little bit better than that. But for the most part, we're within a couple of percent.

But yes, we believe that there is room for continued demand, for movement upwards. So the number of Core i7s, the number of Core i9s, the number of people buying the performance thin and light laptops, those are going to continue. And you see it in our OEM partners and the type of systems they are producing and the type of systems they're bringing to market. Now they are targeting that more and more as well.

**Romit Shah - Nomura Securities International**

You guys...

**Robert H. Swan - Intel Corp.**

The only thing I would add is, again, we have a business that has a declining market. It's growing not by raising prices, but to Brian's point by a market that increasingly values performance. And the operating margins of the business for the first half of the year were up over 50%. So this team through its segmentation is executing extremely well.

And then as we mentioned earlier, with that great margin performance, we are redeploying our resources to invest in these data-centric set of businesses that have high growth characteristics that collectively were up 16% again in the quarter. And through this journey of a PC TAM decline, we

have a bigger business, a stronger business, and a more profitable business with an increasing portion, over 40%, coming from high-growth oriented businesses, so great performance in a declining market. Continuing to invest in it and reallocate across our portfolio, and feel good about the portfolio we have, and with the addition of Mobileye as we head into the second half of the year.

**Romit Shah - Nomura Securities International**

And in terms like, you obviously provide ASPs for CCG, but is the Core mix as a percentage of units a metric that we should be focusing on? And if I remember correctly, that percentage was close to 70%. I'm curious where it is today.

**Brian M. Krzanich - Intel Corp.**

It's continuing to climb. It is, but don't forget even within that Core mix, Romit, you have the ability to continue to scale up. So Core i3 versus Core i5 versus Core i7 and now we've introduced the Core i9, which is even higher performance.

**Romit Shah - Nomura Securities International**

Okay.

**Brian M. Krzanich - Intel Corp.**

So we saw early on people choosing Core over Pentium or Atom, for example, and you saw the Core mix move up. You're now seeing not only that continue to climb, but you're going to see within Core the amount of Core i7s, Core i9s, Core i5s continue to climb as well.

**Romit Shah - Nomura Securities International**

Got it.

**Brian M. Krzanich - Intel Corp.**

And that's why we continue to see that there are legs behind this. And you said are we getting credit for this, so we don't think when you look overall this business, last year's performance with great growth in all of the segments. You look at this year's performance so far in the first half and our projections now in the second half, we think that our ability to segment, to drive better operating margin, and to continue to drive performance into the PC and keep it more and more profitable while we invest and grow these other businesses, we think that there's an option around Intel that is quite good.

**Mark H. Henninger - Intel Corp.**

Thanks, Romit.

**Romit Shah - Nomura Securities International**

Got it, thank you.

**Mark H. Henninger - Intel Corp.**

And, operator, I think we have time for one more question.

**Operator**

Thank you. And our last question comes from Harlan Sur from JPMorgan. Your line is open.

**Harlan Sur - JPMorgan Securities LLC**

Thanks for taking my question and congratulations on the solid execution. In DCG, you guys are probably full throttle from a manufacturing perspective for Xeon Scalable or Skylake in the June quarter. But my question is how much of the data center growth in June was the initial production revenue shipments of Xeon Scalable to your customers, or did that contribute just very little to the June quarter mix?

**Brian M. Krzanich - Intel Corp.**

Okay. Yes, it's very little. We don't give out exact percentages by SKU like that. But I can genuinely tell you that it is really just the beginning of the ramp of the Xeon Scalable. And so its impact into Q2 was minimal at best. What you'll see is, as it ramps into the second half, it becomes a higher and higher percentage, and really the big volume is going to be 2018. So that's when it really takes over from the way the data center looks from a revenue and profit standpoint.

What we're excited about is we talked about the 500,000 units that are out there. That was the highest number of pre-samples. That shows you the demand by the big infrastructure guys around the performance. They were willing to take the product even before, quote, we were ready to start shipping it. And then the number of records we've broken already in performance, we talked about 50 records worldwide already. Those are laying the groundwork for how this ramp is going to look and feel as we move into the second half and into 2018.

**Harlan Sur - JPMorgan Securities LLC**

Great, thanks for the insights there. And good to see the profitability in the NAND segment. In enterprise SSD, I think you guys are still number two global market share leader there. And it looks like based on the first half performance, you guys are outpacing the market. So I guess the question is where is the team winning. Is it high capacity? Is it high performance for these enterprise and cloud drives? And similar to maybe some of your peers, is the team currently capacity constrained?

**Brian M. Krzanich - Intel Corp.**

Sure. So our whole strategy around the memory is that we are focused on differentiation and performance and specifically around supporting the data center. We do sell into client as well but that's not the main focus of this business. And so I'd tell you when we talk about our growth and when we talk about our projections for the rest of this year and why we're investing in the future, that 64-tier NAND gives us the ability to be a better cost but the high performance end. So we're not going after commodity SSDs that you're going to see even in high-end workstations necessarily. It's really focused towards the data center products.

Even still, there's not all SSDs and data centers are high-end performance. So we're comfortable with where we are in a market share. We want to balance those investments against the demand for these high performance areas and make sure we keep that in balance. And our real goal is then to move more and more of the business towards the 3D XPoint as we move into next year because that really differentiates us again as we really change the hierarchy between memory and storage as the data center DIMM memory systems come out.