

Company Name: Intel  
 Company Ticker: INTC US  
 Date: 2017-10-26  
 Event Description: Q3 2017 Earnings Call

Market Cap: 218,602.80  
 Current PX: 46.71  
 YTD Change(\$): +10.44  
 YTD Change(%): +28.784

Bloomberg Estimates - EPS  
 Current Quarter: 0.865  
 Current Year: 3.255  
 Bloomberg Estimates - Sales  
 Current Quarter: 16336.576  
 Current Year: 62043.886

## Q3 2017 Earnings Call

### Company Participants

- Mark H. Henninger
- Brian M. Krzanich
- Robert H. Swan

### Other Participants

- Ross C. Seymore
- Stacy Aaron Rasgon
- Blayne Curtis
- John William Pitzer
- Romit Jitendra Shah
- Harlan Sur
- Matthew D. Ramsay

## MANAGEMENT DISCUSSION SECTION

### Mark H. Henninger

#### *GAAP and Non-GAAP Financial Measures*

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 commentary and earnings release, available on [intc.com](http://intc.com), include the full GAAP and non-GAAP reconciliations

### Brian M. Krzanich

#### *Business Highlights*

##### *Revenue and Operating Income*

- Q3 exceeded our expectations with revenue \$16.1B, which is \$400mm better than our outlook
- Operating income of \$5.6B was more than \$700mm better than our outlook
- Our data-centric businesses grew 15% y-over-y, reaching 45% of our revenue, proving that Intel is becoming a data-centric company
- The fiscal discipline that Bob and I have talked about is delivering results even faster than we had forecasted while simultaneously allowing us to focus more on innovation in our key growth segments

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### ***McAfee Transaction***

- Revenue grew 2% or 6% after adjusting for the McAfee transaction
- Operating income grew 8% and EPS grew 26%, both reaching all-time records
- Add it all together, and this was a remarkable quarter in what is shaping up to be a remarkable year

### ***Strategy***

- Our strategy is to be the driving force of the data revolution across technologies and industries
- Our data-centric businesses are the company's growth engine
- Individually, these businesses provide great value to our customers
- Collectively, they're solving our customers' problems in a way that no individual business or product could
  - We've built a collection of capabilities that is unmatched
- At the same time, our PC business remains central to our success
- It's a source of great profit, cash flow, scale, and intellectual property

### ***Data-Centric and PC-Centric Business***

- We've made great progress in both our data-centric and PC-centric businesses over the last few months, and I'll share a few important milestones that illustrate that progress
- We're going to start with CCG [Client Computing Group], which produced exceptional results despite a declining PC TAM.
- PC market conditions continued to improve, and we achieved record Core i5 plus Core i7 client mix
- Our focus on an annual beat rate of innovation and thoughtful segmentation combined with an investment strategy designed to produce results, even in a declining market, is paying off

### ***Coffee Lake***

- We're especially excited about the launch of our latest 8th Generation Core processor, code named Coffee Lake
- The Coffee Lake family includes our first six-core desktop CPU
- And it's our best gaming processor to date, with up to 50% better performance than the competition on top game titles
- We're on track to ship our first low-volume 10-nanometer part by the end of the year
  - That will be followed by the initial ramp in H1 2018, with both high volume and system availability in H2 2018
- We shipped our first modem into the auto industry, and our modem revenue was up 37% in total over last year

### ***Data-Centric Business***

- Moving on to our data-centric businesses, DCG [Data Center Group] revenue grew 7% in Q3 and remains on track for high single-digit growth for the year

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- We saw strong cloud growth, outgrew the comm service provider end market and, while the enterprise decline moderated sequentially, we still see workloads moving to the cloud
- Cloud and comm service provider revenue combined is nearly 60% of DCG revenue now
- In less than three months, we've had more than 200 Xeon scalable OEM systems begin production shipments, and our customers across all of our segments are beginning deployments that will continue to ramp in Q4 and through 2018

### ***Internet of Things Business***

- In our Internet of Things business, revenue was up 23%, with strength across the retail, industrial, and video segments
- We also continue to build momentum in the vehicle infotainment market, winning designs from our competitors at leading automakers

### ***Mobileye Transaction***

- Early in the quarter, we closed the Mobileye transaction a full four months ahead of schedule
- So far this year, Mobileye has won 14 ADAS [Advanced Driver Assistance Systems] designs across 14 automakers, a pace well ahead of the 12 wins they recorded all of last year
  - These designs provide for typical features like automated emergency braking, lane keeping, and adaptive cruise control
- But several also include next-step functionality like highway autonomous driving
- We're also winning marquee designs for Level 3 and higher levels of autonomy, including our strategic partnership with BMW and Fiat Chrysler

### ***Waymo***

- Most recently, we announced that Waymo's newest vehicles, the self-driving Chrysler Pacifica Hybrid minivans, feature Intel-based technologies for sensor processing, general compute, and connectivity
- With 3mm miles of real-world driving, Waymo cars with Intel technology inside have already processed more self-driving car miles than any other autonomous fleet on the U.S. roads

### ***Intel and Mobileye***

- Intel and Mobileye provide the auto industry with unmatched product breadth, the architectural flexibility to support open and closed implementations, and technology leadership
- Our progress in just a few short months illustrates the benefits of our combination
- And together, we can deliver the promise of autonomous driving in a safer, collision-free future

### ***Memory and FPGAs***

- Let's move on now to memory and FPGAs

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- Our memory business grew 37% over last year and operating margin improved significantly, as Fab 68, our Dalian factory, continued to beat both its ramp rate and yield goal
- Fab 68 accounted for more than half of our supply in a quarter where more than 70% of the total bits were 3D NAND

### ***Memory Innovation and Technology Leadership***

- Our memory innovation and technology leadership is having an impact
- We shipped the industry's first 64-layer data center SSDs and have a strong Optane design win pipeline
  - That leadership technology has also resulted in strong customer interest in long-term supply agreements, and we've already signed two such agreements
- Bob will share more about our approach, but this is an important step that will mitigate the short-term cash flow impact of ramping our memory capacity

### ***FPGA Business***

- And finally, in our FPGA business, revenue was up 10% over last year, with growth in the data center, embedded, and automotive segments, where we're ramping designs like the Level 3 autonomous 2018 Audi A8 and DENSO's stereo vision system
- Strength in these segments was partially offset by continued weakness in comms infrastructure
- Our design win revenue value was up more than 10% in Q3, the highest level in more than three years
  - This business is central to our success in artificial intelligence

### ***Project Brainwave***

- In Q3, Microsoft announced that it would use our 14-nanometer Stratix 10 FPGAs for its accelerated deep learning platform that's code named Project Brainwave
- And as part of a broadening engagement between our companies, Alibaba is using Intel FPGAs to power the acceleration of the service of Alibaba Cloud
- We've made tremendous progress in AI and advanced computing technologies over the last few months
- In addition to our FPGAs and autonomous driving wins, we launched the Movidius Myriad X, the world's first vision processing unit with a dedicated neural compute engine to deliver artificial intelligence capabilities to the edge in a low-power, high-performance package

### ***QuTech***

- We also achieved new research milestones, as Intel scientists pursue exciting emerging forms of compute
- We delivered a 17-qubit superconducting test chip for quantum computing to our research partner, QuTech
- And we'll follow that up with a 49-qubit test chip by the end of the year
  - We also unveiled the Loihi, a self-learning test chip that mimics the brain's basic mechanics and makes machine learning faster and more efficient

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- Later this quarter, we'll ship the Nervana neural network processor, the industry's first commercially available processor of its kind
- I also announced last week that Facebook is working in close collaboration with us, sharing their technical insights as we bring this new generation of AI hardware to market

### ***AI Inference***

- Together, these accomplishments reinforce several things for me
  - First, Intel is the leader in AI inference from the core of the data center to autonomous vehicles out to the edge devices where low power is especially critical
  - Second, artificial intelligence takes many forms and will require computing solutions that are tailored for the workload, the environment, and the user, rather than a one-size-fits-all
  - And third, our investments and pipeline of innovation position us to lead for years to come
- We had a quarter any CEO would be proud of
- And I'd like to take a moment to remember our former CEO and my friend, Paul Otellini
- Paul had an enormous impact on the industry and this company, and his Intel family will miss him
  - He would be proud of our growing momentum, and it's an important part of his legacy

### ***Market Segment Share***

- Wrapping things up, I'm excited about both our progress and our prospects
- And we're competing aggressively for our \$260B TAM, the largest opportunity in our history, with lots of room to grow market segment share
- In some of our segments, we're facing new or resurgent competitors
- In other segments, we are the new competitor
- But in all cases, competition brings out the very best in our company, as our third quarter results demonstrate

### ***Revenue***

- We're now well ahead of our commitments we made to you in January
- Our transformation is accelerating
- And we're raising our full-year expectations for revenue by \$700mm and for operating profit by \$900mm, our third consecutive increase this year
  - This puts us solidly on track to deliver the best year in the company's history for the second year in a row

## **Robert H. Swan**

### ***Financial Highlights***

#### ***Revenue and Operating Income***

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- This was an excellent quarter for Intel. vs. the expectations we set out at the beginning of the quarter, our revenue is better, our gross margins were stronger, and our spending was lower
- As Brian said, we're on track for another record in 2017
- Revenue in the quarter was \$16.1B, up 6% y-over-y excluding McAfee, and we achieved record earnings
- Operating income was \$5.6B, up 8% y-over-y, and EPS was \$1.01, up 26% y-over-y

### ***Capital Allocation Perspective***

- From a capital allocation perspective, we closed the Mobileye transaction and funded a significant portion of the purchase price through the sale of non-core assets, including reducing our position in ASML and proceeds from the partial exit of McAfee
- Additionally, we signed long-term NAND supply agreements, providing more than \$2B in prepayments through 2018, significantly improving FCF for our memory business
  - We generated \$6.3B in cash flow from operations, and we returned \$2.4B to shareholders

### ***Strategy***

- At our Analyst Day in February, we talked about our strategy to transform from a PC-centric company to a data-centric company
- Our Q3 results demonstrated continued momentum in our transformation
- Intel's data-centric businesses, those outside of the PC segment, grew 15% y-over-y and now represent 45% of our revenue, up from approximately 30% in 2012
  - This collection of businesses is well positioned to capitalize on industry trends, create great value for our customers, and represents the company's growth engine going forward

### ***PC-Centric Business***

- Our PC-centric businesses generated flat revenue in the quarter and improved operating margin by over 3 points
- The CCG team continues to execute extremely well in a declining PC TAM environment
- Our focus on performance-leading products and a smart segmentation strategy is working
  - This business provides scale, funds IP, and generates a significant portion of the company's profits and cash flows

### ***Earnings***

- Moving to earnings, we generated significant EPS expansion in the quarter, up 26% year on year
- Our EPS improvement was driven by solid platform execution, strong growth from our adjacent products and businesses, and lower spending, resulting in \$408mm growth in operating income
  - Additionally, we continued to monetize some of our ICAP [Intel Channel Alliance Program] portfolio positions, resulting in a gain of \$0.13 per share

### ***Investments***



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- We made a commitment at the beginning of the year to reduce spending to 30% of revenue by 2020 at the latest while continuing to invest in key growth areas and capabilities
- We are making great progress
- Total spending was down 6% y-over-y in Q3, with continued investments in our key priorities, including driving Moore's Law forward, artificial intelligence, and autonomous driving

### ***R&D Spending***

- At the same time, we're executing with operational discipline and generating significant leverage from higher revenue growth
- Our R&D spending as a percent of revenue was flat and our SG&A costs were down 3 points as we rationalize our marketing and sales programs and generate significant leverage in our G&A functions

### ***Co-Marketing Program***

- In addition, we've made changes to our co-marketing programs to provide more flexibility and efficiency to our customers
- These changes resulted in a reduction in revenue of approximately \$200mm during the quarter, reducing y-over-y growth in CCG by approximately 2 points and DCG by just over 0.5 point, with a corresponding reduction in spending
  - These changes collectively have no impact on operating income
- The impact of these changes will continue into Q4 at a slightly increased level
- On a full-year basis, we expect direct spending to be approximately 33%, one point better than our prior guidance and down over two full points from last year

### ***Client Computing Group***

- Let me touch briefly on our segment performance on slide 5
- The Client Computing Group had another outstanding quarter
- Revenue of \$8.9B was flat y-over-y, and operating margins grew by 3 points
- Flat revenue was driven by client ASPs up 7%, unit volume down 7%, and our adjacency business up 15%, partially offset by the changes to our co-marketing programs
- We saw typical Q3 inventory build ahead of the holiday season, and we believe the worldwide PC supply chain is operating at healthy levels
- This segment had another quarter of significant profit growth, with operating income growing 8% from strong Core mix, continued improvement in 14-nanometer unit costs, and lower spending

### ***Data Center Group***

- The Data Center Group had revenue of \$4.9B, up 7% y-over-y, and operating income of \$2.3B grew 7%
- Q3 operating margin was 46%

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- 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
- Overall unit volume was up 4%, ASPs were up 2%, and adjacencies grew 16%
- We launched Purley in Q3, and in less than three months we've had more than 200 OEM systems begin production shipments
- Revenue scale from leadership products and spending leverage and efficiency drove strong operating income growth for the business
  - We expect DCG to meet our full-year expectations of high single-digit growth and operating margin percent in the low 40%

### ***IoT, NSG, and PSG Business***

- The IoT, NSG, and PSG business segments are becoming a larger component of our overall business, growing 25% y-over-y
- Our Internet of Things business achieved record revenue of \$849mm, up 23% y-over-y, driven by strength in industrial and video and continued momentum in our retail business
- Operating profit was \$146mm, down 24% y-over-y, from continued investments in the automotive segment

### ***Mobileye Transaction***

- We closed the Mobileye transaction in early August, four months sooner than we expected
- The Mobileye team executed extremely well in Q3 and exceeded our expectations, with \$82mm in revenue and \$39mm in operating income
- Going forward, results for the Mobileye acquisition will be included in our All Other segment
- Increases in spending in this segment will correspond with reductions in the IoTG segment as we realize cost synergies from this acquisition

### ***Memory Business***

- Our memory business had record revenue of \$891mm, up 37% y-over-y, with strong demand from data center SSD solutions and demand signals outpacing supply
- This segment had an operating loss of \$52mm, an improvement of \$82mm vs. last year
- Our memory fab in Dalian continues to make great progress
- Yields continue to improve, and unit costs are well ahead of expectations
- The core NAND business continues to be profitable, and we expect the memory business as a whole to be profitable in 2018, both ahead of our prior estimates

### ***Programmable Solutions GROUP***

- The Programmable Solutions Group had revenue of \$469mm, up 10% y-over-y, driven by strength in advanced products, data center, automotive, and military
- Operating profit was \$113mm, up 45% y-over-y



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- We're making good progress in realizing cost synergies with the integration of this business

### ***Cash Balance***

- Moving to slide 8, our cash position of \$17.5B at September 30 is basically unchanged from the beginning of the year, but we've had lots of moving pieces during the year
- First, we have generated \$7.2B in FCF YTD, and we've returned \$7.4B to shareholders through the form of dividends of \$3.8B and share repurchases of \$3.6B, including \$1.3B and \$1.1B respectively in the quarter

### ***McAfee***

- Second, as we mentioned earlier, we closed Mobileye in Q3 for \$14.5B in cash and funded over 50% of the purchase price from the sale of non-core assets during the year, including McAfee and the sale of ASML shares
- Earlier in the year, we received \$924mm from the sale of 51% stake in McAfee
- And in the quarter, McAfee repaid the promissory notes of \$2.2B and issued a dividend of \$735mm

### ***FCF***

- Third, we expect to generate \$1.5B to \$2B more FCF vs. where we were at the beginning of the year
- The additional FCF was driven by higher earnings, lower CapEx, customer prepayments on supply agreements, partially offset by increases to working capital associated with stronger growth and NSG and modem momentum

### ***Guidance***

#### ***Operating Income and Revenue***

- Based on these factors, we're raising our full-year revenue guidance by \$700mm to \$62B, operating income guidance by \$900mm to \$18.8B, and EPS guidance by \$0.25 to \$3.25 per share
- The improvement in revenue outlook is primarily driven by higher expectations of the PC business and continued momentum in memory
- The improvement in operating margin is primarily driven by our increased revenue outlook and lower spending
- The increase in EPS is driven by higher expectations of revenue coupled with gains on the sale of our equity investments

#### ***Gross Margin***

- And on slide 11, as we look to Q4 2017, we are forecasting the midpoint of the revenue range at \$16.3B, up 3% y-over-y excluding McAfee
- We expect operating income of \$5.2B with gross margins flat y-over-y and spending, as a percentage of revenue, to be down approximately 2 points
  - We expect EPS of \$0.86, driven by operating margin expansion and higher revenue

### ***PC-Centric Team***

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- 2017 is shaping up to be a record year for Intel
- We feel great about where we are nine months into our three-year transformation
- Since January, we have raised our revenue outlook by \$2.5B, our operating income by \$1.7B, and our EPS by \$0.45
- At the same time, we are investing to compete and win in an expanded market
- Our PC-centric team continues to operate very well in a down market and our data-centric businesses are up double digits collectively, as we continue to transform the company to power the cloud and smart connected devices

## QUESTION AND ANSWER SECTION

**<Q - Ross C. Seymore>**: BK, a longer-term one for you, you rattled off a number of AI advancements that Intel is having, whether it be on the Nervana side or the Stratix side. Can you talk a little bit about the competitive environment in there? You mentioned that it's not going to be one size fits all. But you could give a little bit of how Intel does have an advantage vs. some of the early movers in that space. And then perhaps, more importantly, when will we externally as investors be able to start to see the financial benefits of these new products?

**<A - Brian M. Krzanich>**: Hi, Ross. So let's talk about this. We can kind of break this down. So, first, we are already seeing the benefits of AI in that. Remember, as I said, we lead in inference, which is the actual application of artificial intelligence, and we're continuing to really grow in that space.

I think AI, if you take a look at it in general, machine learning, it's the smallest segment to a workload if you look at the data center, but the fastest growing. So you're going to see it continue to become a bigger and bigger portion of our business. You're seeing the effects in our numbers already around Xeon, Xeon Scalable, the FPGAs; we talked about the Microsoft Brainwave launch that's occurring. So those products you're going to see, I'll call those more of our traditional products. And also at the lower end, outside the data center, things like Movidius and now Mobileye, you're seeing those hit our P&Ls as well real-time now as we speak.

The other products like Nervana, you'll start to see really more towards the back end probably of 2018 from a P&L perspective. If you take a look at Nervana, it actually – we get our first silicon out. It will be handed out as test silicon. We have a yearly cadence of products, and so I expect the first substantiations to be more people figuring out how to use it. It won't be a big impact. But as we go through next year and move on beyond that and get the second generation and beyond, that will grow, we believe, quite considerably.

And then products like Loihi, which is our neuromorphic, are same things. The part we've put out so far is really a chip for people to begin to use and learn how to program with neuromorphic, which is a very different type of machine learning. It lets you learn at hundreds of times faster rates than traditional, I'll say, GPUs and CPUs, especially around visual learning. Those as well you'll start to see late next year and beyond as people really begin to learn how to program with these. So seeing it already and those newer products really think late 2018 and beyond before they really start to hit P&Ls.

**<Q - Ross C. Seymore>**: Great, thanks for that detail. And then the follow-up question I had was actually for Bob, and it's on the OpEx side, and congrats on the great operating leverage in the quarter. As we think about the ways you can get that operating leverage, in the past Intel seems to have focused mainly on keeping the OpEx relatively flat and then revenue growth driving that leverage. But in the quarter and in the guide that you just delivered, it looks like OpEx is down about 6% y-over-y. Conceptually, as we go into the next couple years, how do you think investors should think about the balance of delivering that cadence up to the 30% mark that you're looking for over the next couple years? Is it more revenue growth, or are you indeed going to be cutting the absolute level of OpEx?

**<A - Robert H. Swan>**: Ross, great question. First, as you mentioned, we had great progress in Q3. We started the year at a spending level which was a little over 35% of revenue, and we came into 2017 saying that we would get that

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down to roughly 34%.

Reflected in our guidance is it will be closer to 33%, so we're delivering well ahead of our expectations, which have been a function of the two things you highlighted: one, much stronger growth; and two, lower spending levels. And those lower spending levels from H1 this year to H2 are a function of continuing to look at every dollar that we spend, whether it's R&D, whether it's sales and marketing, or whether it's G&A, and making sure that those dollars are allocated towards the biggest growth opportunities, and we are not to redeploy that capital or to get it out of the ecosystem. So our H1 to H2 spend levels will be down roughly \$700mm on a business that will be roughly \$2.5B bigger in H2 vs. H1.

So we're making great progress on making real trade-offs on our spending levels and getting the benefit of stronger growth, and we expect the combination of those two to continue as we go forward.

**<Q - Stacy Aaron Rasgon>**: First, I wanted to ask a little bit about the revenue drivers. Revenue upside for the year and I guess marching up for three quarters, but it continues to look to be the same trend, almost entirely from PC and memory. In the meantime, this is, in your own words, your biggest server refresh in a decade, and yet we're not seeing any upside. We're doing 7% y-over-y pretty much for the full year, which I guess I would classify as barely high single digit. We're not really seeing meaningful ASP increases from mix as Purley ramps. I was wondering if you could just give us a view on I guess your expectations for data center, where it's coming in, why we're not seeing more upside from the Purley ramp vs. what we've seen from prior platform introductions, and whether or not 7% actually would qualify as high single digits by your definition.

**<A - Brian M. Krzanich>**: I'll start and Bob can jump in, Stacy. First, because you've got a couple questions in there, what I would tell you is that the Purley ramp has just really started. It starts with the big cloud service providers. You saw Google talk about it a couple weeks ago. You saw Microsoft talk about it earlier this week. Those ramps are just beginning. I talked about the 200 design wins or design-ins at customers. Those are just starting to come out, so we're really early. These ramps, remember because we have to – it will go through the cloud service providers and the Tier 2 cloud service providers, then on into comms and eventually into enterprise as well. This is going to take a year or more. So I think it's early to make this judgment. The ramp is right within the range we predicted it to be from a ramp of that product

The second part of your question, is 7% high single digits, I'll just make it simple and say look, if you look mathematically, I think it would meet a minima of high single digits, but it's certainly not necessarily where we're targeting to get to, but it's a high single digit number. I'm not going to – the math doesn't lie.

**<Q - Stacy Aaron Rasgon>**: Thank you.

**<A - Robert H. Swan>**: I'll just maybe add a little bit, I think, on the first part of your question. Overall, growth for the year relative to the expectations back in January, revenue will be up \$2.5B. Obviously, PC is a significant part of that. Memory is growing faster. IoT is growing faster. PSG and data center, PSG faster in H2 vs. H1 and DCG in line with our full-year outlook at the beginning of the year to be high single digits. So real good strength on clients, on memory, on IoT, and in line with the other businesses.

The other thing I'd just offer to follow up on Brian's commentary on DCG growth, maybe two things. One, we started out at 6% in Q1. We were at 9% in Q2. We're at 7% in Q3 off a real tough comp last year of double-digit growth in Q3. So I would say from a top line perspective, we're right in line with the guide that we gave at the beginning of the year.

And secondly and as importantly, our operating margins have continued to grow significantly quarter on quarter through the course of the year, with 46% operating margins in Q3. And we told you early on, despite a relatively slow start, the fact that operating margins for DCG to be above 40% for the year, and we're well on track to hit that important metric as well. So nine months through the year, great start to the year for us and DCG in line with our expectations and building momentum as we exit the year.

**<A - Mark H. Henninger>**: Did you have a follow-up, Stacy?

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**<Q - Stacy Aaron Rasgon>**: I do, thank you. I wanted to ask about gross margins really quick. So revenue was up 6% I guess y-over-y excluding McAfee. Gross margins are down like 90BPS y-over-y. I was hoping you could give us some color on the drivers of that shift. And in particular, how should we think about the trajectory exiting the year into 2018, puts and takes on gross margins as we go into next year, given what we've seen this year?

**<A - Robert H. Swan>**: On your first part, we laid out for the year 63% gross margins. And we're pretty much in line with that throughout the first nine months, and our outlook for Q4 is another 63%, so in line with the full-year outlook, which is in the high end of our historical guide range. So we feel pretty good about where we are.

For the dynamics underneath the covers, the trends have been fairly consistent: volume leverage with good scale going through the fabs; ASPs modestly better, much better in H1 on easier comps, slightly better in H2 on tougher comps. Unit cost continues to come down. The ramp costs associated with 10-nanometer are lower.

And offsetting those, you really have three things going on. One, we have a high growth in our adjacent businesses of memory and modem that weigh on – that are a big contributor to improved earnings, but they weigh on our gross margin. Secondly, we have higher engineering samples as we go into Q4. And third, the co-marketing change that I mentioned in the prepared remarks, Stacy, that has no impact on operating income but a modest impact on gross margin but offset by lower spending levels.

So you take those all into account and they've delivered solid Q3 dynamics, solid Q4 outlook. And the one change between Q3 and Q4 is primarily attributable to the mix of the higher-growth adjacency businesses. Those trends and those dynamics, we'll talk much more about 2018 in January, but those trends have been fairly consistent for the last four quarters.

**<Q - Blayne Curtis>**: Hey, thanks for taking my question. Bob, I just wanted to go back to some of the comments you made. In DCG, op margin was up a ton. It's actually above your full-year, so just curious where those cuts came from. And then as you look forward, I know you're not going to forecast for next year, but is there any reason why the spending would go up and down from here?

**<A - Robert H. Swan>**: H1 gross margins – I should say operating margins were lower, H2 much stronger. Fundamentally, it's less about cuts, to be honest with you. It's more about continuing to grow the top line. continuing to get ASP improvements or compensated for the performance that we're delivering, and modestly lower unit costs. So the combination of those three are getting really good leverage and allow us to expand operating margins while we continue to invest in obviously Xeon but also in artificial intelligence. So that's what's driven H1 to H2 dynamics. As I indicated, we started out the year saying that we were highly confident we'd be above 40% for the year, and that's how it's played out during the course of the year.

**<Q - Blayne Curtis>**: Great. And then I wanted to go back to the question on AI and inference, Brian. I was wondering if you could just comment on – today I think you said it was small. I was just curious. Out of the cloud spend, how much is inference today? And when you look at future workloads driving server units, where could that be in a couple years?

**<A - Brian M. Krzanich>**: Sure, we don't separate out inference. So what we said is simply in the past publicly that AI is one of the smallest workloads and in fact one of the fastest growing. We haven't broken out – beyond just saying here's what cloud is growing at and here's what comms and here's what enterprise, we don't break out by workload. And there's a variety of reasons for that. Part of it, it's sometimes hard. The mixture of what – when somebody goes out and builds a rack, what is it going into? How much of its workload is really being used by AI? Anybody who tells you exactly what that number is, is just wrong, to be honest with you.

So it's very hard for us to say with precision that X percent of our units went into AI workloads because it's rare that a rack is purely AI except for rare cases. But we know that it's small, just by the type of interactions we have, but also fast-growing and one of the biggest areas of interest.

**<Q - John William Pitzer>**: Yeah, good afternoon, guys. Thanks for letting me ask a question. Congratulations on the strong results. Bob, maybe I can just ask Blayne's DCG op margin question a little bit differently. In the calendar third



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quarter, you actually I think had revenue up about \$500mm sequentially in that business roughly, and operating profits grew by about \$600mm sequentially. Can you just help us understand what drove that dynamic? Were there any one-times? And just given how strong the operating margin is, I know you've reaffirmed for the full year. But is Q3 level the new norm we should start basing operating profit off of, or was there something specific in Q3 that drove the op margin leverage above 100% sequentially?

**<A - Robert H. Swan>**: No one-timers. In one sense, John, it's no real surprises for us. We anticipated growing throughout the year. We anticipated higher ASPs, i.e., sequential ASPs being a little bit stronger, and that would drive incremental operating income. And some of the benefits of just a lower overall G&A spending for the company is benefiting all the different P&Ls. The G&A is actually lower. So that's what's really been driving the improvement sequentially.

As you can tell from our full-year guide, there will be more of the same in Q4 relative to Q3. And then in terms of implications going forward, we got a great business. We've redefined the role we play in the data center business to be not a high 90% share player, but a 30% share player with lots of room to grow. And we expect that to be a continued important source of growth, both top and bottom line for the company. The specifics around that we'll talk more about it in January.

**<Q - John William Pitzer>**: That's helpful. Maybe for my follow-up for Brian, Brian, I know this is not a big part of your growth strategy going forward. But as you mentioned in your prepared comments, CCG is still very important to scale advantages, to profitability, to FCF, to your ability to invest in growth markets. And that's been a business that's been sort of remarkably stable over the last four or five quarters. It's grown over the last couple of years, in part because we've had relatively easy compares in the PC market. So I'm kind of curious, as you think about this business over the next call it four to eight quarters, how are you guys thinking about the corporate upgrade cycle or refresh cycle on PCs, the consumer refresh cycle, the gaming market, and I guess importantly, the modem business which is becoming a bigger and bigger part of this business over time? Do think you can still keep this business sort of on a flat growth trajectory, or how are you thinking about it?

**<A - Brian M. Krzanich>**: Sure. So you've captured it quite well. Let's just talk about this. We can talk about it from a unit standpoint and then we can talk about it from how has our business done. From a unit standpoint, the decline has certainly slowed down. If you go back a year or two ago, we were high single digits to low teens declines at times y-over-y from a unit basis, and that slowed into the low single digits that we're seeing today, but we still are seeing a decline on a unit level.

And I always remind people, we've taken probably something like 25% of the annual units out of this business, yet grown in that timeframe the profitability of that business significantly. So, that I think just talks about both the great execution in products and segmentation strategy and just the leadership that that team, at first with Navin Shenoy and now with Greg Bryant, have really delivered to the company.

So our view is, John, that if you take a long-term view, we see the pattern kind of stabilizing at about where it is. I think we'll come in here and there will be quarters when the units are up slightly, and there will be other quarters when the units are down a little more slightly. But when we look at it over the long haul, they're probably going to be down those low single digits.

But we also see segments that are growing, that are very performance focused, which allow us opportunity. So you talked about them, gaming, 2-in-1 devices, thin and light, the Ultrabook as we like to think about it from the old, those products are continuing to see growth actually, and they are pushing that record Core i5, Core i7. They're pushing the desire for Core i9, which is a new product we introduced. Those are what's driving the segmentation, the ASP uplift, and the increased profitability. We think to some level that trend will continue. How long? I'm not going to be that good a prognosticator, but certainly for the near-term future, we don't see this trend shifting very much.

**<Q - John William Pitzer>**: And then, Brian, just on the modem side, your prepared comments, I think you said it was up 37% y-over-y. What's the sustainability of that business and your ability to continue to grow that business through penetration?

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**<A - Brian M. Krzanich>**: Yeah. I'm excited about the modem business. We, I think, really gotten a team together that is world-class. We believe we now are on a yearly cadence of world-class modems, which is really critical. That's a big hurdle to get that technology to where you can reliably put out on a yearly cadence a world-class modem. We believe we're there now. We continue to increase the profitability or the efficiency of that organization, which we've always talked about in the past, and that's continued. So we think we can continue to both drive the technology and continue to grow that business.

**<Q - Romit Jitendra Shah>**: Great EPS growth. Bob, I think some of us who are more on the optimistic side definitely see a path to \$4.00 of EPS, which makes Intel look compelling. I think some of the pushback though has been among value investors who look at FCF. And this year, for example, even with the equity gains, it looks like FCF is tracking down. So I know that this is an investment year, but how should people be thinking about FCF growth relative to EPS growth next year and maybe even 2019 as well?

**<A - Robert H. Swan>**: First, in 2017, people ought to be thinking about FCF growth being \$1.5B to \$2B higher than what was primarily reflected in our guidance, because we're saying that our current forecast will be much better than kind of where we started the year. And that improvement is really a function of three things; one, earnings growth, more operating earnings growth as opposed to the ICAP gains, but real solid operating earnings growth. Secondly, we reduced our CapEx outlook for the year from \$12B to \$11.5B this year. And third, the long-term agreements that we signed in the year.

One of the benefits in what we're trying to do is really match our net capital deployed in memory in conjunction with demand from strategic clients and partners, which has the effect of reducing the impact of the memory capital intensity on the FCF to the business that makes sense for our customers and makes sense for us. So we'll continue to look for those opportunities.

The biggest gap between our earnings performance and our FCF performance has been the higher capital associated with growth, number one, but in particular, memory. And we're really looking for opportunities to reduce our net capital deployed into memory, which will in turn grow FCF over time just closer and closer to our EPS growth.

**<Q - Romit Jitendra Shah>**: And I guess along those lines, Brian, can you just give us an update on how you're thinking about CapEx at these levels and going forward?

**<A - Brian M. Krzanich>**: Sure. I think in our statements and in the release, we showed you that we actually lowered CapEx by about \$500mm for this year. We've talked about CapEx and thinking about it as being in this range. I don't think we have anything else to say about – it's pretty close right now. We're just focused on the execution into Q4 and prepping for our view for 2018. So I don't want to have any other discussion on CapEx until we get to the January timeframe right now for 2018.

**<Q - Harlan Sur>**: The ASP trend in DCG was up 2% y-over-y, but it can be skewed by mix. So if we look at the four sub-segments, cloud, comm, service provider, enterprise adjacencies, if we just look at those buckets as a silo as you ramp Skylake, did ASPs move higher in all of those sub-segments? I'm just trying to get a sense for how broad-based the value capture was.

**<A - Robert H. Swan>**: I would just, without giving you all the specifics of ASPs by segment, I would just say the biggest driver of ASP improvement is really incremental performance. So as we continue to transition – yes, we're still transitioning Haswell to Broadwell, which all else equal there are positive ASP implications as we transition to Xeon Scalable and deliver higher performance. That growing mix of higher-performance products is the single biggest contributor to ASP. We're still in the early days, as Brian mentioned, in Xeon Scalable, but that is a high-performance product. And we would expect that will share in the benefits of high performance for our clients with higher ASPs. But that's the biggest dynamic.

**<Q - Harlan Sur>**: Great, thanks for the insights there. And the team has talked about accelerating the server roadmaps to be more closely aligned with the cadence of manufacturing technology migrations, I believe starting with the 10-nanometer node. Can you guys just give us an update there?



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**<A - Brian M. Krzanich>**: Yes, think of it – so first, absolutely you’re right that we are going to move much more of our focus towards data center products coming first. It’s not going to be the early part of 10-nanometer, though. You’ve got to look at the design cycles. And you make a decision like that, even if you make it last year, you’ll start to see the effect at the back end of 10-nanometers and you’ll really see it affect 7-nanometers, so not these early products on 10-nanometer, though. They were already in the hopper when we made that move.

**<Q - Matthew D. Ramsay>**: Bob, I wanted to ask a little bit about G&A leverage. You talked about in the script and in some of the Q&A here some changes to the co-marketing programs and the like going forward in both the PC and in the data center business. Is there any way you could maybe bound for us the size of those and their contributions to what the run rate has been of overall OpEx, and what kind of opportunities there are potentially to further restructure those going forward? Thank you.

**<A - Robert H. Swan>**: Yes, just on the co-marketing program in particular, really what we’re trying to do is retain the value of the Intel Inside brand, but also to be more flexible and align our spending in conjunction with our customers, more tailored programs by customer to drive more efficient demand. That’s the intent of what we’re trying to accomplish, and we’re pretty excited about the change.

The quantification of that strategy in essence in Q3 was roughly \$200mm that in essence shifted from spending to contra-revenue, so no impact on operating income dollars but roughly \$200mm lower revenue, \$200mm lower spending. And we expect that to be modestly higher as we go into Q4. So again, more effective and efficient way to spend our marketing dollars in conjunction with tailoring programs with the OEMs, that drives the change in the geography of how those dollars are reflected in our P&L but doesn’t really impact our operating income.

**<Q - Matthew D. Ramsay>**: Thank you, that’s really helpful. And then as a follow-up, Brian, in the automotive space, I think you mentioned 14 ADAS wins for Mobileye vs. 12 all of last year, and that’s in the ADAS space. And you have some of your competitors making quite bold announcements about wins towards autonomous driving programs long term. Maybe you could talk about how commitments are being made in ADAS vs. autonomous and then how the acquisition that you’ve seen so far of Mobileye has maybe pulled some of your computing assets into these conversations for longer-term autonomous. Thank you.

**<A - Brian M. Krzanich>**: Sure, that’s a great question. So we mentioned that even out of those 14, many of those continue on up into Level 3, Level 4. The Level 5 work that you see out there is pretty far out there. And I’d tell you that’s there’s a lot of just experimental work going on there.

If I take a look at the bigger picture, which is what you’re asking, this whole picture that we’ve been putting together is – I said in the statement that individually these businesses are great. But when you put all these together into one package and you’re able to walk into a customer with a complete solution, they’re truly world-class and something nobody else can deliver.

So you’re right, when we go in and we talk to somebody about autonomous driving in general, whether it’s Level 2 bots, Level 3, Level 4, or Level 5, we bring with us a suite of products, depending on what kind of architecture. And what we’re seeing is different OEMs, different customers thinking about those architectures even differently across that spectrum. Some are thinking but by Level 5, I think my skills will be up. I want a closed system. I want to have much more control of the software. So we have a set of solutions we bring to them there. Some of them want to have more FPGAs for how they bring their software down onto the silicon earlier on.

But what we’re able to do is bring our modems. We shipped, and we mentioned it in the release, our first automotive modem. So we’re able to bring automotive modems all the way through 5G. Most of these car companies are having to build data centers, and not just data centers, centralized data centers, but really a data center architecture that goes all the way out with data and compute at the edge. You’re going to want to be able to manipulate and transfer mapping, high-precision mapping, to the cars and data back from the cars to change those maps’ construction and things like that. So we’re building that architecture, and we have the products and the talent to uniquely work with them all through that infrastructure.

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And then you get out to the car again and we can bring the FPGAs, the Mobileye for sensor fusion or compute. We can put Xeons in there. And each one of these discussions, they're all a bit different. They all have multiple phases as you go through 3, 4, and 5 on the levels. And what we're able to do is say you don't have to just take this one solution. This is not the only solution there is. What would you like to do? What best solves your problem in the most cost-effective, lowest power, efficient way? How much work do you want us to do in software and development vs. how much work do you want to own and have IP within your company? And that's changing, as we said, over time.

And that's part of also why we're building out that 100-car fleet. Amnon [Shashua] really has driven a vision that says it's one thing to bring foils to a meeting. It's another thing to bring a car and say now let's go out and drive and show you how all of these fit together. So all of that is – this package that we have is unique and it's resonating quite well as we walk in to the various car OEMs. And I'm out there with them in various modes almost every week, every other week. Amnon is out. We're all talking about a complete package.

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