Wells Fargo Tech Transformation Summit

Company Participants

- Chris Eveden, Director IR

Other Participants

- David Wong, Analyst, Wells Fargo Securities
- Unidentified Participant, Analyst, Unknown

Presentation

David Wong {BIO 6109216 <GO>}

Okay. Great. Well we are very pleased to have Chris Eveden from NVIDIA come and chat with us a bit about NVIDIA today. Thanks very much Chris.

So perhaps we can start off by GPUs. I mean NVIDIA is a GPU company. It used to be you have nifty graphics in a desktop. But you've actually broader and quite considerably with what you've done with GPUs. Could you run through what you sell GPUs into these days and roughly the revenue breakouts?

Chris Eveden

Yes, sure. So we describe ourselves as a visual computing company, which reflects the fact that our core activity as you say is a GPU. And then we wrap it differently to take it into different markets. So we take it into the gaming market with graphics drivers. We'll wrap it in professional software drivers and that gives us our Quadro business, which is professional graphics.

We've built a whole ecosystem around power computing, with CUDA platform. And that gives us Tesla as a product. Then we built a hypervisor for the GPU as well. And that's where our new grid business is going to come from.

So all four of those businesses use the exact same piece of silicon, although there are different price points. There are different pieces of silicon for different price points. But the exact same piece of silicon. And the only difference is the value we put into the software and the ecosystem we put around it. So that's where those come from.

Then even with Tegra, what we have with Tegra now is we have the same GPU, again. But now wrapped in -- again, a whole bunch of software, an ecosystem. But also some silicon as well. And so now it's a system on chip and that's our Tegra business.

But it's all about leveraging the IP that we've got for our core competence, if you like, which is the GPU. And if you look at how much effort we put into that, we actually have more software engineers than hardware engineers. So although we are categorized -- you know you are semiconductor analyst, we are categorized as a semiconductor company, you can make a decent case for the fact that we are a software company that makes GPUs to run the software on.

So that's how we -- that's how the business is structured. But in terms of revenue, let me see if I can do it approximately in my head. So GeForce is around 60%, Quadro is around 20%, Tesla is around 5%, Tegra is around 15%. Where have I got to?

David Wong {BIO 6109216 <GO>}

We did get up to 100%. Do you want to get to 105%?

Chris Eveden

Probably, yes, because there's some other in there as well and then there's licensing and stuff like that as always. That's just there as a very broad rule of thumb. That's how I look at the business.

David Wong {BIO 6109216 <GO>}

Impressive. Within the 60% (multiple speakers) that's -- (multiple speakers)

Chris Eveden

Yes. We divide it into two markets. So GeForce is PC products for PC consumers. And we divide that market into two segments that we call gaming and OEM. It's a really -- we used to just think of it as being desktop and notebook, which was easy to do because we knew which chips were going into what form factor. But it wasn't actually very informative about the end market.

Gaming and OEM are actually almost the same because gaming is almost entirely desktop and OEM is almost entirely notebook. But they are not quite the same. There are gaming notebooks and there are OEM desktops. But it's also a much more informed way of looking at the market, because those segments have very different behavior.

So the gaming segment is very strong. It's growing at high single digits a year, probably the whole market as a whole. ASPs are very strong. It's the market -- someone is buying a PC to play games and so they have a specific need for that PC, whereas the OEM business is -- the OEMs are buying GPUs really to differentiate their PC within the marketplace.

No OEM wants to sell an entry-level notebook because you don't make any money on them. So they want to upsell you. One of the key up cells is the GPU. But that

whole market is under a lot of pressure right now because typically, the average consumer of a general-purpose PC is, for most tasks, better off with a tablet.

That is something Jen-Hsun's been saying for a couple of years. So that's seeing a lot of cannibalization. And there's a lot of price pressure in that market as well. And then there's competition from other features that might be used by laptop manufacturers to differentiate their products. So things like SSD's or touchscreens. These are expensive add-ons that might put pressure on the bottom.

But that is a market that we see as being in decline. But it's more than offset actually by the strength in gaming. The OEM market is characterized by a large number of units but low ASP and low gross margins as well. So low gross margin percentage. So when it comes to the proper contribution it's very much smaller than the gaming business.

Jeff Fisher talked about this at our analyst day last week. And if you actually -- so you can see some big swings occasionally in unit numbers that aren't reflected hardly at all in revenue. And not at all in profit. And that's because you've got this base of very low value high-volume notebook OEM parts that aren't generating very much profit at all.

So overall, we think that GeForce business is strong and at least flat year on year. And within that, it looks like the mix is going to get richer.

David Wong {BIO 6109216 <GO>}

Excellent. But just pushing that a bit. So gaming and OEMs. And as you said that it's the gaming that's primarily the profit. But if we think about revenues --?

Chris Eveden

About two-thirds, one-third; gaming is earlier. Yes.

David Wong {BIO 6109216 <GO>}

Okay great. You've begun to give us some of these numbers. But could you perhaps step through and give us what your view is of the growth potential? So you talked a bit about GeForce. And what about the professional graphics, Tesla, Tegra?

Chris Eveden

Right. So professional -- let me just stop and take a really high level and then I'll step through each one. So at a very high level, I see it as GeForce and Quadro are -- they are growing slowly, single-digit GDP. But they are generating an awful lot of cash. And that's cash that we are returning quite a lot of the cash to shareholders at the moment.

Tesla is a proven growth story now. So it's off a smaller base. But it's very profitable and it's growing very strongly.

GRID is an option on growth if you like. So there's a lot of excitement around GRID. But it's very early days. It is enterprise AT. So it's a two-year purchase cycle.

So it's really hard for us to say -- to give you -- we haven't got enough dots on the graph to draw a line between them right now. But it's certainly very, very promising in many ways.

Then Tegra, there are puts and takes in Tegra. So the automotive business is very strong, growing very strongly.

We have just withdrawn from the mainstream smartphone business. We are still in the high-end smartphone and tablets as well. So we'll see how that unfolds over the year. But that's how I look at it at a very high level.

So taking you into those businesses in a bit more detail within GeForce, the Quadro -- Quadro we have 82% market share according to IDC. That's units again and we think wallet share is more than 90% north of 90% dollar share. So really, to grow that business we had to grow the market and we have a bunch of initiatives in place to do so.

But I suspect that the dominant term in that equation going forward, at least for the coming year, is most likely to be the GDP. Specifically, manufacturing GDP, since 80% of our sales are generated by CAD through sales into CAD workstations. So Quadro for GTP-Plus.

Tesla, proven growth story. It grew 37% last year. It's really broken out. It was stable at about $100 million a year for a while. And that was -- but now we've broken out of that because we've added support for more codes and we've got a broader channel.

So let's give an example of that to illustrate what I mean. 1.5 years ago, to sell Tesla into something, our team of NVIDIA -- the NVIDIA team would have to go into a company, evangelize Tesla for a particular application. They would then have to port the code for the guys on the application. Then they would have to sell the hardware.

Now, hypothetical example -- so there is some research with Johnson & Johnson, who is looking at protein modeling and interactions between large molecules. He knows that his molecular dynamics code is accelerated by Tesla. He knows that IBM sells Tesla servers. So he phones up his IBM salesman and gets one delivered on Friday.

It's completely different. So now. So 1.5 years ago we knew all of our customers. And now there are many, many customers that we just don't know. And of course that's the way the business has to scale.

And IBM is -- I used IBM randomly. But they are particularly important partner because they have about 32%, according to IDC, of the worldwide installed base of supercomputers, which is more than twice as much as anybody else. So they build more supercomputer systems than anybody else.

But other important partners there are Supermicro, which is huge in that space; NEC, Cray, Dell, HP, pretty much the who's who of high-performance data centers. Computer data centers are working with Tesla now and supplying Tesla products.

And again, we support codes right across molecular dynamics codes, seismic codes, financial codes by modeling the Black-Scholes equation. Modeling derivatives pricing is actually something that ports very, very well for our hardware. So there's all sorts of application areas in it. So that's why we are growing really fast. That was Tesla.

Next one we did was GRID. GRID I described as an option on growth. So where we are with GRID -- so GRID -- let me differentiate because this one always causes confusion. Tesla is computer. So although we are using a GPU, we're not using it for graphics. We are using it to perform calculations.

A good example is Black-Scholes. Black-Scholes has nothing to do with graphics. It's about pricing derivatives or modeling plasmas or something like that.

But yes -- so, nothing to do with graphics. Now GRID is in the data center as well. But GRID is about graphics. So GRID is about serving up graphics power remotely and there's a bunch of ways we can monetize that.

The way we are looking at we're most excited about in the short term is by making virtual desktop environments better. So if you're familiar with Citrix and VMware, we can make the user experience better. We can make the user experience better and we can extend its application to 3-D applications as well.

So right now, if you install a virtual desktop environment, generally speaking, you'll be using a very old-style user interface, a Windows 95 type appearance. We can change that. We can bring it up to Windows 8.

We support video and we support 3-D. And when I say we support 3-D, I'm not just talking about those high-end Quadro type applications like Kfir. Even things like Autodesk, which is a very, very light 3-D application. So light in fact that of the 7 million installed seats worldwide, the majority of them are Intel-integrated. They're not even using a 3-D graphics card at all. But that's still too much 3-D for a virtual desktop infrastructure.

But by putting our card in there, you now support all the 3-D applications you want. So it makes more detailed nature, if you like on that. But from a high-level business perspective we have hundreds of trials running worldwide.

It's a two-year product cycle; bit early to say exactly where it's growing at. But there's a lot of excitement around that. Literally I think last time it came out to 466 trials at enterprises worldwide. So lots and lots of potential in that business.

Tegra. Tegra is the final one that we haven't talked about. Tegra is in a number of markets. The one that's most predictable is automotive. That's -- that grew very strongly last year. We expect that to grow very strongly again this year. And going on top of that, we do expect to have some tablet wins, some set-top box wins, possibly some high-end smartphone wins as well generating revenue this year.

David Wong {BIO 6109216 <GO>}

Actually, if we look at current revenues, let's say the most recent quarter or what you expected this year, when we look at Tegra, how does it roughly break out into those segments?

Chris Eveden

We haven't broken it out in detail. I think roughly, I think the only number we said publicly is roughly 40% of revenue was automotive last year.

David Wong {BIO 6109216 <GO>}

And automotive was actually becoming one of the biggest subsegments of tech growth. It already is one of the big (multiple speakers)

Chris Eveden

It is. It's a market for which visual computing is very important and actually increasing importance. If you look at advanced driver automation systems, we have some very strong differentiators there.

But even if you're just looking at infotainment, which is the traditional market we've been successful in, in automotive, the quality of those pixels is really starting to matter. It really affects your perception of the quality of the car.

You know, around of example from my own life; I was in Barcelona for Mobile World Congress in February and all the cabs there are Priuses and they have digital dashboard; no needles and dials, just pixels. And more recently I was luckily lucky enough to drive a friend's Tesla car and that has a digital dashboard as well.

But those are wholly different experiences, right? The Tesla one is clearly a dashboard inside a $100,000 car and the Prius one isn't. And that really brought it home to me how that -- how the quality of the pixels impinges on your -- affects your ability -- your impression of the quality of the car.

Another example is I was looking at a car a couple of years ago and it was a great car, a nice engine, beautiful leather seats, great stereo, sportive, handled really well and everything. But I couldn't get over the fact that the nav system was clearly badly translated from the Japanese. It tainted my whole experience with the car.

And so, I really believe that the experience you can bring graphically to the car is going to say as much about the quality of the car as hand-stitched leather and inlaid walnut used to say. And so that's differentiated and placed very heavily into our strength.

David Wong {BIO 6109216 <GO>}

Great. And I mean, thinking about all these various segments. And they are different applications, somewhat different products, can you talk about your different competitors? So you have got the one session GPU, a different one in Tesla.

Chris Eveden

So let's go through the list again. GeForce and Quadro, the competitor there is AMD. And we have about 2/3 market share in GeForce and about, as I said, over 4/5 share in Quadro.

So why is that? I think we have the best chips. But I also think in terms of the ecosystem and the drivers and all the other features we built around the chips, that really helps us hold onto that market and makes it stickier than it otherwise would be, because we give a better user experience. It really comes down to the quality of the user experience. And the ecosystem and the software we build is a huge part of that.

Specifically, here is a couple of examples. So one for GeForce. So our drivers are generally considered to be much better quality than AMD's drivers. And the driver is the layer of software that sits fits between our hardware and the operating system. And that has a huge impact on performance.

During the life of a graphics card, as we continually update the drivers, both things have huge impact. Then also, it's a question of putting features in and games that will only work on GeForce cards. So the game will be a better gaming experience on GeForce.

So PhysX for example is our physics simulation that runs on GPUs. So that's built into Unreal Engine 4. It's built into many games. It's going to appear in Titanfall, which is the biggest game of the moment right now. And you're going to see features based on that that improves the immersiveness in the whole gaming experience.

So that's how we differentiate with software. Quadro -- it's about performance as well. But it's also about stability and reliability. And we do an enormous amount of

qualifications with an enormous list of professional applications across an improbably large list of system configurations.

And that's because of -- an IT director does not want to have to waste time supporting products. They need that level of qualification and we give it to them. Actually our competitors, we have run down the list, haven't we? So that's the competition there.

So AMD has made a lot of noise about competition in both of those markets actually. In GeForce, you know there's a possibility that they can gain some share in the sort of low-end transactional OEM business. And so that might have an impact on a number of units. You might see that in market share numbers.

But how much impact it will actually have on revenue and how much it will have on profit, those are much smaller numbers, if at all. And I think if we continue growing our share in gaming, I think we'll increase our revenue and profit share, regardless of what happens with units.

Then on the workstation business, on Quadro, that is not a market that's driven by price. That's a market that's driven by quality and it's driven by performance, dependability and stability. If you think about our typical CAD workstation it's a $10,000 -- $5000 or $10,000 workstation. There is $20,000 worth of software on that. Then you got however much you are engineer costs say $200,000 a year or whatever $400,000 a year, whatever the number is.

So if you're selling a competitor to our $4000 graphics card at $3000, it doesn't matter. That doesn't help you, doesn't get you anywhere. You need a better product. I'm not really concerned with that market, either.

Go down the list -- GRID; sorry, Tesla -- the only competitor in Tesla well, there's two competitors and they are both Intel. So when we entered that market, there was no alternative. If you wanted to do high-performance parallel computing, currently you were running on an enormous number of CPUs was the answer you give.

Since then, Intel has launched the Xeon 5. When they first launched Xeon 5, they launched it as a graphics card. And we always said 116 is a graphics card. But they might be branded as a Tesla competitor at some point and that's exactly what happened. Larrabee is dead. Long live the Xeon 5. It's the same technology.

So that, we expected. And that's actually helped us in a perverse way because of who are competitor was, which was your traditional Xeon CPU. And so, the challenge that we always had to overcome was inertia.

We would go into a potential customer and we would say hey, look at all the great things you can do with our power processing -- much more performance per watt, much more raw performance, better deal for you. And some of them would reject it

and say well if I wait until next year, Intel is going to come out with a much better CPU and everything is just going to get better automatically right? I wouldn't have to do anything. I won't have to do any of that code reporting you've warned me about. Everything will just get faster automatically.

Now that Intel is in that market as well, Intel is essentially saying the same thing as us, which is you're going to have to move to parallel at some point if you want to get more performance per watt. We are running out of performance per watt gains in Xeon. Moved to Xeon 5.

So then at that point, now it's a question of what do I get with Intel or do I go with NVIDIA? NVIDIA has got far more code ported to it already. NVIDIA's got this massive CUDA (Rico) system. It's training 20,000 people a year to program that hardware.

Intel hasn't got any code ported to it yet. To make this claim that code runs automatically on Xeon 5, that's only true in a loyalty sense, if you like. So code reported to Xeon 5, ordinary CPU code ported to Xeon 5 will run on Xeon 5.

But it will run more slowly than it ran on the CPU. So it's actually worse. So yes, the answer to the question will it run is yes. The answer to the question will anyone do it is actually no.

The programming model for Xeon 5 is actually very, very similar to the programming model for our Tesla products. It's basically see with extensions is essentially what it is. And compile it directly to help it compile a figure out which bits are going to be parallelized and which bits aren't.

So then we're the incumbent. Now Intel has a lot of money to throw at the problem and they'll certainly win some deals. But I would still anticipate -- it's a big market and I would anticipate Tesla continuing to grow strongly into that market.

Competitors -- so, Tegra the competitor really is Qualcomm. In automotive, the incumbents are Freescale and TI. But they are -- I don't know how capable they are going to be of moving up to the next generation of infotainment and certainly hate to ask.

Qualcomm has just started in that space. So it's got a lot to do in terms of making up lost ground in terms of software and tools and the ecosystem that we built around our chips. But truly they have resources and they're going to compete strongly there. But again, our visual computing expertise will be a strong differentiator, a strong differentiator already. And as we move to the next generation of advanced driver automation systems, ADAS, we'll have an even stronger differentiation because we're the only people who can do anything like that sort of image processing right now.

David Wong {BIO 6109216 <GO>}

Do we have any questions in the audience? Anybody?

Questions And Answers

A - Chris Eveden

Went a minute, we don't have any questions. That's just us.

Q - David Wong {BIO 6109216 <GO>}

Anyone?

A - Chris Eveden

Well you're going to have to think of some more questions. I could just talk.

Q - Unidentified Participant

Chris, what are some of, I guess, your assumptions on manufacturing technology availability in the future? And also, when do you plan to move to FinFETs?

A - Chris Eveden

So we have to be a bit more careful about what we say about our future manufacturing plans, because that's competitively sensitive information. So Moore's Law -- and Jen-Hsun talked about this last week. He said Moore's Law is slowing down or has slowed down. So you have to find other ways to innovate.

So innovations like NVLink, I think, was the specific one he was talking about when he -- which is a fast interconnect between CPUs and between GPUs as well, between CPU/GPU and GPU/GPU. That's one example of innovation.

We will move -- we will move to 20. We'll move to 16. Whether we'll go as hard and as fast as we typically have gone into new nodes is an open question. But we'll see how that unfolds.

Q - David Wong {BIO 6109216 <GO>}

Just to amplify on that. So just my favorite topic, gentlemen asked last week about your attitude to Intel of the past. Can you run through what NVIDIA is saying about you know --?

A - Chris Eveden

(Down be up). We look at them. I mean right now TSMC is the best at what they do. They have the best technology. They have the best commercial terms and they've been a fantastic, fantastic partner for us for many, many years.

We've used other suppliers the past and been badly burned. And that doesn't mean to say we are completely blind to the idea that actually having only one supplier

might seem to be a risk. You don't need an MBA to wonder aloud about that. So we do look at other vendors.

And we would absolutely be open to looking at Intel or Samsung or Global Foundries. And we do look at that quite closely and if one of those ever had a technology lead and had the right commercial terms, then we would very, very seriously consider them taking at least some of our production there.

But I think today TSMC is the best at what it does. And I can't imagine our relationship with TSMC as anything but stronger today than it was yesterday, thanks to announcements by AMD. But certainly that has got -- that's surely enough to strengthen our relationship with TSMC.

Q - David Wong {BIO 6109216 <GO>}

Any other questions? Anyone else?

Q - Unidentified Participant

Your relative success in automotive for Tegra versus smartphones or smaller display sizes, how -- why is that? Is it the size of display that just doesn't value what you have as much? Or are there other things there, power management or other things?

A - Chris Eveden

Certainly the bigger the screen, the more pixels you are driving and the more sophisticated the application you're driving through those screens, the more it falls into our bailiwick, if you like. But I think also the mainstream smartphone market is very cost-driven and having high levels of integration in that market is quite important.

And there's a very, very strong incumbent in that market with Qualcomm. And they have the motive. And they have the connectivity and they can integrate it all. And that makes it a difficult market for anyone else to break into. If the differentiating factor is primarily price, then it's going to be a difficult place for us to compete.

If the differentiating factor is visual experience, as you note, as it is in cars and as it is even in high-end smartphones and in tablets, then I think we have much better prospects in those markets. Does that answer your question? Cool.

Q - David Wong {BIO 6109216 <GO>}

Anyone else? I was wondering about your comments about smartphones. And you've exited mainstream smartphones. So where does that leave your baseband capabilities?

A - Chris Eveden

So we still need the baseband, if only for automotive. Connectivity is going to become increasingly important in all those markets. So we'll keep developing a

standalone baseband voice and data. We're not going to develop an integrated baseband application processor.

Q - David Wong {BIO 6109216 <GO>}

Okay.

A - Chris Eveden

Because that's a product that's only got one target market in mind which is mainstream smartphones.

Q - David Wong {BIO 6109216 <GO>}

Any other takers?

Q - Unidentified Participant

Chris, what do you see as your best embedded opportunities available for Tegra going forward?

A - Chris Eveden

Well automotive is the obvious one. And that's the predictable one paid. We have said that we have about -- a pipeline, if you like, of $2 billion worth of business over the next few years. So we've got visibility into that.

So if we just sat on our hands and didn't make any more new business calls, in five years time' or whatever the number is, I'm not saying five years specifically, we would have had $2 billion worth of revenue. Now clearly, we are not sitting on our hands. We're clearly trying to go out and sell to more and more companies. But that's a great, predictable, very significant revenue line.

Other embedded applications we are looking at, I suppose you'd count set-top boxes in that embedded application. So such like Apple TV, we think that a device like that, if you could add decent gaming to it as well, run Android but put decent games on it, then I think that would be a very compelling device, because you could sell it at a similar price but you'd have huge differentiation.

Am I moving my head around too much for the mic? Are we finished? All right. Okay. I'm talking. Sorry, I'll just finish that question because it's an interesting example there.

So I've got a Shield, right, for NVIDIA and I've got a portal running on that which is a Valve game. And it's a game I absolutely loved on the PC when it came out a few years ago and now it's running perfectly well on Shield. And so it will be available publicly soon.

And I was playing this last night and, if I can put that on a console I've now got a high-end -- I've got a real gaming console experience so, what, $100 or maybe $130.

Now you've got a high-end gaming console. Just extraordinary, right? It completely changes the game.

Just playing playing back TV, my Blu-ray player can do that. Right? I mean I'm not sure how much extra value you get from that. But add in that gaming capability and suddenly it becomes quite an interesting device.

And because it's open, because it's Android, you have access to the whole Android ecosystem. So I've got Portal running on my Shield. I've got Angry Birds running on my Shield. I've got a Facebook app running on my Shield. I've got FactSet running on my shield. So (multiple speakers)

Q - David Wong {BIO 6109216 <GO>}

FactSet running on your Shield?

A - Chris Eveden

I've got FactSet, because it's an Android app. So I've got it running on Shield, yes.

Q - David Wong {BIO 6109216 <GO>}

Maybe I need a Shield.

A - Chris Eveden

Should have come to our analyst day. We were giving them away for free there. We already talked about that, you and I.

Q - David Wong {BIO 6109216 <GO>}

Oh well. I think we are through the webcast time anyway. So I do appreciate you stopping by, Chris. It's always great to catch up on NVIDIA. Thank you very much.

A - Chris Eveden

Sure, thanks David. If anyone has any questions, I'm going to be here for a little while longer. So reach out and talk. Cool. Thank you.