Goldman Sachs Technology & Internet Conference

Company Participants

- Colette M. Kress, Executive VP & CFO

Other Participants

- Toshiya Hari, MD, Goldman Sachs Group Inc., Research Division
- Unidentified Participant, Analyst, Unknown

Presentation

Toshiya Hari {BIO 6770302 <GO>}

Okay. I think we're ready to get started. Thank you, all for coming this morning. I'm Toshiya Hari, I cover the semiconductor and semi cap equipment at Goldman Sachs. I'm very pleased to have Colette Kress, Chief Financial Officer from NVIDIA with us this morning. Colette, thank you for taking time out of your busy schedule.

Colette M. Kress {BIO 18297352 <GO>}

Sure.

Questions And Answers

Q - Toshiya Hari {BIO 6770302 <GO>}

I wanted to start off by recapping 2017. The year was clearly a phenomenal year for the company. I think all your businesses grew double digits, exceeded our estimates by some crazy number. So I was hoping you could go back and share some of the surprises from the year and some of the major accomplishments from -- for the company.

A - Colette M. Kress {BIO 18297352 <GO>}

Sure. So we finished our fiscal year and announced earnings last Thursday. It was a great year both in terms of our revenue for the company as well as accomplishments that we made from a technology standpoint in terms of establishing the great markets that we have in front of us. We closed the year at $9.7 billion, growing more than 40% year-over-year. There are 4 market platforms that we refer to, which is our gaming business, our pro visualization business, data center and automotive. And as we (discussed for) each group and grew more than double digits. In the case of our data center business, which many people follow quite closely, we reached almost $2 billion and grew 130% year-over-year. So extremely strong growth for all of these overall platforms.

It was a big year for our Volta platform. Our Volta platform (blended) with our data center and was announced at our GTC last May. But our probably greatest surprise and greatest accomplishment of the overall adoption of Volta was across the overall industry, starting with our CSTs and moving quite quickly both for internal use in terms of training. But also the capabilities of using it within the cloud. And you're seeing many cloud instances come up each day, using our overall Volta architecture. (But let's) not take away from our overall gaming business, which grew quite strong. Quite strong on our Pascal architecture that we've had in-market for more than 1.5 years, with tremendous success in terms of both keeping the hearts and minds of the overall gamers as well as bringing on new gamers into the overall market.

Our Pro Vis business has established itself in terms of the high-end market as well as design. A very important piece of transformation in pro visualization as we think about the use of AI or the use of virtual reality for much of the design that's taking place in the enterprise as well, which has started that business, now growing at double digits.

Our automotive business, also growing more than 10%, is really associated with our infotainment systems now. But probably the key highlight is the many announcements that we've made throughout the year in terms of our partnerships with so many of the auto manufacturers, start-ups, partners, Tier 1 in the automotive industry as we focus on self-driving cars.

So we're pleased in terms of the overall revenue growth that also comes through in terms of our overall gross margins. As you know, our business is not just about shipping overall chips. But it is about the best hardware. But also a full stack of software for many of these industries that we're doing. So we started off the year, there was a lot of concern in terms of the absence of our internal royalty, which was going to expire in our First Quarter, which it did. But what we ended up doing was still growing our overall gross margins more than 100 basis points, including what we had in terms of more than 130 basis points in the other direction from the absence of the Intel royalty. So growing more than 200 basis points in terms of our true operations is really showing the value of our platforms, that full stack in terms of what people are appreciating and we're able to see that in terms of the overall gross margins.

We invested in our business. We invested in our business, growing our OpEx nearly 20%. But also producing overall operating income and margin expansion. Our margins increased more than 500 basis points year-over-year. So I think we have a tremendously great model of a leveraged overall R&D team. What we mean by that leverage is we focus on one product. We focus on the GPU. We're able to build that in terms of the best-of-breed. But then also work on software stacks that take each one of those to a specific market. And that has benefited us well as we think about the overall investments that we did. So the overall profitability growth growing more than 60%, even more in terms of on the overall EPS line.

So in summary, a really solid year. Taking advantage of great, large market opportunities in front of us. We have a very fortunate thing in front of us that we're

not just concentrating on one large market. We have many large markets. Gaming, gaming is here. Tremendously healthy. We'll get to the point where maybe every person in the world is an overall gamer. And our platforms are best-of-breed and able to really fuel a lot of the gaming and the high-end gaming that we see right now with the high-production games that are coming out. Many of those that we saw through the holiday season as well as the overall content in those games which demand higher-end overall graphics. But additionally, the advancement of what we're seeing in terms of artificial intelligence, the use of a GPU for democratizing a lot of what we're seeing in terms of the first stages of AI, have a very large market in front of us. It's great to see our progress this year. But also the progress that we have and the opportunity going forward. Automotive and autonomous driving is just an extension of what we had seen in the data center and a very, very hard problem to solve using artificial intelligence to build self-driving cars in the future, whether those be Level 3, Level 4 or Level 5 going forward.

So we're excited. We're excited about the future.

Q - Toshiya Hari {BIO 6770302 <GO>}

Great. Thanks very much for that. Then I guess, I was hoping you could walk us through the business formation -- transformation that NVIDIA has gone through over the past five years. Since you joined the company, a lot has happened. Stock was at $15. We're here sitting today at $230; it's a completely different company. So if you can walk us through some of those changes and how the opportunities are different today relative to when you joined the company?

A - Colette M. Kress {BIO 18297352 <GO>}

Got it. So joining the company five years ago, the discussion was what we would have in terms of onstage today versus what we did in terms of (5 years), there's been a tremendous transformation. I actually feel we transform every day to take our (part) in terms of this market. Yes. We are not a brand-new company, 25 years in the making. But a lot of that was really based on a really strong core technology of GPU that was used even back then. But primarily for the overall PC platform. So five years really doesn't talk about the actual transformation. You have to actually go back a little bit farther. Yes. The PC platform was a great piece for us to start the importance of the overall processing capabilities. Graphics was essentially a great application to use the processing capability of the GPU. But what happened probably more than 10 to 12 years ago was the establishment of the programmability of that GPU and enabling that for many. Establishing CUDA. And establishing CUDA on several and all of our different GPUs available at the time, allowed us to build the overall developer base that we have today. The developer base has grown astronomically, exceeds more than 600,000 developers worldwide, which has established some of the successes that we have today, both in the data center as well as in Pro Vis or maybe even in terms of artificial intelligence and our future with autonomous driving. And the reason why is they find the use cases of a tremendous overall processors to solve many of these more challenging problems that have required so much data and so much processing put together. So yes, five years ago when we would be up here talking about the PC market, the PC market would be declining or would be flat and (our) concerns in terms of our attach rate. It's been a long time since we've had that question. And now we really, really talk about, what stage are

we at in terms of AI? How big is this going to be? When will that first self-driving car hit the freeway? How can we see that there? So a huge change. It's required the company to keep on its toes. I think the company is probably one of the most agile companies really focused on those leading-edge things and how they're changing and how we can evolve as a company to reach those market opportunities.

Q - Toshiya Hari {BIO 6770302 <GO>}

Great. Then I guess, I wanted to dive into some of the segments and start off with data center just given the focus that you guys have and being the focus that investors have as well. Clearly, a major growth driver for you today. Can you walk us through some of the individual subsegments within data center and how they performed over the past 12 months?

A - Colette M. Kress {BIO 18297352 <GO>}

Sure. So our data center business is essentially focused on 5 different businesses within it. The first one, probably a very good percentage of our overall business, is focused on AI training. AI training requires a significant amount of data and, through a process called deep learning, allows you to process that data not from writing software. But allowing to infer from that large set of overall data. That is still a very significant part of our business and started in the early stages with CSPs, hyperscale providers as well as they use that training both on applications internally as well as applications that you and I use from a consumer standpoint from the overall Internet. That business has continued to evolve and continued to grow. Our second key business that has emerged and emerged quite well in this last year is the cloud business. So not only using it on the overall applications with the hyperscales had or the research team. But serving it up for all of the different users out there in the enterprise and other researchers to get started quite quickly. Quite differently, the maybe -- infrastructures were built maybe 10 or 15 years ago, where you would self-build a cluster within your data center, it is allowing an ease of use of researchers, start-ups, as well as the entrants in terms of enterprise to use the cloud to get quickly started on AI and get quickly started on deep learning. There's many different use cases of those overall cloud instances. But the focus on creating the cloud instances has been a big piece of this last year. So I'd say sizing up quite well to the overall deep learning training that we're seeing with our first business. Our third business is focused on inferencing. Now inferencing takes to a different stage of AI, where the data is already trained and we're going to focus now on new incremental data coming in and processing that on a speed, usually referred to in a per second, an image per second, an instance per second, those types of cases. Super early stages at that business and using an overall GPU for that. Traditionally, this has been done and primarily done through CPU market. But you're getting more and more complexity in types of work that needs to be done, both analyzing video, for example, analyzing voice to where a GPU processor actually can be tremendously more beneficial. Super early stages in terms of this is a market. But we're going to continue to focus on it because it is such a future large market for us to overall capture. Our fourth market is high-performance computing. Not a new business, a business that we've probably been in for close to 15 years. Large supercomputers around the world. Very, very deep computational type of work being done in high-performance computing. And we have now established ourselves in terms of both the top supercomputers in the world, probably 1/5 of them; as well as the top 15

overall applications for high-performance computing using overall GPU acceleration. This has sped up this year as more are realizing the slowdown of Moore's Law, the slowdown of using a general CPU to improve performance time and time again. They are using something else to accelerate the overall performance of those supercomputing and the GPUs being more established. A little bit different than AI. But what you're seeing is terms of the conversion, a conversion to high-performance computing and AI together to where now you can take some things and infer using AI and then deep computational transactions also using in terms of the high-performance computing. We've had long design wins in that market that will likely continue. And that's been a really great part of our business this year. Our last business is really focused on AI and the edge, autonomous machines, what people are using not centrally in a data center. But machines and (PCs) going forward. Also a great opportunity if you think about both smart cities, if you think about autonomous vehicles; we're still going to have a significant amount of work in terms of putting those platforms there. So all of those are our different businesses within our data center today.

Q - Toshiya Hari {BIO 6770302 <GO>}

Okay. You mentioned there's (been early gains) with inferencing. But on the most recent call, I think Jensen talked about that opportunity. Can you help us understand how big that business is today within data center and how you view the opportunities there will be in the next, say, 12 to 24 months?

A - Colette M. Kress {BIO 18297352 <GO>}

Yes. So again, most of our business in data center today, the majority of it stems from training the cloud, high-performance computing. Inferencing is still in its early stages, a wide set of partners. And those that are overall (trailing), overall inferencing. We see inferencing occurring in many parts of the world, within the hyperscale applications as well. But it's still an early part of that business in terms of representative of our data center business.

Q - Toshiya Hari {BIO 6770302 <GO>}

Okay, understood. Then, I guess, in terms of the competitive landscape in data center. Clearly, given the growth potential, you have multiple competitors that are aggressively going after the market and you've got privates that are supposedly emerging sometime this year with their solutions as well. Can you remind us what the value proposition is from NVIDIA and how you differ from the competition?

A - Colette M. Kress {BIO 18297352 <GO>}

Sure. I mean, when you think about artificial intelligence, of course, there would be a lot of interest from around the world, those folks being interested in being a part of that. Long term, sure, there's going to be many different players in artificial intelligence. But we've simply come through with an overall focus, which focuses on enabling AI in as many different platforms and in many different places around the world, not focusing on any one framework, not focusing on any one hyperscale, not focusing on any one form of computing. Our ability is to create a software stack that enables all of that, that allows you a quick start in terms of working through a

significant amount of metalware. Not to be confused. But we will always have the best processor capable of handling a significant amount of data that is out there. But if we can democratize AI for as many different types of populations that are out there -- from researchers, from labs, from higher education to enterprises as well as the hyperscales without aligning to any single one platform is really where our focuses are. As things develop long term, there will probably be specialties within there. You see us looking to extend our work to certain industries, certain verticals where we will probably add more software to enable, for example, health care or more software to help in terms of the overall manufacturing arm and the use of AI in those. But really, we are to be available to almost any of the different types of platforms that are out there.

Q - Toshiya Hari {BIO 6770302 <GO>}

Then I guess, specifically from yesterday, we did get quite a few questions from investors about the Amazon announcement and the Google announcement as well. Can you perhaps address some of those issues as well?

A - Colette M. Kress {BIO 18297352 <GO>}

Sure. There has -- there's been a discussion about what people refer to as (custom service). Is it the time for customization? Do you see players looking for customization for very specific workloads? So nothing new essentially emerged yesterday. Google coming out with their GPU (2). Now they're allowing a beta version of that in the cloud is what we've seen. But our strategy still remains the same, focused on all of the different cloud providers, focused on all of the different frameworks and enabling. So nothing new in terms of that piece. Amazon, in the same way, just a chip for a single kind of device, not necessarily a large autonomous machine. Although we would probably be more focused on -- from more of a device and coming out with a chip specific for that.

Q - Toshiya Hari {BIO 6770302 <GO>}

Okay. that makes sense. Shifting gears a little bit. I wanted to ask a couple of questions about crypto, just given the focus there. On your call last week, you talked about that part of the business being a bigger percentage of your business in Q4 relative to Q3. I know it's really hard to gauge how big that business is. But can you help us understand the relative size and where you see that going over the next, say, (4) quarters?

A - Colette M. Kress {BIO 18297352 <GO>}

Sure. So that was -- probably an interesting part of this last year, of our fiscal 2018, is the emergence of (overhead) cryptocurrency, not necessarily brand new. Over several years ago, cryptocurrency popped up in terms of the bitcoin mining. But that had moved to overall ASICs for that to take place. Right now, the current currencies out there, using a GPU is very beneficial for the work that needs to be done there. Over the last couple of quarters, we've watched it quite closely. It has some very important market dynamics that were popping up, where you had professional miners starting to take place. But you also have a case where you have extra time and outside of gaming that people can also be mining. So we may have a dual

overall function in terms of what we're seeing, the use of GPUs on the consumer side. It's tough to gauge. It's extremely tough to gauge. If you think about what we are selling in terms of our GPUs, GPUs for gaming or GPUs for crypto are sold through the same -- adding card makers, are sold through the exact same channels. And in some cases, maybe the exact same customer, gaming part of the time as well as also mining. What we do understand probably from looking at the valuation of your overall gaming and what we believe is the amount of work that needs to be done, we do believe the market grew from the time in Q3 to the time in Q4. And that we can see. Being able to pinpoint it exactly is just not something that we have the capability to do because they may be doing dual. Probably what has evolved since a couple of quarters ago is a -- market dynamics is getting to critical mass. The critical mass of amounts that are happening in cryptocurrency is there. But it will probably be here as an underlying trend for some time. So carrying forward, yes, it will be there. Will it still be volatile? Absolutely.

Q - Toshiya Hari {BIO 6770302 <GO>}

Okay. Is there any way to manage for a potential decline in crypto pricing and some of the GPUs flooding the market? Or is it just too hard to manage that?

A - Colette M. Kress {BIO 18297352 <GO>}

At this stage, I'm not sure there is a path for that, given the volatility of just the overall coin. I'm sure we'll see additional coins in the future. So it's just too hard to tell at this point.

Q - Toshiya Hari {BIO 6770302 <GO>}

Okay, got it. Then, I guess, talking about your gaming business, which is still well north of 50% of your (inaudible). It gets little air time these days given data center and crypto. But in 2017, another very strong year. Was that mostly crypto or was it gaming as well? What drove the strength in 2017 and what's kind of the outlook into 2018?

A - Colette M. Kress {BIO 18297352 <GO>}

So our gaming business is still growing strong. We can definitely see that just because of the success that you see with a lot of the games that are coming out. PUBG is, for example, probably one of the best games of 2017 that came out. Started out early back in the fall. And late, has reached more than 25 million, 30 million different users. Those are gamers. Those are new gamers. Those are gamers that have moved to a new game. And to play that, they are continuing the upgrades of the overall Pascal cycle, thinking about our GPUs for that. So tremendous success. Towards this latter half of the fiscal year, though, a challenge because those same gamers and those same crypto miners were there. And at this point, we're supply constrained. Those GPUs are under a lot of need to meet a lot of different things. But yes, the overall success of gaming can clearly be seen both by the revenue growth that we have. But also if you just think of the overall success and the growth of the games that are out there. We can easily see that.

Q - Toshiya Hari {BIO 6770302 <GO>}

Great. Then from a competitive standpoint, you've clearly done really well in gaming over the past couple of years, gaming share up at the expense of your nearest competitor. Going forward, how do you view the landscape? Intel has talked about coming back -- they've got a discrete graphics business as well. So on a multiyear basis, how do you see the competitive positioning changing, if at all?

A - Colette M. Kress {BIO 18297352 <GO>}

Yes. So I think our focus on addressing gamers, just as the other company does, has their own unique strategy on how we address the overall gaming market. For many of our competitors, the thought of just a chip would establish an overall gaming platform is much differently than how we focus. We had focus in terms of surrounding the overall ecosystem of our overall gamers. But providing them GeForce experience, providing them the overall seamlessness of the GPU to overall playing their game. And remember, we're continuously working with many of those game developers to bring to life so many of those great features inside of the game. So those that are very graphic intensive, we are working hand-in-hand with them for many months before the game ever even comes out. So we have just a different approach in terms of befriending our overall gamers and having a very well-established channel that knows how to reach those overall gamers that influences our gamers coming back time and time again. They are the trusted value of both the best processing capabilities. But also the great seamlessness of understanding the overall gaming industry. So the competitors haven't changed much. They've been the same competitors for 20-some-odd years. But we have again influenced both the high-end types of gamers as well as the early entrants. Those early entrants are continuing to use NVIDIA because we had a product that meets all of those different needs, whether or not you have $100 to spend or whether or not you want the top-of-the-line $1,000 GPU for gaming, we have something there. So I think the competition will always be there. But again, it's a tough nut to crack. It's not something that just takes a couple of months to do. Our strategy is well ingrained of a system, of the ecosystem. And I think it's here to stay.

Q - Toshiya Hari {BIO 6770302 <GO>}

Okay. Great. We have about 8 minutes left. I still have a bunch of questions. I just wanted to make sure if we had any questions from the audience? There's one right there in the (seventh) row.

Q - Unidentified Participant

So I think you mentioned earlier last year that there was a different driver used for crypto mining versus normal gaming. And are you able to tell the difference between which GPUs were using -- used for crypto and which ones were used for mining -- sorry, for gaming? I think the latest crypto stuff, people have been using just the latest NVIDIA drivers so it's hard to differentiate, right? But I think the one thing they still do, is they overclock the memory. Are you able to figure out what percentage of GPUs you're selling are like memory overclock versus normal overclock?

A - Colette M. Kress {BIO 18297352 <GO>}

Okay. So let me -- for the room, we talked about last year. Yes. We brought to market a specific overall GPU card specifically for the cryptocurrency market. Those are captured not in our gaming business. But those are captured in our OEM business. And you can essentially see them in the overall OEM business. They differ because they also don't do graphics. They're really just there for overall computation. Yes. We are still selling those overall cards. But with the overall price increases that we had seen in cryptocurrency valuations within Q4, people bought those. But also moved to buy regular GPUs, which caused a significant amount of supply constraint just because you had them moving also into regular overall GPUs. Could be that they were planning to do both gaming and mining together. The second question was about the memory overclock and those types of things. Not something we can specifically see because remember, we still don't even have a perfect understanding of are you a pure miner, gamer? We can see a merge of that. But we don't necessarily have the overall data figures in terms of the overclocking. Overclocking is not something new. That's something that folks being experts along in terms of the gaming, use the GPUs to do that. We have overall (inaudible) that choose the best type of clocking for their overall games. But I'm sure they also may not -- possibly (not doing) cryptocurrency. But we're not sure.

Q - Toshiya Hari {BIO 6770302 <GO>}

Any other questions?

Q - Unidentified Participant

In terms of the process -- in terms of the product you have for the autonomous side, can you -- do you have a sense on when do you think Level 4, Level 5 autonomous, what's the time lines on that? And do you -- who do you see out of the automakers versus the intermediate companies being better ready -- who's better placed today to be ready for Level 4, Level 5?

A - Colette M. Kress {BIO 18297352 <GO>}

Okay, sure. We haven't had an opportunity to talk about auto. So this is a good opportunity. So we have our DRIVE PX platform. There's many different parts of our PX platform that we have for autonomous driving cars. The important piece that we want people to understand and probably transform the lot within this year is, one, earlier in the year, people really started to believe and understand that autonomous driving was not going to probably take place without AI; that it really, really was an AI problem, being able to process all of the data around the car in a nanosecond type in order to create a path for the overall car to function was going to be key. So what's also interesting is all the discussion regarding Level 3, Level 4 and Level 5. If you move in terms of Level 5, Level 5 essentially says there is no steering wheel, there is no brake pedal, there essentially is no driver. If we want to move all the way to Level 5, you go down it in a serial processing that says I'm going to get Level 3, then I'm going to add Level 4 and Level 5. Probably not. So we introduced our Pegasus platform within the year. The Pegasus platform is focused primarily at that Level 4 and Level 5, where you may do Level 5 in a confined type of community area, a several block radius, a college campus, a downtown area. That's an area that you could actually map quite heavily and you could actually bring your process to the market and remove the driver quite quickly and be functioning in that. So thinking

about bringing Level 5 that you need a car to drive from San Francisco to New York, probably not necessary today. But rather thinking about this (all in the coming days). Additionally, Level 3 moving from the advancements of high-end Level 2 and the overall safety features that in certain scenarios, you would be able to drive yourself, whether that be freeway driving, whether that be in parking lots to park your car, et cetera, we'll be here also probably more in the near term. So at the same time that we are likely to see robotaxis in certain communities as well as Level 3, they may be about the same time. We already have the Tesla cars on the road today, which are functioning with our overall platform. We've announced continued work, both with Audi, pilots in terms of Volvo as well as many different other robotaxis in terms of not just here in the U.S.. But also international in terms of those areas. You asked a discussion about who of the auto manufacturers are we thinking are most involved? Actually, all of them are in all different types of stages and different approaches in terms of how they want to address this market. Some of them really want to be a part of the shuttle, want to be a part of the robotaxis. Others would continue very similarly what they did with their high-end infotainment systems and creating high-end cars, which will be autonomous driving at that point. What is unique about this market versus what people put into cars in the years before, it's not about that same just start with the fleet of cars. You're talking about the transportation industry as a whole. This is affecting transportation as a service. As you see, our overall partnership with Uber, as it thinks about a fleet without a driver. This affects in terms of trucking and overall hauling materials across the country. How can we think about using AI in those scenarios to improve both the safety and the overall efficiency in terms of that market. It's not a U.S. market. There's a tremendous amount of work in China. Overall start-ups and car companies there. Also in terms of the Europeans in terms of having significant amounts of fleets and focus in terms of there. So this is probably again one of the largest transformations of transportation that we've seen in the last 100 years. But it's going to take different starts and different finishes just based on how quickly they can move this out for each of those areas.

Q - Toshiya Hari {BIO 6770302 <GO>}

Colette, I wanted to finish off by asking about your ability to expand margins going forward. You've done a great job growing gross margins, operating margins over the past several years. I personally think mix improvement alone would drive gross margins higher. But at the same time, you are expanding OpEx at a pretty fast rate. So how should we think about your ability to grow margin going forward?

A - Colette M. Kress {BIO 18297352 <GO>}

Yes. So the company's focused on -- really on higher-end value platforms. It's really the underlying machine regarding our overall profitability and our overall margin expansion. So it's interesting to focus on what we have. On the gross margin, what you see is both the cost of those platforms in terms of actual components. But the reality is the value in it is often the tremendous amount of work that our software engineers are doing, hardware engineers that create that full end-to-end platform. That work is in our overall OpEx. That work is a unified structure to where we can support multiple different platforms together and we can focus on one thing, (inaudible) to enable that. So that whole combination has allowed us both to grow the top line gross margins as people expand to these higher value-added platforms while also allowing us to think thoughtfully in terms of our investments that we have

in terms of OpEx. So the right measure is certainly our overall margins, our overall operating profit. We reached probably close to $3.5 billion in profit this year. And even in the Fourth Quarter, we expanded margins close to more than 40%. But we still have all those same tools in front of us as we go forward as focusing on the higher end platforms. And we'll see how fast we can go. But we just want to make sure that we're true to the initial -- excuse me, the additional investment that's going to be required in our business as we think about the complexity of these platforms going forward. We will still make sure that we are investing internally so that our customers can take advantage of the GPUs that we're using.

Q - Toshiya Hari {BIO 6770302 <GO>}

Great. Thank you. So much. With that, we're out of time. Colette, again, thank you for taking the time with us today.

A - Colette M. Kress {BIO 18297352 <GO>}

Thank you.

Q - Toshiya Hari {BIO 6770302 <GO>}

Thank you. Thanks so much.