

## Q1 2018 Earnings Call

### Company Participants

- Brian M. Krzanich, Chief Executive Officer & Director
- Mark H. Henninger, Vice President, Finance and Director, Investor Relations
- Robert Holmes Swan, Chief Financial Officer & Executive Vice President

### Other Participants

- Chris Caso, Analyst
- Christopher Brett Danely, Analyst
- John William Pitzer, Analyst
- Romit Jitendra Shah, Analyst
- Ross C. Seymore, Analyst
- Stacy Aaron Rasgon, Analyst
- Timothy Arcuri, Analyst

## MANAGEMENT DISCUSSION SECTION

### Operator

Good day, ladies and gentlemen, and welcome to the Intel Corporation first quarter 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 follow at that time. And as a reminder, this conference may be recorded.

I would now like to turn the conference over to Mr. Mark Henninger, Head of Investor Relations. Sir, you may begin.

### Mark H. Henninger {BIO 17653227 <GO>}

Thank you, operator, and welcome, everyone, to Intel's first quarter 2018 earnings conference call. By now you should have received a copy of our earnings release and the CFO earnings presentation that goes along with it. If you've not received both documents, they're available on our investor website, [intc.com](http://intc.com). The CFO earnings presentation is also available in the webcast window for those joining us online.

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

Before we begin, let me remind everyone that today's discussion contains forward-looking statements based on the environment as we currently see it, and as such, does

include risk and uncertainties. Please refer to our press release for more information on the specific risk factors that could cause actual results to differ materially.

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

With that, let me hand it over to Brian.

**Brian M. Krzanich** {BIO 4634082 <GO>}

Thanks, Mark.

Coming off a record 2017, 2018 is off to an exceptionally strong start. Q1 was Intel's best first quarter ever and significantly exceeded the expectations we set in January. Our Client Computing Group continued to execute well, producing growth within a declining PC market. And our transformation to a data-centric company accelerated, with our data-centric businesses, including McAfee, up 25% over the first quarter of last year.

The strength of Intel's business underscores my confidence in our strategy. What we're seeing is an unrelenting demand for compute performance, driven by the continuing growth of data and the need to process, analyze, store, and share that data. That dynamic benefits our traditional CPU business, and it reinforces the big bets we've made in memory, modems, FPGAs, and autonomous vehicles. We're competing to win in our largest collection of addressable markets ever. And importantly, we're not just competing in these markets. We're leading and shaping them, as our first quarter results demonstrate.

Data Center Group revenue was up 24% year over year. We saw broad-based demand strength across all DCG segments in Q1. And customer preference for high-performance products, including Xeon Scalable, drove a richer ASP mix. The cloud segment grew 45%. And in the comm service provider segment, we continued to take share and grew revenue 33%, as customers chose IA-based solutions to virtualize and transform their networks as the industry prepares for the 5G transition.

Intel's presence at the Winter Olympics in Pyeongchang was a powerful showcase of our 5G capability. Intel and KT deployed the world's largest 5G network to date, including more than 20 5G links, delivering 3,800 terabytes of network capacity. We've established leadership in 5G. And when commercial networks begin deploying around 2019, we'll be there with industry-leading products, from the core of the data center to the edge to mobile devices.

And we also saw growth in our enterprise segments for the second consecutive quarter, as macro strength continued and customers prioritized hybrid and on-premises infrastructure investments.

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Data center customers are also looking to FPGAs for workload acceleration. The Programmable Solutions Group again set a record for design win volume, and those design wins are translating directly into revenue. PSG's business grew 17% in Q1 on data center and embedded strength along with last-time buys. PSG's data center segment was up 150% over last year. And the advanced products category, our 28, 20 and 14-nanometer solutions, grew more than 40%.

Microsoft also recently announced that they're using Intel's FPGAs to power new Bing Intelligent Search features using real-time AI. PSG's momentum is evidence that our 2016 acquisition of Altera is delivering value for our customers and contributing directly to Intel's growth.

Our IOTG [Internet of Things Group] business grew 17% on record unit volume, with continuing momentum in the retail and video segments, as compute increasingly moves to the edge. Consistent with our commitment to be disciplined with our resources, we made the decision to divest Wind River and sharpen the focus of IOTG on other growth opportunities that more closely align to our strategy.

The memory business set a revenue record, growing 20% in the first quarter, crossing over the \$1 billion mark in revenue. The last business that passed that mark was DCG, crossing over that mark over a decade ago. Both yields and output in our Dalian factory continue to ramp ahead of schedule. In fact, we believe the Dalian fab expansion is one of the fastest brownfield wafer starts projects in memory industry history.

We also launched our first mainstream Optane SSDs for clients, known as the 800 Series, driving further industry adoption of this revolutionary technology. The NSG remains on track to be profitable for the full year.

And we continued to demonstrate momentum in autonomous driving, and I'm happy to report that the Intel Mobileye autonomous vehicle test fleet has begun to operate in Israel and will expand to other geographies in the coming months. Our fleet fully implements the Responsible-Sensitive Safety system, or RSS, that we introduced last year. This unique system applies a formal common-sense safety seal to the vehicle's decision-making, resulting in the optimal combination of provable safety and human-like driving style.

We believe that the winning path to autonomous driving will be a progression from ADAS capabilities to full autonomous driving. And we're seeing significant momentum in the marketplace, including a recent high-volume design win for EyeQ5 with a European premium vehicle manufacturer.

And finally, the Client Computing Group extended its strong track record of execution in a challenging PC environment. Revenue was up 3% despite a declining PC TAM, on strength in the commercial and enthusiast segments, leading to a strong Core mix. The CCG launched its first-ever i9 processors for laptops in the first quarter, again demonstrating our outright product leadership.

We continue to make progress on our 10-nanometer process. We are shipping in low volume and yields are improving, though the rate of improvement is slower than we anticipated. As a result, volume production is moving from the second half of 2018 into 2019. We understand the yield issues and have defined improvements for them, but they will take time to implement and qualify. We have leadership products on the roadmap that continue to take advantage of 14-nanometer, with Whiskey Lake for clients and Cascade Lake for the data center coming later this year.

Moore's Law is central to our strategy and our product leadership. It continues to create significant value for Intel and our customers. While it's taking longer and costing more to deliver and yield advanced process technologies, we are able to optimize our process and products within the node to deliver meaningful performance improvements.

For example, 14-nanometer process optimizations and architectural improvements have resulted in performance gains of more than 70% since the first 14-nanometer products were launched. We combine these advances in manufacturing technology and architecture to produce truly leadership products. And it's that product leadership that ultimately matters most to our customers and end users.

Intel and the industry stepped up to a tough challenge as we responded to the security vulnerabilities known as Spectre and Meltdown. I'm pleased with our progress and proud of how Intel and industry partners addressed this issue collaboratively with transparency and with customer-first urgency. We're delivering against our security-first pledge and we've now rolled out micro code-based mitigations for all Intel products launched over the last nine years that require protection against Spectre and Meltdown. We'll also begin delivering both client and data center products with hardware-based mitigations later this year.

With our data center transformation accelerating, we're raising our expectations for our full-year results, yet more evidence that our strategy is working. As Intel marks its 50th anniversary, we're well positioned to be the end-to-end platform provider for the new data world and a leader in artificial intelligence and the autonomous revolution.

With that, let me hand it over to Bob.

**Robert Holmes Swan** {BIO 1972621 <GO>}

Thanks, Brian.

Q1 was truly an outstanding start to 2018. Our transformation to a data-centric company continues to build momentum. Revenue was a first quarter record at \$16.1 billion, up 13% year over year. Operating income was \$4.8 billion, up 21% year over year, and EPS at \$0.87 was up 32% year over year. From a capital allocation perspective, we generated \$6.3 billion of cash flow from operations and returned \$3.3 billion to shareholders in the form of buybacks and dividends.

As a result of the strength we are seeing in the business, we are raising our full-year revenue guide by \$2.5 billion to \$67.5 billion. We're raising our EPS guide by \$0.30 to \$3.85, and we're raising our free cash flow guide by \$1.5 billion to \$14.5 billion.

Our Q1 results demonstrated continued momentum in our transformation from a PC-centric company to a data-centric company. Intel's data-centric businesses were up 25% collectively, with each business individually growing double digits. Our data-centric businesses are now approaching 50% of our revenue, an all-time high. Our PC-centric business was up 3% on strength in notebook, desktop, and modem. DCG's strong cash flows fund Intel's investments in new data-centric growth.

As a reminder, we adopted a new revenue recognition standard in Q1. The new standard drove \$462 million in incremental Q1 revenue recognition. This predominantly affected CCG and NSG. By year end, we expect roughly half of this to net out.

Moving to Q1 earnings, we generated significant EPS expansion in the quarter, up 32% year on year. Our non-GAAP EPS improvement was driven by strong top line growth, a 3-point improvement in operating margins, and an 11-point reduction in our effective tax rate. The 3-point improvement in operating margins were driven by a 4-point reduction in spending, partially offset by a 1-point decline in gross margin. The 1-point decline in gross margin was driven by growth in our adjacencies, which have lower gross margins than our CPU products. From a spending standpoint, versus last year, we delivered \$1.3 billion more revenue on \$200 million less spending.

As a second reminder, we adopted a new mark-to-market standard for our equity investments. In 2017, all realized gains and losses were recorded in our non-GAAP results. But in 2018, all mark-to-market adjustments flow through earnings. In an effort to eliminate volatility, we have excluded these adjustments from our non-GAAP results. Our Q1 GAAP EPS included approximately \$0.13 for mark-to-market gains in our ICAP portfolio that were excluded from our non-GAAP results.

We are also making excellent progress on our operating efficiencies. In January, we pulled in our 30% spending goal from 2020 to 2019, and we're off to a good start in 2018. Total spending was down 4% year over year in the quarter. R&D spending as a percentage of revenue was down approximately 2 points. And our SG&A costs were down over 2 points.

Our intensity on spending is designed to accelerate top line growth, and it is paying off. Currently, as a result of strong top line growth, we now expect to meet our 30% spending target in 2018, two years ahead of our original expectations.

Let me touch briefly on our Q1 performance by segment. The Data Center Group delivered a great quarter, much better than expected. DCG revenue of \$5.2 billion was up 24% year over year, and operating income of \$2.6 billion grew 75%. Q1 operating margin was 50%. Overall, unit volume was up 16% and ASPs were up 7%.

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We saw broad-based demand strength in Q1, with customer preference for high-performance products driving richer ASPs. Cloud and comm service provider segments were greater than 60% of the data center business. And this was the first quarter our cloud business has surpassed \$2 billion in revenue, which made it our largest segment in the first quarter.

Additionally, we redefined our expanded TAM for DCG to markets beyond the CPU, like silicon photonics, fabric, network ASICs, and 3D XPoint memory. These adjacent businesses are gaining traction and grew 16% year over year. DCG performance in all segments was better than our January forecast, and we expect that strength to continue to aid DCG momentum through the second quarter.

Our additional data-centric businesses, IOTG, NSG, and PSG, are becoming a larger component of our overall business, growing 18% year over year in the quarter. Our Internet of Things business achieved revenue of \$840 million, growing 17% year over year, driven by strength in video and continued momentum in retail. Operating profit was \$227 million, up 116% year over year, on higher revenue and lower spending, as we shifted our ADAS investments to Mobileye. As you heard from Brian, the Mobileye business is going strong. Q1 revenue was \$151 million. And while it's early in the journey, we are on track to our deal thesis.

Our memory business broke \$1 billion in quarterly revenue for the first time, up 20% year over year, with strong demand for data center SSD solutions. We reduced our operating losses by \$48 million, with strong gigabyte demand and unit cost reductions more than offsetting ASP reductions.

The transition to 64L 3D NAND is improving our cost while we invest in and expand our Dalian factory. We expect the second half of 2018 to be balanced between supply and demand, and we continue to expect this segment to be profitable for the full year of 2018.

The Programmable Solutions Group had revenue of \$498 million, with 17% growth, driven by strength in data center and the embedded segments. Operating profit was \$97 million, up 5% year over year. The PSG team continues to perform and execute well. Our advanced FPGA products, those at 28, 20, and 14-nanometer, grew over 40% in the quarter. In fact, PSG won more customer designs in Q1 than in any prior quarter.

Finally, the Client Computing Group had another strong quarter. Revenues of \$8.2 billion were up 3%, and operating margins were down 4 points due to 10-nanometer transition costs and growth in our modem business. Our PC-centric business continues to perform well in a challenging but improving market and serves as a significant source of cash flow for the company. We saw strength in the commercial and gaming businesses, and we believe the worldwide PC supply chain is operating at healthy levels.

We've laid out our capital allocation priorities: invest organically; expand acquisitively; and return capital to our shareholders and do it wisely. We continued to execute to these priorities. We generated \$6.3 billion in cash from operations. This included \$1.7 billion in cash received from NAND customer supply agreements. We invested \$2.9 billion in

CapEx and delivered \$3.4 billion in free cash flow, up 73% year over year. We returned almost 100% of free cash flow to our shareholders in the form of \$1.9 billion in buybacks and \$1.4 billion in dividends, a 10% increase per share over last year.

Now moving to our full-year outlook, our strategy is working and our investments are paying off. We are now forecasting the midpoint of the revenue range at \$67.5 billion, up \$2.5 billion versus our expectations in January. We expect operating margin of approximately 31%, up 1 point from January, as spending as a percent of revenue drops to approximately 30%. Versus prior estimates, gross margin will be approximately flat, as broad-based strength in our business is offset by the higher costs associated with the 10-nanometer volume production shift to 2019. We now expect a full-year tax rate of 13%, 1 point down versus our prior estimates.

Overall, stronger top line growth, improved operating margins, and a lower tax rate will boost EPS to \$3.85, up \$0.30 versus prior estimates.

From a cash flow perspective, we are increasing our free cash flow to \$14.5 billion, up \$1.5 billion from January. We now expect net capital deployed of approximately \$12.5 billion, up \$500 million versus the expectations we set in January. This reflects gross CapEx of approximately \$14.5 billion, offset by approximately \$2 billion of customer prepayments for memory supply agreements.

In Q2, we expect strong growth to continue. We are forecasting the midpoint of the revenue range at \$16.3 billion, up 10% year over year. We expect operating margin of approximately 30%, up 1 point versus last year, which reflects approximately 1.5-point decrease in gross margin and a 2.5 to 3-point decline in spending. We expect EPS of \$0.85, up 31%, excluding equity adjustments, from strong top line growth, spending reductions, and a lower tax rate.

To sum it up, we believe 2018 will be another record year for Intel. We've met and exceeded our financial commitments, and we feel great about where we are relative to our 3-year plan. Our PC-centric team keeps winning in a challenging market and our data-centric businesses are growing fast, fueling Intel's transformation to a company that powers the cloud and smart connected devices.

With that, let me turn it over to Mark, and we'll get to your questions.

**Mark H. Henninger** {BIO 17653227 <GO>}

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

**Q&A**

**Operator**

Thank you. And the first question will come from the line of Ross Seymore with Deutsche Bank. Your line is now open.

**Q - Ross C. Seymore** {BIO 20902787 <GO>}

Hi, guys. Thanks for letting me ask a question and congrats on the strong results. Brian, one for you about the sustainability of this demand, specifically on the data center side. I think people are pretty aware that the macroeconomic drivers are all going the right way, and that's helping the enterprise side of things. But the acceleration of the cloud on the comm side for the last two quarters is beating your own expectations for growth rates and have been quite strong. How much of that do you believe is Intel-specific, and if you can go into the reasons why, or is the macro side really the bigger driver on those two vectors as well?

**A - Brian M. Krzanich** {BIO 4634082 <GO>}

Sure, Ross. That's a good question. Let me try to answer it. So the first thing I'd tell you is that there is a bit here that the transition to cloud continues to occur. It's occurring at a bit even faster rate, so that you do see that trend going on. Remember, we've always talked about that over the long haul you have to look at these a bit. It can sometimes be lumpy. So our forecast for the long term is still in that high teens, low 20s range for that kind of growth.

We thought that enterprise is clearly up. We think that, as you said, a lot of that is reinvigoration of investments by companies in onsite data. Our view of the long term there, as I look out over the long term again, it's still that should be in a declining mode versus moving those workloads long term over to the cloud.

So, if I take a look at this, as Bob said in his prepared remarks, if I look at our data-centric businesses in general, so even just beyond the data center, we see these growing in that mid to high teens range. And that's how we view this, and we do believe that is sustainable. And it will move from cloud to enterprise. And sometimes you'll see IoT pick up a bit and offset something, but that's why we grouped those into that data-centric, but they're all really tied together. It's data coming from the edge, moving through the network into the data center, and really being based in the cloud and analytics being applied to it, and people using that data then to make decisions or drive businesses. So we think it's sustainable in the data-centric numbers that you saw, but it will float between those various segments.

**A - Robert Holmes Swan** {BIO 1972621 <GO>}

The only thing, Ross, that I would add is in terms of our outlook in the more near term, our outlook for the year is continued strength into the second quarter, similar to the first quarter. But beyond that, it's probably a little cloudier. I think we are benefiting from global macroeconomic environments. I think the higher earnings and the ability to deduct IT-related expenditures I think has given CIOs a little more money to spend. And we see ourselves benefiting from that through the first half of the year. Second half is going to be a little bit of a wait-and-see as to whether the short-term dynamics continue into the second half.



But if you go back to Brian's comments, I think what we do know is this increased demand for compute data, analytics, storage, rapid retrieval is what's really driving the demand for high-performance compute. And not only do we see the unit volume strength, but also the ASP strength, which we think is a function of Intel-related products.

**Q - Ross C. Seymore** {BIO 20902787 <GO>}

That's very helpful. For my follow-up question, for either of you, frankly, on the 10-nanometer pushout, do you believe that the competitive lead you have versus your competition is shrinking, or is this a challenge everybody is going to have? And then the gross margin side of that equation, Bob, you said it was going to be a headwind into the full-year guide. Any sort of linearity about when that starts to move from being a headwind to a tailwind would be great. Thanks.

**A - Brian M. Krzanich** {BIO 4634082 <GO>}

Sure, Ross. So let me start with we absolutely have product and process leadership. We're shipping 10-nanometer products today. So I did want to make sure that that was very clear to you, and those are the densest, highest performing products out there.

We're slowing the ramp down as we go and fix these yields, and we're able to do that. A), we understand the yield issues. They're really tied to this being the last technology tied to not having EUV and the amount of multi-patterning and the effects of that on defects. But also, the real strength of 14-nanometer, I mentioned in my prepared remarks that we've done 70% improvements in the performance of that technology over its current lifetime. And we believe it continues to have legs, that we can continue to make improvements, both within that process technology and architecturally. That's really giving us the breathing room to go and make these yield improvements.

So it's really balancing between delivering the world's best products. So we believe our roadmap for 2018 is as strong or stronger than it's ever been. And we have the ability to carry that into 2019, allowing us to get the yields where we want them to be. So the cost and the spending are really in line with what you as a shareholder expect from us.

We believe that if you take a look at others during this timeframe, if you looked at anybody else and said 70% improvement on a technology node, they may rename those nodes as we go through this. And we have always chosen to be really transparent and clean and just say it's improvements on the existing technology rather than renaming. So we believe we have that.

Now as we look out in time, we do see the density. If you just take that component, the density gap is narrowing a bit, but that's out in time. But again, performance is really a function of multiple parts of the process around power and performance and in architecture. And that's why we think our products continue to lead and be the world's standard.

**A - Robert Holmes Swan** {BIO 1972621 <GO>}

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And on the gross margin question, the strong both volume and ASP performance in the first quarter contributed to gross margins being 2 points ahead of our expectations at the beginning of the year, so we saw that real good performance on the top line flowing through in the first quarter.

What we indicated for the full year, though, there's no change in our full-year gross margin. That essentially is a function of continued volume and ASP strength, but partially offset by yields that are improving but not quite at the rate that we had anticipated on 10-nanometer. And secondly, our costs associated with - we expected at the end of the year that we'll have pre-PRQ reserves that will be a little bit higher as we shift into 2019. So strong first quarter, strong for the full year, but those 10-nanometer costs will be a little bit of a drag.

When we step back, we still look at gross margins for the full year that are at the high end of our historical range, in the 60% to 65% range, which is good. And for us, that's despite the fact that we're getting really solid growth from our lower-margin but earnings-accretive businesses like modem and memory. Thanks, Ross.

**Q - Ross C. Seymore** {BIO 20902787 <GO>}

Thank you.

## Operator

Thank you. The next question comes from the line of Stacy Rasgon with Bernstein Research. Your line is now open.

**Q - Stacy Aaron Rasgon** {BIO 16423886 <GO>}

Hi, guys. Thanks for taking my questions. I wanted to follow up on that 10-nanometer point. So as the volume production pushes out into 2019, given you understand the yield issue supposedly, is this a first half pushout, or does it push out into the second half? And when it actually does ramp, do you think it actually will be the current 10-nanometer process that's shipping, or will that be slipping out to 10-nanometer plus potentially?

**A - Brian M. Krzanich** {BIO 4634082 <GO>}

So I'm just going to correct you. You said that supposedly we have the solutions. We do understand these, and so we do have confidence that we can go and work these issues, Stacy. Right now, like I said, we are shipping. We're going to start that ramp as soon as we think the yields are in line. So I said 2019. We didn't say first or second half, but we'll do it as quickly as we can based on the yield.

The last part of your question about whether will it be a 10 or 10-plus-plus or 10-plus I think was your question, the yield improvements that we're making are just that, more focused on yield. So think of them as improvements to the various edge stuff, the lithography stuff, thin cleans (33:54) and things like that in order to really drive the multi-patterning and, in some cases, multi-multi-patterning, where you have four, five, six layers

of patterning to produce a feature. It's really about that. They aren't necessarily around performance.

We do have plans on 10-nanometer already, similar to 14-nanometer, for 10-plus and 10-plus-plus. And so we think all of these technologies now have multiple years of performance improvements built into them as they come off the floor.

**Q - Stacy Aaron Rasgon** {BIO 16423886 <GO>}

Thank you. For my follow-up, I wanted to ask about gross margin drivers and free cash flow drivers into 2019. We have CapEx pretty significantly outpacing depreciation at the moment. You'll have that 10-nanometer ramp starting. Memory and modems are probably going to be growing. And then on the free cash flow side, we've got the reversal potentially of the NAND prepayment eventually as you start shipping the NAND that you've been paid for. How do we think about the drivers, gross margin puts and takes around those elements and maybe others as we go through - get into 2019?

**A - Robert Holmes Swan** {BIO 1972621 <GO>}

First, I'll probably not dwell a whole lot on 2019 as we focus on trying to execute what we believe will be an outstanding 2018. But I think there are a few dynamics that we've been wrestling with. As you know, over the last couple years, we've seen a gap between earnings and cash flow, and it's really been driven by a couple things. One, success, and by that, I mean accelerating rates of growth and the additional capital that goes along with that growth, both CapEx and inventory levels. So those have been one of the drivers. Secondly, we've brought on 10-nanometer equipment but haven't necessarily put it to use yet, so that's a cash driver without an impact on earnings. And third, memory is in the investment phase. So those three things have really been what's driving the gap.

And we've done a few things in light of that that you're aware of. One, memory, we engaged in the strategic supply agreements that you mentioned, which really for us is a sign that our customers are excited and committed to the technologies that we're building such that we can help - we can use their money to help fund the scaling of the business. And we think that's a good positive short, medium, and long-term move.

And the other thing, just if you think about, Stacy, how we guided this year, you have earnings. If you don't give us credit for the ICAP gains last year and strip that out, you see earnings growth. That's roughly 25% - 26%. And you see free cash flow growth that's in the mid-30s. So you'll start to see that gap narrowing as we go through the course of this year.

And then the other thing is we're going to make a fairly significant cash tax payment in 2018 as a result of the ICAP gains from last year, and that's roughly \$1.2 billion that's going to weigh on our cash flows this year. If you strip that out for a second, what you see during the course of 2018 is roughly 25% earnings growth and roughly 50% free cash flow growth. And that gap begins to narrow while we're accelerating the growth rate of the business.

So those are the dynamics in terms of how we're deploying capital for accelerating top line growth and the improvements on free cash flow relative to earnings per share this year. As we get through the course of 2018, we'll start to shed a little more light on what that means for 2019 later in the year.

**A - Mark H. Henninger** {BIO 17653227 <GO>}

Thanks for the question, Stacy.

**Q - Stacy Aaron Rasgon** {BIO 16423886 <GO>}

Thank you, guys.

**Operator**

Thank you. The next question comes from the line of Chris Danely with Citigroup. Your line is now open.

**Q - Christopher Brett Danely** {BIO 3509857 <GO>}

Hey. Thanks, guys. I guess another question on the manufacturing. Can you just talk about why the ramp in 10-nanometer or why the yields have been a little bit slower than expected? Have there been any changes in manufacturing? And then also, should we expect this to extend to future generations as well; i.e., a little bit slower than it had been in the past?

**A - Brian M. Krzanich** {BIO 4634082 <GO>}

Sure, so the issues around 10-nanometer, I'm trying to lay that flat out without getting too deep into the technology. But this is the last technology that doesn't incorporate EUV. And what you also need to understand is that we took very aggressive goals at 10 nanometers. So if you talk about the scaling factor or think about it as the multiple at which you shrink a feature, we took a target of 2.7. So you took any feature and run over 2.7 is the dimensional shrink that you did to this device. For example, on 14-nanometer, we took a target of 2.4, so you're almost 10% more aggressive on 10 nanometers.

And if you look at what is the industry standard, what the foundries and other players are typically doing, they're typically in that 1.5 to 2.0 range. So there, we're maybe 20% more aggressive. So it's very aggressive goals to hit our cost targets and where we want the technology to be. And that combined with the end of life of the immersion scanner before we hit EUV has just created something that's a little bit more difficult.

So that's why I have the confidence that this is not something we're shipping. The transistors work. We know the performance is in line. So it's really just about getting the defects and the costs in line to where we want.

As far as what does that imply for future technologies, we made a lot of changes at 7 nanometers. 7-nanometer currently is the first technology forecasted to implement EUV, so that immediately makes the lithography system different. We're going back to a more

standard, for us, compaction number of 2.4, so that makes it a little bit easier. We think we bit off a little too much in this case. And it may not seem like a lot, but 10% can make a lot of difference in this kind of a world.

And thirdly, we are using some very unique packaging technologies and such that allow us. At 7 nanometers and beyond, we're really moving to a world where you're not going to look at any piece of silicon as being a single node. You're going to use what we're going to call heterogeneous techniques that allow us to use silicon for multiple nodes. So you may use cores from 7 nanometers and IP from 14 nanometers and even as far back as 22 nanometers for the parts that don't need the high performance. And we're able to put those together and make them perform and behave like a single piece of silicon in the package. So really 7 nanometers is quite a bit different, and so I think as a result, we don't expect to see these kinds of impacts on 7 nanometers.

**Q - Christopher Brett Danely** {BIO 3509857 <GO>}

Great. For my follow-up, I know in the presentation, you mentioned that adjacency ramps will be responsible for some of the gross margins being down in Q2. Does that have any impact on gross margin for the rest of the year, or are you assuming that data center growth is going to slow down in the second half of the year, and that's another reason why the gross margin hasn't moved up, or is it entirely the 10-nanometer issue?

**A - Robert Holmes Swan** {BIO 1972621 <GO>}

No, it's maybe all three. First, we do expect the adjacencies throughout the course of the year to continue to grow faster than the rest of the business, if you will, so that will have a compression effect throughout the course of the year. Secondly, yes, 10-nanometer will be a headwind. And third, for data center growth, while we're expecting strong growth through the first half of the year, the second half of the year implied in our guidance is a deceleration.

If you put it in the context of the updated guide, we have data-centric growth going from mid-teens to higher teens. And you can attribute virtually all of that to DCG because obviously it's the biggest component. But we do expect there to be deceleration for DCG growth from first half to second half for sure. We hope we're wrong, but where we sit right now, we see the trends continuing into Q2. But we'll have tougher comps. We'll have tougher competition going into the second half. And we're going to wait to July to see how we see the trends we've experienced through the first four months of the year play out for the second half.

**Q - Christopher Brett Danely** {BIO 3509857 <GO>}

Great, thanks guys.

**A - Mark H. Henninger** {BIO 17653227 <GO>}

Thanks, Chris.

**Operator**

Thank you. And the next question comes from the line of Chris Caso with Raymond James. Your line is now open.

**Q - Chris Caso** {BIO 4815032 <GO>}

Yes, thanks for letting me ask a question. Just the first question is on CapEx that's been coming up a bit. If you could, talk a little bit about the incremental growth in CapEx, what that's associated with. And are there any CapEx effects associated with the changes in the ramp of 10-nanometer?

**A - Robert Holmes Swan** {BIO 1972621 <GO>}

Just the CapEx that we took up, \$0.5 billion is really a function of the incremental \$2.5 billion of revenue. So, Chris, when we came into the year, we guided a larger CapEx of roughly \$10.5 billion, and we had full-year revenue of \$65 billion. So we've taken \$65 billion up to \$67.5 billion. That's going to require roughly \$0.5 billion additional CapEx for the second half of the year and as we go into 2019. So it's the best I've ever felt about a CapEx increase. And it's a result of \$2.5 billion more revenue. And net the CapEx increase, as we indicated, we'll generate an additional \$1.5 billion of free cash flow as well.

**Q - Chris Caso** {BIO 4815032 <GO>}

All right, great. Thank you. And as a follow-up, perhaps you can give a bit more color on the expectations on memory as you go through the year. I know you talked about that being profitable and I think consistent with what you guys said last quarter. Have there been any changes in your outlook for the year? And if you could, talk a little bit about what's framed your expectations as you look through the year for memory.

**A - Robert Holmes Swan** {BIO 1972621 <GO>}

First, no real changes. As Brian mentioned, it's our first \$1 billion quarter in Q1. We feel good about the demand that we're seeing. Gigabyte demand is relatively strong. Our cost per gigabyte coming out of our Dalian fab continues to trend down. And at the same time, we see ASPs were down a bit.

But as we go through the rest of the year, we see demand and supply to be relatively well balanced. We are ramping Mod A (00:46:47) in Dalian, so that is in the early stages of the ramp. That's costing a little bit. But continued gigabyte demand, continuing to scale the Dalian fab, and continuing to come down - the cost per gigabyte curve are all contributing to what we believe will be a continued growth and profitability for the business for the full year.

**A - Brian M. Krzanich** {BIO 4634082 <GO>}

And maybe the only thing I'd add to that is, Bob mentioned it in his remarks. Our 64-tier product we also believe gives us really a leading-edge product and also very good costs relative to the market. So as we ramp that technology in Dalian, at 64 tiers, we believe our costs are very competitive relative to the rest of the market.

**Q - Chris Caso** {BIO 4815032 <GO>}

Great, thank you.

## Operator

Thank you. The next question comes from the line of John Pitzer with Credit Suisse. Your line is now open.

### Q - John William Pitzer {BIO 1541792 <GO>}

Yes, good afternoon, guys. Thanks for letting me ask the questions. Congratulations on the strong results. Brian, I think within DCG, the cloud hyperscale dynamics are well understood by investors. 90 days ago, I think what surprised everybody, probably including yourselves, was just the strength of enterprise in the December quarter. And I think when you reported December, you were reluctant to call that a trend, and you wanted to get some more data points.

I'm curious as to what the view of enterprise is now 90 days later. And specifically, a couple of your key software partners last year in Microsoft and VMware finally brought out their hybrid cloud software stack solution. And I'm wondering if that's actually been the driver of some of this pent-up demand in the enterprise. And how sustainable do you think it is?

### A - Brian M. Krzanich {BIO 4634082 <GO>}

Yeah. It's a great question, John. What I would tell you is clearly, as we look out into Q2, we're expecting the same kind of positive trends on enterprise for the second quarter. I think as we look at the long term, though, that trend that says enterprise should decline in that low single digits and it drives and helps fuel the growth of cloud, and that's not all of the driver of the growth of cloud, those workloads are moving over to the cloud base continue.

I think you're right. Products like Microsoft Azure and others where you can be a hybrid, Azure on-prem versus Azure in cloud, are great examples how – I think that low single digits is sustainable over the long haul, but I just don't see that trend. Again, I try and look at these businesses not over the quarter, or even within the quarter, or even one to two quarters, but really thinking about how am I going to invest over the next two to five years. I've got to look at that and say that trend is probably likely to continue.

Now for us, we also need to understand that those other segments of data center, the cloud and networking and comm, as I look at the Data Center Group, are now well over 50% of the revenue of that segment. So we are less and less impacted, I'll say, by the enterprise.

If you go back, when I started as CEO, enterprise was 60% – 70% of the business, and so we swung wildly by that. It's the other way around now, where the cloud and networking and storage are now that 60% to 70%, growing to the right, and enterprise is less and less. So the other thing you need to realize, John, is we're more driven by what that cloud is doing anyway.

**Q - John William Pitzer** {BIO 1541792 <GO>}

That's helpful. And as my follow-up to Bob, just a multipart question on the guide for Q2 and the full year. First, was the ASC 606 impact embedded in the original March quarter guidance? Is that the only quarter where you'll have an ASC 606 impact?

Second, is Wind River now out of the Q2 and full-year guide, or is that still in it? And how big is that business?

And then third, when you look at Q2 specifically, it just looks like the operating income beat seems a lot larger than the EPS beat. Is there anything going on below the line other than the tax rates that you guided to that can explain that? Thank you.

**A - Robert Holmes Swan** {BIO 1972621 <GO>}

Yes, great question. First on ASC 606 and what we expect for the full year, we had a strong benefit in the first quarter, and roughly half of that unwinds during the course of the year. So it contributed to growth in Q1. It will unwind itself throughout the course of the year. So full-year impact will be likely - at this stage of the game, we've got somewhere around \$200 million to \$250 million, but it unwinds through the next several quarters.

I think your second question, John, was Wind River. Our assumptions are that we will complete the sale of that business at the end of the second quarter. So it's in our second quarter guide, but it's a component of the first half to second half deceleration.

The third question, I think it relates to in the first quarter, we had good volume, operating margin flow-through to EPS. In the second quarter, the flow-through is not as rich. And the fundamental reason is we have some below-the-line charges associated with, A), the 2039 convertible securities that we have outstanding that have an exchange feature associated with them. And as people - as we hit a certain stock price, our holders can exercise that exchange feature. The implications are there is a non-cash charge associated with that, which goes through our interest and other line, that's negative.

The good aspect of it is, all else equal, it reduces our outstanding - our diluted shares, and we avoid a coupon going forward. But that will have - as more people exercise that exchange feature, we'll see that non-cash charge below the line. So that's causing a little bit of a drag on the operating income growth flowing through to EPS in Q2.

**Q - John William Pitzer** {BIO 1541792 <GO>}

Perfect. Thanks, guys. I appreciate it.

**A - Mark H. Henninger** {BIO 17653227 <GO>}

Thanks, John. And, operator, I think we have time for two more questioners.

**Operator**



Thank you. And our next question will come from the line of Timothy Arcuri from UBS. Your line is now open.

**Q - Timothy Arcuri** {BIO 3824613 <GO>}

Thank you. I actually had a two-part question on 10-nano. The issues seemed to be going on now for some time, and it's almost as if the design libraries or something are flawed. So I guess the first question is why not skip 10-nanometer and go directly to 7-nanometer? You guys have a lot of EUV experience and it's going to cut out a lot of the multi-pattern layers. So that's the first question.

And number two, the real question is that if you did that, would that be a net drag to gross margin looking out because you never really monetized 10-nanometer? Thanks.

**A - Brian M. Krzanich** {BIO 4634082 <GO>}

Okay, so let me try and answer your question. No, there's nothing wrong with the design libraries or anything like that. The proof of that is that we're shipping product. So if there were basic functionality issues like that, you wouldn't be able to produce and ship the product. Again, as I said, this is all around how many layers are on multi-patterning and the end of life of the immersion for the critical layers.

The second part of your question was would it benefit to just skip to 7 nanometers, and would that have an effect on the capital or the gross margins? The simple answer is no. I don't think that's a good idea. The best answer is there's a lot of learning that will happen that we can carry forward into 7 nanometers just like we carried from 14-nanometer to 10-nanometer.

The other thing is that we still hold - roughly 80% of our capital equipment is fungible to the next node or backwards to the prior node. And so that's why as we've shifted 10-nanometer and 14-nanometer, we were able to do that without shifting our capital expenditures greatly from - we're able to just move the capacity back and forth. The same thing is going to happen between 10-nanometer and 7-nanometer. So you'll have some percentage, and it's always based on demand and how fast things are ramping and all of that. But the equipment will be fungible for the most part between 10-nanometer and 7-nanometer as well.

But no, the right thing to do is exactly what we're doing. This is a unique opportunity we have. There's a lot more performance than 14-nanometer. We can keep driving that. We'll fix the yield issues. If 10-nanometer can have a 10-nanometer, a 10-plus, a 10-plus-plus, you're going to see a lot of products and a lot of performance out of that technology.

**Q - Timothy Arcuri** {BIO 3824613 <GO>}

Got it, Brian. Thank you.

**Operator**

Thank you. The next question comes from the line of Romit Shah with Nomura Instinet. Your line is now open.

**Q - Romit Jitendra Shah {BIO 16865852 <GO>}**

Thank you and congratulations. Brian, I wanted to ask you about China. Your filings indicate that mainland China was about 20-plus percent of revenue in 2017. And I have two questions. One, does that figure represent your exposure to the domestic vendors in China? And I guess just in light of the current environment between the U.S. and China, there are reports now of a potential ban beyond ZTE. How concerned are you as it relates to the impact to Intel?

**A - Brian M. Krzanich {BIO 4634082 <GO>}**

That number is much broader, so that would be, if you think about it, so everything from shipments into companies like ZTE or Huawei that are more domestically oriented, although Huawei ships around the world now. It goes to Lenovo and companies like that, Spreadtrum, all of those companies now. If you look at Chinese companies, very few are holding within just China. They're almost all shipping products and selling across the world. So the number is really representative of all of the companies that are building within China.

Our view is that China is an important market, as you just described, 20-something-plus percent. It's one of our fastest growing segments as well. It's important to us, and we're counting on our leaders and the leaders of the world to go resolve these issues. We believe in fair trade. We believe that countries and companies need to be able to play in markets fairly and compete, and we're counting on this getting worked out. That's very important to us.

**Q - Romit Jitendra Shah {BIO 16865852 <GO>}**

Okay, great. Thanks for that. And then, Bob, I'm sure you'll shed more light on longer-term spending targets. But as we build our models for 2019, do you think it's reasonable to assume that you can drive additional operating leverage beyond 2018?

**A - Robert Holmes Swan {BIO 1972621 <GO>}**

You're right. I will shed more light on that later. No, but I think look, the trends that you've seen over the last couple years is how we framed things back at our Analyst Day early last year, I guess. And that is that we're going to see an expanded TAM, and with that expanded TAM, accelerating growth in areas that have lower gross margins, and that we expect over time that there will be a modest degradation in gross margins as a result of growing earnings in different segments. But at the same time, we've said that that gross margin modest erosion we believe will be offset by continued – both continuing to invest in the critical priorities, but getting leverage on our existing spending base.

So with that, I think you're going to have a natural offset. We're two years ahead of our targets to get to 30%. We're excited about the accelerating growth of the company. And we do believe that as we continue to accelerate growth and invest in key priorities that our leverage on spending continue to come down.

**Q - Romit Jitendra Shah** {BIO 16865852 <GO>}

Great, thank you.

**A - Mark H. Henninger** {BIO 17653227 <GO>}

Thanks, Romit, and thank you all for joining us. Operator, please go ahead and wrap up the call.

**Operator**

Thank you. Ladies and gentlemen, this does conclude today's conference. You may all disconnect. Everyone, have a great day.

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