Operator

Good day, ladies and gentlemen, and welcome to the Second Quarter 2019 Intel Corporation Earnings Conference Call. At this time, all participants are in a listen-only mode. Later, we will conduct a question-and-answer session and instructions will be given at that time. [Operator Instructions] As a reminder, today's program is being recorded.

And now I'd like to introduce your host for today's program Mark Henninger, Head of Investor Relations. Please go ahead, sir.

Mark Henninger

Thank you, operator. And welcome everyone to Intel's second quarter earnings conference call. By now you should have received a copy of our earnings release and the earnings presentation. If you've not received both documents, they're available on our investor website intc.com. The earnings presentation is also available in the webcast window for those joining us online.

I'm joined today by our CEO, Bob Swan; and our CFO, George Davis. 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 earnings presentation and earnings release available on intc.com include the full GAAP and non-GAAP reconciliations.

With that, let me hand it over to Bob.

Bob Swan

Thanks, Mark. The second quarter was significantly stronger than we forecasted in April and our results demonstrated our customer's preference to the performance of Intel XPUs as workloads grow, diversify, and become increasingly complex. That leads for performance manifested in strong mix in ASPs across the business. Our Q2 results are proof points for the megatrends that underpin our strategy. The world's insatiable appetite for data is driving demand for solutions to process, store and move it faster and better.

Customers want to work with partners, who can deliver performance and platforms to address their most important technology challenges. Our data-centric businesses overall performed roughly in line with our April expectations. Data center and IoTG customers chose our highest-performing products leading to strong mix in ASPs. While our cloud customers absorb capacity they put in place over the last year, we continue to expect cloud demand to improve in the second half.

Enterprise and government spending remains weak however, particularly in China. PC demand continued to improve particularly in the commercial segment. We now expect the PC TAM to be up slightly for the full year. Strong demand for our highest-performing products and the productivity and TCO gains they deliver continues.

Mix was stronger than we anticipated. While small core supply improved we were not able to fully satisfy customer demand for these SKUs in the second quarter. Tariffs and trade uncertainties created anxiety across our customers supply chain and drove a pull-in of client CPU orders into the second quarter. We also halted shipments to certain customers in response to the U.S. government's revised entity list. After a thorough review, we were able to resume shipments of some products in compliance with regulations and the net impact on the second quarter was limited.

While we hope and expect trade issues to be resolved, further tightening of export restrictions would come with revenue risk to our business. As a result, we entered the second half of the year a little more cautious than we were 90 days ago.

We met with many of you in May at our investor meeting, where we outlined three major thrusts of our game plan to transform our company and grow. First, we're pursuing the largest opportunity in our company's history a nearly $300 billion TAM comprised not just of CPUs for PCs and servers, but of XPUs and adjacent technologies for an incredibly wide range of workloads and devices. Second, we're strengthening our product leadership by accelerating the rate of innovation. And third, we're evolving our culture and improving our execution so that we can play an even greater role in our customer's growth and success.

I'll take a few minutes to share some of the progress we're making. I'll start with expanding our opportunity and expanding our TAM. Over the last few years, we have dramatically expanded our served market, while the PC market was declining. Our served market now is more than five times larger and growing faster and we have reallocated spending to expand our capabilities in higher growth areas.

We are evolving Intel Inside from a CPU inside a PC to XPUs inside everything that processes stores and moves data. Big bets in 5G, AI and autonomous systems are an important part of this transformation. In May, I outlined a disciplined framework for investing in and evaluating big bets as we expand into new markets. First, we'll invest where we have an opportunity to lead major technology inflection.

Second, our investments should allow us to play a larger role in our customers' success. And finally, they must show a clear path to profitability and attractive returns. Network infrastructure, which is transforming as the industry transitions to 5G, is one of our most important areas of investment and we are laser-focused on this opportunity. This business is growing at a 40% CAGR since 2014 from just over $1 billion in revenue to more than $4 billion last year.

The network cloudification that comes with 5G expands our opportunity in the core network and at the edge, as more data moves closer to where it is created. We expect to be in production on Snow Ridge, Intel's 10-nanometer system-on-chip technology for 5G base stations early next year. We've already announced that two large telecom equipment manufacturers have committed to this architecture and we're on track to 40% share in this market segments by 2022.

While the 5G network opportunity meets each of our investment criteria, the 5G smartphone opportunity does not. This is why we decided to exit the 5G smartphone modem business and conduct an analysis of our options for the remaining parts of that portfolio.

Today, we announced the sale of the majority of our 5G smartphone modem business to Apple. This deal preserves Intel's access to critical IP we have developed. It enables us to focus on the more profitable 5G network opportunity where we are growing and winning share. Another growth market we're gaining share is the Internet of Things. We are using our architecture accelerators and software assets, combined with unmatched scale and partners to develop one of the industry's fastest-growing IoT portfolios.

Taken together, the IoTG and Mobileye businesses grew at 22% over last year after adjusting for the sale of Wind River. More intelligence is moving to the edge and more industries want to harness the power of data to create business value innovate and grow. Devices and systems are becoming more autonomous. This is a trend IoTG is shaping and capitalizing on. Our team's work is producing outstanding results.

In the second quarter, we grew at roughly 3x the market rate and are positioned to significantly outgrow the market over time. Here again, we saw demand for performance and strength across all verticals we served with computer vision being an especially critical workload. Mobileye is positioned to lead another huge opportunity, autonomous driving. This business has grown at more than 30% CAGR since we acquired them in 2017.

Our market leadership continues to build momentum with 20 new design wins this year, representing 11 million lifetime units. Nissan's ProPILOT 2.0 and NIO's pilot vehicles have begun production featuring Mobileye base L2+ system for hands-free assisted driving technology. I visited the Mobileye team in Israel last month and was treated to an autonomous ride through the streets of Jerusalem. The progress we are making in Level four and Level five autonomy is extraordinary. Our mobility as a service JV with VW for deploying a commercial robotaxi service in Tel Aviv by 2022 is on track.

Global coverage of REM or Road Experience Management mobilized real-time crowdsourced mapping capability is expanding rapidly. Several major auto OEMs, most recently Ford, are adopting this breakthrough data-centric capability.

To understand the power of this data consider this; 1.5 million kilometers is sent to the cloud daily for BMW production vehicles. With the data collected from just the last four weeks, Mobileye was able to automatically map 94% of the German Autobahn and motorway network.

And the commercial opportunity for REM extends beyond real-time maps for vehicles. Since announcing the agreement earlier this year, Mobileye and Ordnance Survey have jointly launched a service that delivers high-precision road network location data to companies across multiple sectors.

Artificial intelligence is a $10 billion data center silicon opportunity by 2023. And today it's fueling cloud customer demand for solutions that accelerate demand in AI workloads. This is evidenced by the fact that key cloud customers, most recently Baidu, are collaborating on our Nervana Neural Network Processor for Training or NNP-T.

NNP-T will sample to customers later this year expanding our already diverse AI portfolio which spans multiple architectures including ASICs like NNPI, TPUs, GPUs, and FPGAs, all unified by single programming model, One API.

The second major element of our game plan is extending product leadership by accelerating the rate of innovation. The future of computing will require a solution-oriented mindset building on six pillars of innovation.

Over the last 50 years, Intel has delivered breakthrough-after-breakthrough in computing performance that has propelled technology and society forward. We are far from finished as our product and customer announcements over the last quarter demonstrate.

Our Data Center Group just announced a very important strategic partnership with SAP to optimize Intel's platforms including Xeon Scalable processors and Optane DC persistent memory for SAP's end-to-end enterprise software applications including SAP S/4HANA.

For over a decade, we have worked closely with SAP and developing differentiated breakthrough technologies that make organizations run more efficiently. The broadening of our strategic partnership with SAP will allow our mutual customers to accelerate the organization's digital transformation by deploying SAP business applications optimized for Intel-based infrastructure in the cloud, on-premises, and in hybrid environments.

Our ecosystem partners have already received Icelake server samples. We are making good progress on Icelake server and are now planning to start production wafers in the first half of 2020 with the volume ramp in the second half of the year. Both yield and defect density are ahead of schedule for our 10-nanometer data center products.

Cascade Lake, which is ramping now, is on track to be one of our fastest ramping products ever and we have a great solution for our customers in the first half of 2020 with Cooper Lake in the same platform as Icelake.

We are working more deeply with our customers to understand their needs and become the partner that they rely on to innovate and grow their businesses. They challenge us. It's producing results and it's making us better.

For example in the second quarter, we announced a strategic partnership with Google to collaborate on Anthos, a new reference design based on the second-generation Xeon Scalable processor and an optimized Kubernetes software stack that will deliver increased workload portability to customers who want to take advantage of hybrid cloud environments.

These deep customer engagements are frankly one of my favorite parts of the role. We are constantly thinking about how we can help our data center customers harness the potential of data by processing, storing, and moving it more efficiently. And a central part of the equation is interconnect technology, which is why we recently announced our intention to acquire Barefoot Networks. Barefoot Networks is an emerging leader in Ethernet switch silicon software with the programmability and flexibility necessary to meet the performance needs of the hyperscale cloud. We closed the transaction this week and we are excited to have the Barefoot team as part of the Intel family.

Our client computing customers can look forward to exciting new Intel products this year. In the second quarter, we launched a special edition of the world's best gaming processor the Core i9-9900KS. We also launched our new 10th Gen Core product family codenamed Ice Lake which integrates Wi-Fi 6, Gen11 graphics and AI acceleration. While we are delivering on the present we are also creating the future.

Intel Labs is researching completely new architectures like quantum and neuromorphic computing that promise incredible leaps in performance and power efficiency. Neuromorphic computing strives to emulate the neural structure and operation of the human brain, which could deliver big advancements in artificial intelligence by allowing computers to sense, learn and behave more naturally and efficiently.

Just this month, we announced an eight million neuron neuromorphic system comprising 64 Intel Loihi research chips that's now available to the broader research community. Finally, we are evolving our culture and improving execution because our customers are counting on us.

Our process technology road map continues to improve and we're making excellent progress on 10-nanometer. We began shipping Ice Lake clients in the second quarter supporting systems on the shelf for the holiday selling season and expect to ship Agilex, our first 10-nanometer FPGA later this year.

We now have two factories in full production on 10-nanometer. We are also on track to launch 7-nanometer in 2021. With a roughly 2x improvement in density over 10-nanometer, our 7-nanometer process, which will be comparable to competitors' 5-nanometer nodes, and will put us on pace with historical Moore's Law scaling.

We're also making steady progress increasing CPU supply. Through our investments, focused execution and tighter customer collaboration, we expect our PC CPU supply will be up mid single-digits this year, while we expect the PC TAM to grow slightly. We'll continue to work with our customers to meet their required product mix and ramp additional capacity to ensure we are not a constraint on their growth.

A final point of pride in the second quarter that speaks to Intel's values is the release of our annual Corporate Responsibility Report, which highlights the progress made over the last year toward our 2020 goals around environmental sustainability, supply chain responsibility, diversity and inclusion and social impact.

We achieved a number of our 2020 goals ahead of schedule: energy conservation, non-hazardous waste recycling, workforce diversity and technology empowerment. Being responsible stewards of the communities in which we operate is central to our culture and it is helping us transform and deliver the results you expect of us. I'm proud of what our team has accomplished over the last quarter and look forward to sharing more proof points of our progress with you in the coming months.

With that, I'll hand off to George, who will take you through the financial details.

George Davis

Thanks, Bob and good afternoon everyone. We had a solid Q2 with revenue coming in at $16.5 billion, down 3% year-on-year and higher by $900 million compared to our guide. Data-centric revenue was $7.7 billion, down 7%. And PC-centric revenue was $8.8 billion, up 1% year-on-year.

Our Q2 operating margin was 31%, down two points as client ASP strength was more than offset by platform volume declines and continued NAND pricing degradation. Q2 earnings per share came in at $1.06, up 2% year-on-year and $0.17 over our guide for the quarter. Year-to-date, we have generated $5.7 billion of free cash flow, returned $8.4 billion to shareholders, paid dividends of $2.8 billion, and repurchased approximately 117 million shares.

As mentioned last quarter, we anticipated a more challenging year in 2019 coming off a large build-out of capacity in 2018 by DCG customers as well as the pricing dynamics in memory, which is largely playing out as expected. In light of these factors I'm pleased with our results and operating performance for the quarter.

Non-GAAP EPS was up 2% year-over-year driven by strength in our platform ASPs, lower 10-nanometer startup costs, lower operating expenses, as well as lower shares outstanding and a McAfee dividend.

Offsetting factors were data centric demand softness, continued NAND pricing pressure and PC supply constraints, impacting our ability to fulfill low-end PC demand. Our non-GAAP tax rate came in at around 12% in line with last year.

Let's now turn to segment performance. Our Data Center Group ended the quarter with revenue at $5 billion, down 10% from the prior year and up 2% sequentially. This was slightly ahead of our expectations with platform ASPs, up 2% year-on-year.

Xeon ASPs were up double digits year-on-year on mix as our customers continue to select high-performance products. Against the tough year-over-year compare platform units were down 12%.

Cloud revenue was down 1% year-over-year as cloud service providers absorbed capacity after growing demand 40% in 2018. Enterprise and government revenue declined by 31% with particular weakness in China while communication service provider's revenue increased 3% year-over-year. We see comms service provider demand still in the early phase of a meaningful 5G-related build-out.

Overall, our other data-centric businesses were down 1% year-over-year or up 2% excluding Wind River on strength in our Internet of Things businesses, partially offset by ASP weakness in our memory business.

Our Internet of Things businesses, which include IOTG and Mobileye continue to show growth and delivered record revenue, up 22% excluding Wind River. IOTG showed strength across all segments with revenue growth of 23% year-over-year excluding Wind River and operating income growth of 21% on strong demand for higher-performance products in the quarter. We believe a portion of the revenue outperformance in IOTG is from tariff-related pull-ins.

Our Mobileye revenue and operating margin were up year-over-year 16% and 20%, respectively on continued ADAS penetration. Our memory business revenue was down 13% as the industry supply surplus continue to feed a deteriorating NAND pricing environment.

NSG operating income weakened by approximately $220 million year-over-year. PSG revenue declined 5% year-over-year as softness in cloud and enterprise demand more than offset growth in 5G wireless. Advanced products, which includes those manufactured on 28-nanometer through 14-nanometer process nodes grew 15% year-on-year. PSG operating margin was down 49% year-over-year on lower revenue, product mix and 10-nanometer road map investments.

The Client Computing Group demonstrated strong execution this quarter with revenue up 1% year-over-year on mix driven ASP strength, strong demand in commercial PCs and modems and $200 million to $300 million in revenue from order pull-ins due to trade and tariff concerns.

We believe the PC TAM grew slightly in Q2, led by our commercial PC demand. Our PC units were down 5% as our small core supply was constrained and we cannot fulfill all of our customer demand. We have made significant progress against our supply challenges and we expect supply and demand to return to balance in the second half.

That said, demand has been stronger than expected and product mix will continue to be a challenge in the third quarter as our teams work to align available supply with demand.

We saw strong ASPs in the quarter with notebook ASPs, up 3% year-over-year and desktop ASPs, up 5%. Operating margin for our client group was 42%, up five points year-on-year on strong revenue and mix and lower cost of sales post qualification of our 10-nanometer Icelake client product.

For the first two quarters, we generated $12.5 billion in operating cash flow. And we invested $6.9 billion in capital to ramp 10-nanometer capacity and for 7-nanometer product development.

We also spent $5.6 billion to repurchase 117 million shares to date. Buyback was accelerated in the second quarter, where our average purchase price was $46.78 per share. We have $11.7 billion remaining on our Board authorization.

Now let's talk about the full year outlook. For the full year, the market dynamics reflected in our April guide remain largely in place, although, memory has continued to weaken relative to our expectations.

Although we have seen a weaker first half in our data center business, we expect a better second half as demand from cloud and comms service providers, improves and our second Gen, Xeon Scalable continues to ramp.

We are increasing our revenue outlook for the full year by $500 million to $69.5 billion to reflect the out performance in the second quarter, somewhat offset by the effect of trade-related pull-ins and a weaker memory environment.

We continue to expect revenue from our data-centric businesses to be down low single digits for the full year.

Our guidance for full year PC-centric business growth, remains a low single-digit decline for the year, reflecting share loss in small core applications, where we have been short supply longer than expected and demand has remained healthy.

We expect to have additional small core forward supply in the second half which should allow us to regain some of that lost share. Operating margin for the year is expected to be 32% flat to our previous guide. Full year expectations for gross margin are unchanged at approximately 60%.

We expect Q3 gross margins to be roughly line with Q2, on strong flow-through of higher revenue offset by increased 10-nanometer cost as we ramp production. The cost increase in Q3 will be tempered, as we will be selling through some of the previously reserved 10-nanometer in the quarter. And we see the benefit of a grant related to our NAND factory in China.

We expect Q4 gross margin to be down 3 points to 3.5 points sequentially, as we continue to ramp 10-nanometer. And will have sold through the previously reserved inventory. And will also not see the benefits of the NAND grant.

We are making great progress on 10-nanometer. And expect to see continued yield improvement as we move into 2020. And work through the cost curve. Full year spending is expected to be down almost $1 billion year-on-year, in line with our prior outlook, adjusted for cost related to our acquisition of Barefoot Networks.

We are now expecting 2019 savings from our modem exit to rise to approximately $400 million to $500 million from our earlier estimates of $200 million to $300 million. The increased savings are being offset by higher spending on 10-nanometer and 7-nanometer processes and product R&D.

Earnings per share for the year, is now expected to be $4.40 up $0.05 from our April guide, reflecting higher Q2 earnings offset somewhat by the impact of tariff pull-ins on the second half, weaker memory and a slightly higher full year tax rate.

We now expect the non-GAAP tax rate for Q3 and Q4 to be approximately 13% up slightly from our April guide as we anticipate a higher mix of lower pre-tax income in the second half and higher tax demands.

Turning to Q3 outlook, we expect revenue of $18 billion up 9% sequentially, which is within our normal seasonal range after adjusting for trade-related pull-ins in Q2. Our data-centric and PC-centric businesses will be down mid-single digits year-over-year in Q3 against very challenging compares.

We expect Q3 operating margin of 35% and non-GAAP EPS of $1.24, on higher sequential revenue particularly in PC, data center and IoT.

I will conclude here. And turn the call back to Mark.

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All right. Thank you, George. Moving on now to the Q&A. [Operator Instructions] Operator, please go and introduce our first caller.

Question-and-Answer Session

Operator

Certainly, our first question comes from the line of Chris Danely from Citigroup. Your question please.

Chris Danely

Hey! Thanks guys. Just a question on share expectations, I know in the Analyst Day you expected the competitive environment to get a little more -- I guess a little more competitive, although it doesn't seem happening in Q2. And maybe you can talk about how you expect your share to trend over the next four to six quarters in light of the competitor coming out with 7-nanometer and then you guys introducing 10-nanometer later on. Do you think you'll maybe lose share over the next three to four quarters and then gain it back? Or how should we think about things are going to play out?

Bob Swan

Hey, Chris, it's Bob. First, I would say that during the course of this year as George mentioned in his prepared comments, we lost a little bit of share in the second quarter, particularly in CSG at the low and small core, primarily due to supply constraints. And our expectation is that we'll begin to work our way back in the second half of the year given the capacity we put in place to have more supply and meet our customers' demand. But stepping back and just looking at the macro environment over the next several years and particularly in the second half of the year on the data center side, what we've indicated is it will be a much more competitive environment.

Our intentions are with a -- not a 90% share position, but more like a 23% share position that we have significant prospects for growth across multiple aspects of our business. And our intentions are over the -- over that time frame to continue to grow our data-centric collection of businesses at or above market rates to grow. So that's consistent with what we said back in January. We reiterated it again at our May Investor Day and nothing's really changed from that standpoint. Thanks, Chris.

Operator

Thank you. Our next question comes from the line of Ross Seymore from Deutsche Bank. Your question please.

Ross Seymore

Okay. So a two-part question on the Data Center Group. I guess first and foremost, could you just discuss a little bit about the differences between the sub segments? The cloud side was impressively strong in the quarter and it sounds like you think it's going to continue. But the enterprise and government side, I know you said that was China specific, but that was exceedingly weak. Any more color on what's going on and that enterprise side in the current quarter and probably of equal if not greater importance the second half looks like you still expect a really big ramp and potentially better than seasonal. What gives you the confidence in the second half ramp in DCG?

Bob Swan

Yeah. Hey, Ross, it's Bob. I'll comment and then George will pile on. First on growth overall we had -- cloud I'd still put in the relatively soft category to the first half of the year as the cloud players continue to digest. And our expectations have been and still are that cloud will get a little bit stronger as we go into the second half. And as George mentioned, comms has been low single-digits as our customers begin to build up for the transition to 5G, so we expect that growth to probably materialize more as we go into the latter part of this year, but I think more in 2020.

Enterprise and government has been brutal through the first six months of the year. Q1 was really soft. Q2 was even softer. And while we don't like it, it's been pretty much in line with how we expected the first half and even the second half of the year to kind of play out. A couple of dynamics. You'll remember last year was really strong for enterprise and government. Growth was much stronger than we expected. Our belief at the time is that that was largely a function of increased digital transformation by CIOs, a favorable tax reform environment that gave them a little more capacity to spend. And we benefited from that tremendously last year.

So the first half of this year even the second half comps -- or comps are much tougher. And I would say our sense is that CIOs broadly speaking are a little more cautious as they go into the second half of the year. And then when you just take -- that's a broad-based comment. And then when you take China into account, China is even worse than that. So our thoughts to the first half of the year and even going into the second half of the year is the E&G environment won't get dramatically better. Cloud will get a little bit stronger and comms will get a little bit stronger in the context of our overall full year guide.

George Davis

Yes. I would just add that we -- again we saw enterprise and government down 31% year-over-year. I would say, maybe a little bit weaker than even we were forecasting which is for a pretty weak performance in that group. But in general, I wouldn't add any more to what Bob said.

Ross Seymore

Thanks a lot.

Operator

Thank you. Our next question comes from the line of Stacy Rasgon from Bernstein Research. Your question please.

Stacy Rasgon

Hi, guys. Thanks for taking my question. So we have gross margins coming down into Q4, you're probably in the low to mid-58%. And I know at the Analyst Day, you sort of gave an indication for gross margins in like the 2021 time frame to be around 57% on a $77 billion number. I guess how do I think about the trajectory from where we're exiting this year to the gross margin profile in 2021? Does that imply that 2020 gross margins should be down from obviously 2019, and 2021 should be down from 2020? And then what happens if you actually don't hit your revenue guidance of $77 billion in 2021, because the margins impact is mostly fixed? Does that imply margins come down even more in that case?

George Davis

I think -- hey, Stacy. It's George. We did say that we think we'll bottom out at 57% in 2021. We didn't guide specifically for 2020, but implied it would be closer to the 60% range. And I would say, one of the things that's going to help us -- two things that are probably going to help us as we think about 2019 to 2020. One is we're going to see more of the benefit of moving up the yield curve in 10-nanometer, which is pretty painful now and you're seeing that really in the fourth quarter gross margin. I would also say, though you're seeing a really pure impact of memory in the fourth quarter as well, because we have a grant in the third quarter. So, you're going to see a sequential step down just because of the absence of the grant, and it just tells you how much the impact on gross margin overall for the DC-centric group has been because of memory.

I think memory, if we can start to see improvement on that in 2020, and there's some evidence of firming of the ASPs, but probably too early to call that. I think that could also be a factor. But you're also seeing growth in our adjacent businesses, which have attractive margins. They'll continue to grow into 2020. And like I said, I think largely it's going to be 10-nanometer yield curve benefits, maybe a little bit improving memory and then improving adjacent businesses should be a little more positive than what we're seeing purely in Q4.

Operator

Thank you. Our next question comes from the line of Timothy Arcuri from UBS. Your question please.

Timothy Arcuri

Hi, thanks. I had a question for George. So George, I'm just trying to figure out the incremental accretion from the sale of the modem business. It doesn't seem like a lot of it’s dropping through to op margin, because you're investing more in 7 and 10-nanometer. So I'm just wondering why that would be the case if yields are on track. Thanks, George.

George Davis

Well, one of the things that we talked about Tim was trying to pull in as much as possible both the 10-nanometer and 7-nanometer road map, because we think the economics of that is more than worth the investment. And really the investments we're making now are all focused on executing for that. We're going to see more accretion from this deal coming in the following year when we would expect a significant increase in the reduction, and sort of the run rate OpEx for the piece that's going out at the end of the year. So maybe $400 million to $500 million this year, but you can probably double that number for next year, which we think will help on the total spending.

And the question is will we need to retain this higher level run rate that we're seeing today for acceleration fully into next year? I think there might be some opportunity there as well. But we're going to -- we're going to invest first in those things that we think drive yield improvement in 10 and product performance improvement in 10 and 7.

Operator

Thank You. Our next question comes from the line of Harlan Sur from JPMorgan. Your question please.

Harlan Sur

Good afternoon. Thanks for taking my question. Maybe just again to kind of step back from the data-centric businesses. On the revised full year outlook, you're still guiding data-centric to be down low single-digits year-over-year. Previously within data-centric you guys were looking for DCG specifically to be down mid-single digits year-over-year which implies about 20% growth in DCG second half versus first half. Is that still how the team sees DCG for the full year?

Bob Swan

I would say we're still roughly in that ballpark. We haven't really changed our view of the full year to maybe a little bit that slipped into the first half relative to our original second half expectations on the pull-ins even though it's more of an impact on the PC side that we saw a little bit of that in DCG. So now we're looking to a strong second half for DCG.

Harlan Sur

Great. Thank you.

Operator

Thank you. Our next question comes from the line of Vivek Arya from Bank of America Merrill Lynch. Your question please.

Vivek Arya

Thanks for taking my question. On inventory they were up about 12% sequentially in terms of dollars. And now when I look at your second half sales, you're forecasting them to grow 13% to 14% half over half so it kind of makes sense. But just inventory in terms of historical levels they're still quite elevated given the macro conditions. So is this all 10-nanometer-related inventory? Just what's driving this? How do you see it trending in the second half? And will there be any impact on the gross margins from any utilization changes that might be needed?

George Davis

Sure. Great question. And we're watching inventory very closely ourselves. The big bounce this quarter as you suspected was really about 10-nanometer within finished goods coming onto the balance sheet. And so there is actually some gross margin benefit which we began to see this quarter and we'll see a little bit next quarter previously reserved inventory then flowing into the marketplace so some gross margin benefit from that and you've seen that in the CCG margins.

We -- yes, normally we'll be up going into the seasonally strong third and fourth quarters in this quarter. I would say overall that we think the -- add this quarter which are all related to 10-nanometer make sense. I think we feel still that our inventory is higher than we would like in memory and we will look to bring that down over time. It's a very tough market to bring it down and then feel good about yourself. So we'll continue to watch that. But that's been part of the pressure on free cash flow has been some of these working capital particularly inventory impacts.

A – Bob Swan

To George's point the -- while we're not big fans of growing inventory we feel great about qualifying the Icelake product in the second quarter. And that qualification is the single biggest reason for the step function and inventory from Q1 to Q2. So we knew if we executed on our plans of the Icelake clients qualifications we'd have a step-function inventory and we feel good about getting that qualification done and behind us. The implications of that is the higher balance in Q2 versus Q1.

Operator

Thank you. Our next question comes from the line of John Pitzer from Credit Suisse. Your question please.

John Pitzer

Yeah, good afternoon, guys. Congratulations on the solid results. Maybe if I can go back to the gross margin from -- at the Q4 level, I'm just kind of curious given that CapEx has been running significantly ahead of depreciation I'm kind of curious if there's anything going on the depreciation schedule which is impacting the calendar fourth quarter gross margins.

And George to the extent in the previous question, you talked about maybe some tailwinds relative to the fourth quarter run rate next year in 2020 how do we think about the bridge from sort of the Q4 guide of kind of 58.5 to the Analyst Day guide for 2021 of 57. Is that all just the impact of 7-nanometer coming on in that year? Or is there some price consideration? How should we conceptually think about that?

George Davis

Okay, John. That's a great three-part question. There's nothing unusual going on in depreciation in the fourth quarter. As I said most of the impact is really related to -- we'll have gotten through all of the previously reserved 10-nanometer products. So you're going to see more pressure on gross margin from the products that are coming into the marketplace while we're still at the low end of the yield curve on 10-nanometer, which is where we are today.

In 2020, how I think about 2020, I think, we -- as I said earlier we think we'll see a benefit from moving up the yield curve on 10-nanometer. We're pleased with our process work that's going on there now. And also we would expect that memory which has been a significant drag on gross margin this year will help us a little bit overall. So, no real change. Probably the easiest thing would have just to go back and say no real change in our outlook that we gave at Analyst Day in terms of the gross margin trajectory over the next few years.

Bob Swan

Hey, George, the only thing I would add on the depreciation is, there's nothing kind of out of the norm. There are two fairly big dynamics that happened over the course of the next several months. One is over time we had more and more of our 14-nanometer equipment that's fully depreciated. So, as you know, that's been our engine for a while, and we'll have more and more fully depreciated assets that are at work. Now, that's obviously favorable.

On the flip side, we have -- we talked about ramping two fabs and we've had a lot of assets under construction on our balance sheet that weren't being depreciated. So, in one sense you have a drop-off from the life of 14-nanometer equipment. At the same time, you're deploying some of the 10-nanometer equipment that we bought previously.

So, those two things underneath the cover at the macro level to George's point, there's not a dramatic change. But underneath the cover is just two fairly big dynamics in the makeup of our equipment base and what's fully depreciated versus what's being put into service.

Operator

Thank you. Our next question comes from the line of Joe Moore from Morgan Stanley. Your question, please.

Joe Moore

Great. Thank you. You talked about the reasons for being a little more conservative about the second half than you felt 90 days ago, but your second half guidance isn't materially different than it was 90 days ago. So, I guess, how are you thinking that relative to the forecast?

And I guess when you talk about pull-ins like what is that -- I'm surprised that there is pull-ins at the same that there's shortages. So, maybe you can just describe what the behavior is that's pulling revenue into Q2.

George Davis

Yeah. So, again, for the second half -- really for the full year, we're largely seeing the full year as we talked about it 90 days ago.

What I think the biggest difference is just how strong PC demand has been and the pull-ins that came into the second quarter leading to a much stronger second quarter where we are passing obviously some of that through with the exception of the pull-ins to the full year.

So, I don't want to sound like we're going to -- we'll see the normal seasonal balance and will be a strong second half of the year for the company. And I think, we're expecting a strong DCG improvement in the second half as they get through the capacity digestion. We think the PC is going to continue to be quite strong. So, relative to our forecast, I guess, I may be countering a little bit this idea of a weaker second half. Other than memory has been a little bit weaker than we had expected. ASPs are certainly down more, and so we're anticipating some pain from that. And then, of course, some level of demand was pulled into the second quarter, but it's really reflective of the year that is playing out largely as we expected with some upside on PC TAM.

Bob Swan

Yeah. And I think the only thing that I would add to that is relative to where we were in April, looking out the second half of the year, we still have the threat of tariffs going up for goods coming out of China and the implication to that. And there's still a little bit of -- a little lack of clarity about the implications of the entity list and how quickly applications for licenses will be received and processed. So, I think that the real -- we're kind of $900 million better in the quarter. It took the year off for $500 million. We attributed roughly $400 million to pull-ins.

As we go into the second half, we're just the -- there's still a little bit unknown about what -- how this China thing is going to play out. And that's a big important market for us and that's probably what makes me a little more anxious.

Operator

Thank you. Our next question comes from the line of Matt Ramsay from Cowen. Your question, please.

Matt Ramsay

Yes. Good afternoon. Thank you. George and maybe Bob as well, we've heard and continue to hear rumblings of -- and you guys have addressed this at the Analyst Day and in other forums about how you might be price aggressive in certain sectors to try to protect market share. And I wonder if you might comment about how you're thinking about that strategically in your notebook business where you have 10-nanometer product coming online versus in your desktop business where you might be on 14-nanometer for a bit longer. Thank you.

Bob Swan

Yeah. First, I'd start with at the risk of repeating myself a TAM of $300 billion, the largest TAM in the company's history with a pretty decent wind at our back in terms of this insatiable appetite for data and what it means for the products that we build and design. So we view ourselves as having a relatively low-share position with significant opportunity to grow. But at the same time, we know it's just -- we're not the only ones that have seen a data-centric world. That will be a more intensely competitive environment. And our expectations over time are to protect our market share position, while continuing to invest in new prospects for growth. And that hasn't really changed.

When you look at that by segment, we're going to be -- on the PC side, we've been protecting our position for the last couple of years. I'd say the competitive intensity on the PC side started probably in the first part of 2017. And during that time frame, we've either protect our position, while moving end customers up to higher performance products that generate higher ASPs and with that have the capacity also to fight back and meet comps in targeted areas, where we need to.

So, that's how we think about this big opportunity to grow large market, protect our position while expanding into new vectors, and that transforms all segments and we're a little more protective about some segments versus others in those cases particularly when we're in a supply-constrained environment. So, not a whole lot has really changed on that other than we know it's going to be more competitive, and we try to take that into account as we thought about not only our second half outlook, but our three-year outlook.

Mark Henninger

Thanks, Matt. And operator, I think we have time for just one more question and then we'll turn the call back over to Bob to wrap things up.

Operator

Certainly. Our final question then comes from the line of David Wong from Instinet. Your question, please.

David Wong

Thanks very much. Just a clarification of what you had said with regard to restrictions in shipments to various entities in China. Can you say that the net result was actually small in the second quarter? And will there be -- do you expect any meaningful impact on DCG revenues from restrictions and shipments in the third quarter? Or is that going to be small too?

George Davis

Again, it was more in the second quarter. In fact, it was probably a net positive, because of pull-in activities. So if you look at what we were prohibited from shipping versus what was pulled in on things we're allowed to ship, where people were concerned that perhaps restrictions would become greater that was a net positive in the second quarter.

We think that dynamic just remains in play in the second half of the year. How much of the demand concerns were met in the second quarter, we'll have to see how that plays out, but our forecast is based on kind of the current state of activity. And as Bob said, we're -- it doesn't mean that we're not concerned or cautious about what could happen if there's a change in policy between now and the end of the year.

Mark Henninger

Thanks David. And we'll hand the call back over to Bob to wrap things up.

Bob Swan

Thanks, Mark, and Thanks everybody for joining us. I'd just kind of close where I started. We had a -- the quarter played out much stronger than we expected. Revenue better, gross margin's better, spending in line, earning's greater. And therefore from that confidence, we're raising our full year outlook and kind of feel good about our performance six months through the year.

Secondly, and just more importantly, we continue to really work the supply chain, so we're never in a position to constrain our customers' growth. We've made good progress through the first half. But I think more as we go into the second half, we're just in a better position than we've been in a while. We still have work to do. We're still working with our customers, but we feel pretty good on the supply as we enter the second half.

And then third, our progress on both 10-nanometer and our confidence in migrating from 10 to seven continues to grow based on execution. So, we kind of gave you a three-year outlook. We consider this the second deposit of that 12 deposit three-year outlook and I'd say we feel pretty good about where we are. And we look forward to giving you another update 90 days from now about continued progress and momentum on our multiyear journey.

So, thanks for joining us and we look forward to talking to you again in 90 days.

Mark Henninger

Thanks, Bob, and thank you all for joining us today. Operator, can you please go ahead and wrap up the call?