Company Name: Broadcom
Company Ticker: AVGO US
Date: 2018-06-07
Event Description: Q2 2018 Earnings Call

Market Cap: 125,245.57
Current PX: 316.40
YTD Change($): +62.12
YTD Change(%): +24.430

Bloomberg Estimates - EPS
Current Quarter: 5.179
Current Year: 22.932
Bloomberg Estimates - Sales
Current Quarter: 5687.458
Current Year: 24406.481

Q2 2018 Earnings Call

Company Participants

- Ashish Saran
- Hock E. Tan
- Thomas H. Krause

Other Participants

- Ross C. Seymore
- Craig M. Hettenbach
- Ting Pong Gabriel Ho
- Blayne Curtis
- Amit Daryanani
- John William Pitzer
- Stacy Aaron Rasgon
- Vivek Arya
- Harlan Sur

MANAGEMENT DISCUSSION SECTION

Ashish Saran

GAAP and Non-GAAP Financial Measures

In addition to U.S. GAAP reporting, Broadcom reports certain financial measures on a non-GAAP basis

A reconciliation between GAAP and non-GAAP measures is included in the tables attached to today's press release

Comments made during today's call will primarily refer to our non-GAAP financial results

Hock E. Tan

Business Highlights

Gross Margin, EBITDA and FCF

- I am very pleased with our execution in Q2 FY2018
- We drove gross margin to 66.6%, EBITDA to 52.3%, and FCF to 42.3% of revenue, all record achievements for us and a continued demonstration of our robust business model
- We were also quite active in executing on our recently announced stock repurchase program
- Since the announcement over a six-week period through June 1, 2018, we have returned approximately $1.5B to stockholders by repurchasing more than 6.4mm shares, and we do intend to continue to be active

Net Revenue

- Consolidated net revenue for Q2 was $5.02B, just above the midpoint of guidance with strong wired and enterprise storage results offsetting weaker wireless revenue
- As a reminder, before I go on and give you more color into this quarter, Q2 FY2018 was a 13-week quarter, while the prior quarter, Q1, was a 14-week quarter
- Segment revenue comparisons reflect this, as I discuss performance by segment

Wired

- Starting with wired, in Q2, wired revenue was $2.3B, growing 9% year-on-year, 22% sequentially
- The wired segment represented 46% of our total revenue
- Second quarter wired results reflect a strong sequential increase in demand from cloud data centers and a seasonal recovery in broadband access
- Solid year-on-year growth was driven by robust increase in networking and compute offloading in cloud data centers and strong growth in spending by enterprise IT.
  - We also benefited from an increase in spending on broadband capacity expansion by service providers
- In contrast, however, spending on video access and in the China optical markets remain sluggish

ZTE

- Turning to Q3 FY2018, we expect growth in wired revenues to continue notwithstanding the ban on shipments to ZTE
- We expect demand to remain healthy from cloud data centers and enterprise IT while broadband access remains robust

Wireless

- Moving on to wireless
- In Q2, wireless revenue was $1.29B growing 13% year-on-year but declining 41% sequentially
- The wireless segment represented 26% of our total revenue
- Second quarter sequential decline wireless revenue was deeper than usual and shipments to our North American smartphone customers reduced sharply from the atypically exaggerated first quarter
- We did partially offset this decline from increase in our product shipments to our large Korean smartphone customers as they supported their new product launch

Customer Demand

- Looking ahead to third quarter, we expect to see the beginning of seasonal H2 ramp in demand from our large North American smartphone customers as they expand to transition to their next generation platform
- However, we expect this strength recovery – I will say this recovery to be offset by a decline in shipments to our large Korean customer

- As a result, we're expecting our overall wireless revenue to be flat, maybe even slightly decline on a sequential basis for Q3

Enterprise Storage

- Let me now turn to enterprise storage
- Second quarter 2018, enterprise storage revenue was $1.16B and represented 23% of our total revenue
  - This, of course, included a full quarter of contributions of over $400mm from the recently acquired Brocade Fibre Channel switch business

Acquisition

- As you may recall, we had completed the acquisition of this business early in our Q1 FY2018
- And as reported, Enterprise Storage segment revenue grew 63% year-on-year and 17% sequentially
- But if we exclude Brocade contribution, second quarter enterprise storage revenue would've shown stable year-on-year performance with strong growth from enterprise server and storage markets, partially offset by softer demand from the hard disk drive market

IP Sector

- For Q2, the overall sequential revenue growth was driven by broad strength from the enterprise IP sector
- Looking ahead to third quarter FY2018, we expect continuous spending in enterprise IT to drive sequential growth in the enterprise storage, and growth in cloud storage capacity will lead to a recovery in how this drives demand

Industrial

- Finally, our last segment, industrial
- In Q2, industrial segment revenue was $263mm growing 17% year-on-year, 5% sequentially
- The industrial segment represented 5% of our total revenue
- Refits continued to remain very strong with 20% year-on-year growth, and we expect this momentum to continue into Q3
- Notwithstanding the strength today, we expect annual industrial revenue growth, however, to be in the mid-single digit range on a long term basis

Summary

So in summary, our overall business remains robust and stable

Our third quarter FY2018 outlook reflects this with a consolidated revenue forecast of $5.05B at the midpoint as we experience continued strength in wired and enterprise storage, benefiting from a very robust cloud data center and enterprise IT spending environment

Revenue Growth

- Year on year, our revenue growth has remained very sustainable
- Even without contributions from Brocade
- Organic revenue growth for Q2 would have been in the high-single digits
- And for Q3, we foresee this year-on-year organic revenue growth to modulate towards our long-term target of mid-single digits
- We will continue to keep a consistent focus on improving margins and increasing FCF from our business

Balance Sheet

- Our balance sheet continues to be strong with over $8B in cash at the end of Q2
- We also have $10.5B remaining on our stock repurchase authorization as of June 1
- And reflecting the very strong FCF generation we expect during the balance of FY2018, we plan to continue to aggressively repurchase our shares as long as we believe that we can generate superior returns in doing so

Thomas H. Krause

Financial Highlights

GAAP and Non-GAAP Financial Measures

- My comments today will focus primarily on our non-GAAP results from continuing operations unless otherwise specifically noted
- A reconciliation of our GAAP and non-GAAP data is included in the earnings release issued today and is also available on our website at broadcom.com

Net Revenue

- Let me quickly summarize our results for Q2 FY2018
- Second quarter net revenue was $5.02B in line with guidance
- Our second quarter gross margin from continuing operations was 66.6%, 60BPS above the midpoint of guidance
- We did benefit from a more favorable product mix in the quarter driven by higher-than-expected revenue from our wired segment and lower-than-expected revenue from our wireless segment

Operating Income, Adjusted EBITDA and DSO

- Operating income from continuing operations for the quarter was $2.46B and represented 48.9% of revenue
- Adjusted EBITDA for the quarter was $2.63B and represented 52.3% of revenue
- Our DSO were 50 days, a five-day increase from the prior quarter, as we saw a reduction in linearity of revenue across the quarter
- Our inventory at the end of Q2 was $1.26B, a decrease of $56mm from the prior quarter
- Days on hand remained flat from the prior quarter at 67 days

Cash Flow

- We generated $2.31B in operational cash flow, which reflected the impact of $117mm of cash expended on acquisition and restructuring-related activities, including Qualcomm and Brocade
- Please also note that we did not make any interest payments in Q2, as these are made on a biannual basis in the first and third quarters of our FY.

CapEx and FCF

- CapEx in Q2 was $189mm or 3.8% of net revenue
- As a housekeeping matter, I would also note that CapEx was $61mm higher than depreciation
- FCF, which we define as operating cash flow less CapEx, in Q2 was $2.12B or 42.3% of net revenue and reflects the impact of acquisition and restructuring expenses

Share Repurchasing

- On the buyback, just to give you some more clarity, in Q2 we spent $347mm on repurchasing 1.5mm shares
- These repurchases took place over the last two weeks of the quarter
- Over the first four weeks of Q3, we have spent an additional $1.16B, repurchasing 4.9mm shares
  - In addition, we returned $766mm in the form of dividends and distributions in Q2
- Turning to our balance sheet, we increased our cash balance by $1.1B through Q2 and ended the period with $8.2B in cash and $17.6B in total debt

Guidance

Non-GAAP

- Now let me turn to our non-GAAP guidance for Q3 FY2018
- This guidance reflects our current assessment of business conditions and we do not intend to update this guidance
  - This guidance is for results from continuing operations only

Net Revenue, Gross Margin and Operating Expenses

- Net revenue is expected to be $5.05B +/- $75mm
- Gross margin is expected to be 66.5% +/- 1 percentage point
- Operating expenses are estimated to be approximately $882mm
- The tax provision is forecasted to be approximately 7%
- Net interest expense and other is expected to be approximately $115mm
- The diluted share count forecast is for 457mm shares, and it does not include the impact from any share repurchases done after June 1, 2018
- Stock-based compensation expense will be approximately $320mm

- CapEx will be approximately $125mm

U.S. Corporate Tax Reform

- As you may recall, in connection with redomiciling to the United States and as a result of the effects of U.S. corporate tax reform, we had initially expected our effective cash tax rate on a steady state basis to be in the range of 9% to 11% per year
- Following the redomiciliation, we currently expect our cash tax rate for the balance of FY2018 to be approximately 7% and our long-term cash tax rate to remain in the 9% to 11% range

QUESTION AND ANSWER SECTION

<Q - Ross C. Seymore>: I wanted to start off on the wired side. Hock, last quarter there was a lot of debate about why the y-over-y growth slowed so much, and you guided for a confident sequential growth, which you just delivered. Talk a little bit about the visibility going forward. What's driving the slight growth that you're guiding to in the fiscal third quarter, and can you still hit the mid-single digit growth for the FY in that wired segment?

<A - Hock E. Tan>: The wired segment falls, especially the networking part of it, that we have very good visibility right now and it's largely driven, as I indicated in my prepared remarks, from the big cloud data center guys. What we also see, and that's probably less visible, is very strong spending patterns and enterprise. I call that enterprise IT environment, the more traditional enterprise. Those guys have also been spending. So when you combine the two together, that portion of our wired infrastructure business as it relates to networking broadly, as we describe it, is very strong.

And of course, as an aside, a separate segment we call enterprise storage, benefits gets drafted along with that. So that's why we see very strong business in what storage might call near line or what I call data center storage business, very, very strong both of them. And that's very visible in many of these situations because the cloud data center guys tend to spend in a lumpy manner. And so you get visibility as opposed to a more secular or trended manner as the enterprise IT guys are doing. So to answer your question, bottom line that will drive our wired business to hit to our goal of a mid-single-digit year-on-year growth for this year.

<Q - Ross C. Seymore>: Perfect. And I guess as my follow-up, switching gears on to the wireless side of things, it's good to see that your big North American business is starting to turn up and that the business as a whole has stabilized. Can you just talk about whether via content or the unit side, how you think about seasonality in the back half of the year given that there are so many different moving parts of content per SKU and what different customers are doing?

<A - Hock E. Tan>: There are a lot of moving parts. It's easier to look at it on a total basis and the second total basis, and also there are unusual factors which we all thought would happen in that as we move from iPhone 8 to iPhone 9 generation coming up, there is some caution in the level of build. And there is. We believe there is. But having said that, we're also seeing orders coming in in what I call in a normal seasonal pattern of strength. And we do see that very clearly now and we do see bookings that extend all the way to close to the end of this CY from these North-American customers.

So we see back – and what is fit exactly back to – trend to be normal patterns. The difference is what's the mix of the new generation phones vs. legacy phones, and that's what might lead to some uncertainty of how much content changes or increases that might be. And very frankly, visibility is not as clear because it's hard to predict at what level or what will the mix of new generation phones vs. legacy generation phones would be.

<Q - Craig M. Hettenbach>: Hock, this is more of a strategic question of how you view the business. So some of the pushback on the companies that you've been so acquisitive that feeling that there's a need to do more M&A. So just two things on that, number one, with the current makeup of the business, can you talk about the long-term growth profile as you see it? And then the second part would be now that you're buying back stock, your view of the opportunities to do M&A vs. return cash through buybacks.

<A - Hock E. Tan>: Well, very interesting question on it. And in terms of long-term growth of this company and the various franchise businesses that comprise our entire business and company, we have always said – and there are no reason to change that at all, to say that long term that we will achieve on a long-term basis, if you look over an extended period of time, an average compounded growth rate of mid-single digits. No reason for us to change. The business model continues to demonstrate that.

And we do not see anything that makes us think otherwise. Year-to-year as we have seen, you may see variations from that mid-single digit. We saw that 2017 as it compares to 2016. We saw strong organic growth stripping out the acquisition, their contribution from acquisitions. We saw close to mid-double digit, mid-teens year-on-year growth in 2017.

We are in 2018 and I don't expect that mid-teen rate of growth to continue. As I said, it's one year, but it is still above in 2018 mid-single digits definitely. We expect it to moderate down to perhaps high-single digits conservative. And we expect that, but that's to be expected, you cannot expect the kind of breadth of our business in connectivity solutions largely and our major market position within connectivity solutions, especially in those markets where franchise products prevail to keep growing higher than the rate of growth of the entire semiconductor industry, not counting memories. There's no way. It has to modulate down, as I've said before, to a level which is closer to the growth of the entire industry. We have to follow that. And the only variation to that whole thing as we think through this is simply that every – is that like all technology business, every new generation, every time a new generation pops up, and it varies in product life cycle from handsets which is 18 months to storage which may be five, six years, to industrial which may be even longer. That each new generation brings increased content so we have a kicker above GDP growth rates. It's always why I say that. Hence, we end up with mid-single digits on a global basis. And we will see that long term. Even as in the short term, we see variations and we saw that in 2017, we are seeing in the 2018. But as well and inevitably you measure it over a long enough period, get down to that mid-single digits.

<Q - Craig M. Hettenbach>: Got it. And then just as a second part of that question around how you're evaluating kind of M&A opportunities vs. the aggressive step you're taking on the buyback?

<A - Hock E. Tan>: Oh, we keep doing both, as we do basically based on return on investment as we generate cash. One of the things we are seeing is our cash flow generation, as Tom indicated in his remarks, and especially last quarter, indeed last quarter is not an unusual quarter. And as we forecast going forward is our cash flow generation is very, very strong. Our FCF was north of $2B last quarter and a big part of it relates to the fact that CapEx, which has been a big consumption of our cash flow over the last two years at least, between building up capacity and building up campuses in a couple of locations alike which involves big amount of money for operating cost reduction purposes, but nonetheless [indiscernible] (00:26:42) CapEx has dramatically dropped as we finished those programs.

And then something we are looking towards CapEx level much lower than we have seen in prior years, in prior quarters. So that's enabling our cash generation to be fairly substantial, on a quarterly basis, probably north of $2B FCF. So that's allowing us a lot more flexibility which allows us to still look at M&A as we do and still be able to invest that very strong stream of cash generation in a very good return-generating asset, our own shares, which is fairly simple. Think about it, all right? Our share is producing – we're generating over $8B. In the company, our market cap, we're the talking over 8% cash-on-cash return. It's not bad and it's our own shares. So of course we will keep doing that especially with the flexibility of generating a lot of cash. But that doesn't mean we stop doing M&A. We are continuing to look and we go by the criteria we have on cash-on-cash return. And as we see opportunities as we still do, we will act on those M&A opportunities.

<Q - Ting Pong Gabriel Ho>: I think this question for Hock. On the wireless, the guidance seems to be implying a flattish on a y-over-y basis in terms of growth for the fiscal third quarter. So my understanding is last year the phone bill at your large smartphone OEM customer was later than normal, so why is your wireless revenue not growing and is it due to the content or more of the unit?

<A - Hock E. Tan>: It's hard to measure quarter-on-quarter for various reasons. In my remarks, I was very clear, at this time last year third quarter, we had both the North American smartphone maker and the Korean high-end phone maker going in the same direction. We're not – while we are still very positive on the North American phone maker, we are not seeing strength in the Korean phone maker. As I said in my prepared remarks, that's the reason we are seeing that difference, the major reason we are seeing the difference.

<Q - Ting Pong Gabriel Ho>: Thanks. As a follow-up on the revenue side, you talk about operating leverage, talk about revenue growth moderating towards a mid-single digit, and how should we think about your OpEx front as well as your gross margin longer term?

<A - Thomas H. Krause>: So if I understood your question correctly, talking about the operating leverage in the model going forward. I think if you look at the operating expenses, they've effectively flattened out here at these levels. We might see them come down a bit, especially as we look into 2019. But to fair level, we don't see expenses increasing from here much. And we obviously think we still have a lot of leverage from a gross margin standpoint and continue to see gross margins expand, but the trend you've seen over the last several years, we don't see that stopping anytime soon.

And so when you put that together, we believe that we've got a lot of capacity to continue to improve our operating margins. And as Hock talked about, CapEx is coming down. I mean, this is largely a fabulous company, a CapEx light company when you look at the fundamentals. And so we're driving CapEx down to more like $100mm a quarter which suggests you're going to be running much closer to 2% as a percentage of revenue. And so FCF margins which we have a target of 40%, we think that can continue to improve and likely to improve obviously north of 40% if you do that math.

<Q - Blayne Curtis>: I just want to ask on the guidance. I wanted to make sure. It sounded like all the segments more or less would be up, but then you said not to mention ZTE, so I'm just curious how much of an impact that would be. And then secondly on just wireless, I just wanted to understand. Obviously, it's harder to triangulate average content. Legacy is one portion, but there's also the shared portion. I'm just wondering if you can comment on your visibility of your share at the North American customer? Thanks.

<A - Hock E. Tan>: We don't really like to talk about share on that because in the overall scheme of things, Blayne, it makes no difference to us. It might make a big difference to somebody else, which I won't mention. But in the overall scheme of things, we look at our business as 20 product divisions, four different segments. Some segments are up, some segments are down quarter-to-quarter. But overall, they are very, very stable and sustainable. I mean, broadly answered. So I really don't have that much to comment on in terms of share, and we really don't like to comment on share. [ph] I stand by that (00:32:28).

But in regards to your first part about ZTE, again, we're trying to be looking at it from a very high level. And until we have the ability to clearly ship out to ZTE, we really prefer that, again as we said, not to comment on it. Where we stand now is products are not shipping, and that's our position at this point.

<Q - Amit Daryanani>: I guess I have two as well. First, just on capital allocation, now that buybacks are part of your broader capital allocation, does the bar for M&A for deals for you essentially become higher because plan B would be assuming you buy your own stock, buying something at an 8% cash yield with no integration issues. So I'm curious, does the bar for deals become higher, or how do you look at the cash and cash targets today now that you have the option to do buybacks?

<A - Thomas H. Krause>: Look, I think Hock said it well, I'll just reiterate it maybe with a little more color. But basically, it's a returns-driven phenomenon. You can see our views on the returns of our buying back our own stock based on our execution of the buyback over the last month-plus, so I think that's self-evident. Going forward, as Hock said, we always look to drive double-digit returns from an M&A standpoint. Obviously, we think we know how to do integration, and so we'll take a risk-adjusted view of it. But as long as we think we can find opportunities that are well in excess of what we can buy our own stock at, we'll obviously take a very close look at that. But without that in mind, obviously, the stock over the last month-plus has looked attractive to us based on the stock that we bought back and continue to do so, as Hock said, given the returns.

<Q - Amit Daryanani>: Got it. And then if I could just follow up on the wireless segment, and I understand some of the near-term discussion we've been having on this. But as you think about the next several quarters in FY2019 on a broader level, do you think you're positioned to grow your wireless revenues in aggregate in FY2019 at this point, or are the compares going to be such that it's going to be hard to show growth next year in that business if units remain flat with your two largest customers there?

<A - Hock E. Tan>: We don't give outlook even beyond one quarter, much less the year. And frankly, we're not about to really change that practice or policy because then we'll be doing nothing but a lot of this in every earnings call. We'll give you our strategic view of the whole thing, and that hasn't changed. Again, we've got great franchises in every segment we're in, including especially wireless. And to ask me what one year looks like, we don't comment on that.

<Q - John William Pitzer>: Tom, congratulations on the strong quarter. Thanks for letting me ask a question. Hock, just maybe I'll ask the wireless question a little bit different. I understand the impact that mix might have as far as your revenue growth in the back half of the year. But as you think flagship to flagship at your North American customer, how should we think about content growth this time around and perhaps differentiate between RF and other applications? And I guess on the RF stack, we'll start to see some initial 5G modems coming out at the end of this year. I'm just wondering what kind of visibility you have for continued growth of FBAR as the world transitions from 4G to 5G?

<A - Hock E. Tan>: Strategically as we go to F5G and you go deeper and deeper into 5G, which runs what I call the ultra-high band frequency, maybe it's not so ultra-high, but nonetheless, when you talk about anything 3 gigahertz and beyond, you tend to push towards more and more FBAR content. That's a given. That's very well proven. That's very well-known.

Now when would 5G really come in and what fashion it will come in because the initial phones will likely be claimed to be 5G, but not truly 5G, so the specifications don't have to be as rigorous for performance. People will try to – phone makers may use, especially on the lower end, not higher end, use alternative SR filters and get away with it because performance doesn't matter, just the socket. But when you really get deeper and deeper into 5G, you need FBAR filters to make it work. So think of it long term, content will step up, no question, not only more frequencies but frequencies that demand the need for FBAR. Beyond that who knows? Go ahead. Go ahead.

<Q - John William Pitzer>: And then specifically as we think flagship to flagship this year for your North American customer, how do we think about your RF content growth and/or potential growth elsewhere with things like connectivity or touch?

<A - Hock E. Tan>: Things aren't, as you say, moving a lot. All we like to think about is how soon will normalcy in flagship phones recover – come back to what you call normalcy. We don't know. And how do you know what is content vs. unit volume, especially when normalcy is not there? I'm not trying to dodge your question, I'm saying you can't tell because right now shipments are not really normal, even as we see bookings coming in strongly, and hopefully we like to see normal. But then we don't see the North Korean customer being as strong as it should be.

<Q - Stacy Aaron Rasgon>: Let me ask that question a different way. So I know last year around this time you gave us a number for content. You said that at your North American customer was up 40%. Obviously, that may have changed a bit given the mix and it sounds like you're suggesting mix going forward of new phones vs. legacy is an unknown. But if the mix, I guess, in the 2019 was the same as what we saw this year, what do you think your content at your North American customer would be? That should be a math problem you ought to be able to do.

<A - Hock E. Tan>: But even though I tell you, how are you going to check it against revenues? Which is why...

<Q - Stacy Aaron Rasgon>: Well, we'll see.

<A - Hock E. Tan>: [indiscernible] (00:39:56) is most important. Because a legacy phone will vary. If the mix of legacy phones starts increasing dramatically, you will reflect on the different set of content. What you're asking is, what's the – it's not really what's that content. What's the revenue over the next few quarters? What it's going to look like? And based on trying to do simple math on content. If I say you have an unknown equation which says the legacy phones may increase in percentage, we then dilute any increase in content and then the...

<Q - Stacy Aaron Rasgon>: So would it...

<A - Hock E. Tan>: ...revenue won't reflect what you're looking for. I'm basically trying to answer your question for you by saying that if you're looking for what else on a simple correlation between content increase and revenue change, I'm saying there are other factors that are coming in that might dilute that whole equation. And so answering that question that you asked in simple terms doesn't answer the underlying interest that you had. I will say in broad scope, content direction and trend hasn't changed at all but the mix of legacy, the mix of phone SKUs, and in some situations if you look beyond a North American OEM and look at other high-end smartphone makers which we sell to and their varying performance, all those skew your numbers.

<Q - Stacy Aaron Rasgon>: Okay. Okay. Let me ask a question historically.

<A - Hock E. Tan>: You know what I mean? Your math request is easy. And I'll tell you the math request is that the trend in content increase has not changed.

<Q - Stacy Aaron Rasgon>: Okay. So, you're still...

<A - Hock E. Tan>: But that doesn't tell you anything.

<Q - Stacy Aaron Rasgon>: Okay. But I mean your old long-term normalized outlook was for end market units to be relatively flat given call it premium phones aren't growing very much.

<A - Hock E. Tan>: Correct. Correct.

<Q - Stacy Aaron Rasgon>: But they have over the long term a mid-double-digit content increase. You're not changing that long-term point of view? By the way, that had nothing to do with mix. That was a portfolio point of view as I understand it. Are you still holding to that long-term portfolio view for content increase?

<A - Hock E. Tan>: Oh, yeah, there will be long-term content increase still and there will still be long-term content increase. I'm more interested to know that there's a mix change and there's a unit change now that we have all seen.

<Q - Stacy Aaron Rasgon>: Okay.

<A - Ashish Saran>: Stacy, do you have follow-up questions?

<Q - Stacy Aaron Rasgon>: I do. Let me ask about storage really, really quickly. So obviously that's growing well right now, and I think in conjunction with the networking portion of enterprise they've got similar drivers. I'd say storage historically has tended to be quite a bit more lumpy or so than the wired business, and it just rose 17% sequentially and it looks like on a mostly organic kind of quarter. I guess, how should we think about the drivers of that and I guess the lumpiness that may continue with that going forward? I think historically you've given, again, a longer term kind of view of that business overall was roughly flattish +/-, like how should we be thinking about the near-term drivers of that and how those may play out over the rest of the year?

<A - Hock E. Tan>: Okay. Let me correct some misperceptions there, but maybe it's our fault for not articulating it clearly enough. If you strip out Brocade – I was trying to say, as an add-on if you do a year-on-year comparison, you have to strip out Brocade from current year FY2018 results. Our revenue in enterprise storage year-on-year is single digits growth as you expect enterprise storage to typically happen. And this is a very stable kind of business, it doesn't do cartwheels. And it probably sounds like that, but it's very stable and extremely, extremely sticky and profitable. That's storage. And it will be.

And even on FY2018, we're seeing super strength, especially with near-line data core data center buying more high-capacity drives, hard drives. We will still grow maybe closer to high single digits year on year, which is unusual for enterprise storage. What perhaps confused the mix is we now add year-on-year comparison Brocade, and that leads it to that 17%. Otherwise, year on year, please don't expect double-digit growth on storage. At best, flattish to single digits is the norm for storage.

<Q - Stacy Aaron Rasgon>: Wasn't the 17% a sequential number, or am I remembering that wrong?

<A - Hock E. Tan>: Oh, yeah, it's probably some level of sequential. Now, you're right, that sequential – I'm trying to discourage you from looking at it sequentially. Look at it y-over-y, sorry.

<Q - Stacy Aaron Rasgon>: Okay, so you're saying roughly flattish y-over-y excluding Brocade. Okay. Thank you.

<A - Hock E. Tan>: Yes, roughly flattish year on year excluding Brocade.

<Q - Vivek Arya>: I also had two. So, Hock, the first one, I understand we don't want to talk about specific content. There does appear to be some more competition in high mid-band bands. Do you think that is just the desire for large customers just to have supply diversity, or do you think competition is catching up in technology? And if it's the latter, what are you doing to make sure that you're maintaining your competitive edge in bulk-based technologies?

<A - Hock E. Tan>: Okay, good question. In every product line franchise we have, and we have 20 of them, we are in the lead. That's the definition of why we call it franchise, and that's our business model that we think we are the lead. Whether we grow it organically ourselves or acquire and strengthen and sustain those, we're the number one in each of those segments. No different in wireless, be they in wireless, we sell most notably RF front-end FBAR filters, in other words, built into it, or Wi-Fi/Bluetooth combo chip, as we call it, wireless connectivity. Very much we're the number one and in the lead. And we always, having said that, have competition. The world is such you always have competitors, but we are always in the lead. And we always, as our key business model, continue to invest as we need to, to continue if not expand our lead.

And to answer your question, in RF front-end, which I assume that's what you're addressing rather than wireless connectivity or Wi-Fi/Bluetooth where nobody is even within range, in RF front-end, we are very much in the lead, and we have that lead now for many years, and we continue to invest to keep that lead. And it has not changed – believe me, it has not changed. The lead that we have been able to – architect and design those RF front-end components, which includes: blocks, a lot of it; FBAR filters, our key element of strength; and power amplifiers less so; and the normal switches and little components that add up to an RF front end.

But especially where it relates to FBAR, we're in the lead in architectural. We're the best at creating those RF front ends that enable high-end phones to deliver the kind of performance and bandwidth that they generate that you see around you. And we continue to make sure we are very much in the lead.

So in terms of your concern, that hasn't changed. The business hasn't changed. The franchise, to answer your question directly, is not at all in jeopardy. Maybe that's clear answer to all you guys out there. We do not see – and this is not trying to be cavalier or complacent. We're far from complacent in any one of our franchise businesses. We continue to remain in the lead and we ensure we continue to be in the lead as we look forward one generation, two generations. That hasn't changed. The franchise is not in jeopardy

<Q - Vivek Arya>: Got it. And as my follow-up, very strong performance on the gross margin side. I think, Tom, you were mentioning that you expect perhaps more upside. What's driving this upside? Is it just mix? Is it something else? And is there a way to quantify what the longer-term opportunity is to take gross margins to? Thank you.

<A - Thomas H. Krause>: Good question. Obviously, it is mix as well. If you look at the growth Hock's been articulating around cloud and enterprise IT, we've added Brocade. These are all very margin-accretive activities. As revenue grows as well, we're seeing our businesses that were lower performing carried with it lower gross margins, some that we acquired from Broadcom in particular, continue to improve. As you know, it takes several years to go from actually designing in the product to shipping new products in volume. Some of the businesses we've owned for less than a couple of years. And so all those things as well as the day-to-day normal operating improvement is driving gross margins up. Clearly, we're focusing on value-accretive R&D, so we're spending nearly $3B in R&D. All of that is focused on delivering greater and greater value to the customer. That's also very gross margin accretive. So that gives us confidence that we can continue to improve it from these levels.

<A - Hock E. Tan>: And now that we have also – let me expand a bit on what Tom is saying also. Here's the thing. If you look at the strategy of this company and the product and the market characteristics and how we address the market, we pick those franchise products, and those products are strategic components typically of the customers in each of the end markets we address. And as I say, one of the things that's great about the technology business is it constantly evolves. I'm not using the word disrupt. I'm using the word evolution. It evolves.

It goes on switches, increases in bandwidth. The top-of-the-rack switch we're launching now is 12.8 terabit. Features a lot but uses less capacity. The routers we have, same situation. The third is we have out there to support our building block products and a bunch of other products we have gone from – has now reached a level of 102 gigabit per second.

As we go up higher and higher, the bar in challenging our product goes up correspondingly. I almost want to say – use the word, in many cases, exponentially. You have to spend the money to deliver those kind of very high technology products, and it gets harder and harder as generation progresses in every one of our products. Even a simple thing as PCI Express generation 3 going to generation 4, it's a huge challenge for most silicon guys out there. We can do it. So this is going from 25 gigabit to 56 gigabit to 112 gigabit as I said earlier.

We are finding less and less people out there able to come even close to what we do. And because of that, we're delivering higher content. When we increased bandwidth, which is a big part of what we do, higher bandwidth allows more data transfers, allows us to get better value for those products, and that's what drives the gross margin. All this is – the spending is mostly in R&D. The spending is not in making the product more – it's not in cost of manufacturing going up, it's more in the R&D spending to design and enable the product to come out. So it's normal that the gross margin goes up. It's also normal that the cost of doing R&D is stepping up, too, and there's something – we're very disciplined on how we make sure we get a good return. But really, the cost of manufacturing more and more sophisticated, higher-performance product, doesn't change and doesn't increase as fast as the value we add to our customers. And that's why you translate it to higher and higher gross margin.

The same applies in wireless to RF front-end, guys. I like to say that it's harder and harder, the value goes up, but the cost of manufacturing goes up less. And that's the explanation for why our gross margin has been trending or creeping up generation after generation, year after year.

<Q - Harlan Sur>: Your data center ASIC pipeline is very strong and I assume contributing to the strong year-over-your growth in wired, and our sense is that the pipeline is getting stronger and more diversified in terms of customers and product types, switching, routing, AI, Deep Learning, Smart NICs, and so on. And it does seem like more and more that the Cloud titans are trying to do their own silicon. Do you guys think that this is just a transitory phase and that merchant silicon will eventually fill this void, or do you get a sense that better silicon optimization via ASICs will be a sustainable trend? And I think this question also applies to your analog ASIC business as well.

<A - Hock E. Tan>: Very interesting question. And you know what the answer – I'd be direct with you. I don't know the final outcome and answer either. But we see strength today and looking forward to the next generation in both merchant silicon and ASIC implementations of the kind of products we do. We're both. And in fact, in many situations on large cloud guys who have the scale to ask for unique ASICs, some of those unique ASICs get their platform from our merchant silicon. And so it becomes like in many cases, it's – and now we are saying it's almost an ecosystem play. It's a whole fabric or network play. It's not one component by itself and we've seen that. And I would say both. Both merchant silicon is moving along very strongly, as is ASIC or semi-ASIC, semi-custom development.

And this is – when you say that the cloud guys want to do their own silicon, I'll rephrase this and say they can only do so much of the silicon. As you know, there's a whole spectrum when you do a silicon from right at the front end definition, architectural definition, chip definition to our front end design RTL all the way to the backend. And I've been trying – no cloud guys can cut across the entire spectrum, they'll do only parts of it. There's always room for a silicon supplier like us who are able to do across the entire spectrum and with $20B of revenues. Our scale enables us to not only do things better than most other supplies out there in silicon, but it also gets us to the scale of cost that is hard to manage and across a wide diversity of products. In other words, our cost of developing 7 nanometer spread across such a wide spectrum of products is very, very cost effective as the IP, intellectual property, we develop to support many of our unique products very low. And you see that in the kind of financial performance from articulated.

<Q - Harlan Sur>: Yeah. Thanks for the insights there, Hock. And then a question for Tom, you guys have a full quarter of Brocade under your wing. You were targeting $900mm in annualized EBITDA post synergies, there's 60% EBITDA margins, just given the company's total margin profile that you're driving right now, it seems like you guys are kind of already there but wanted to get your view. Can you just help us level set where you are relative to your target and how much more you think you can drive vs. the prior expectations?

<A - Thomas H. Krause>: Fair question. I think at this point we feel really good about Brocade. Obviously, revenues as a public company and everyone knows where the top line on SAN was. So revenues are strong and a lot of that is reflected in the storage business and the results there. In terms of margins, obviously it's a margin accretive deal, a lot of the cost on the OpEx side have come out, there's a little bit left to go but it's largely done. So if you do that math, obviously, this is a business that's meeting if not exceeding our expectations but I don't want to get any more detailed than that.

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