BofA Securities Global Technology Conference

Company Participants

- Colette Kress, Executive Vice President and Chief Financial Officer

Other Participants

- Vivek Arya, Bank of America Merrill Lynch

Presentation

Vivek Arya {BIO 6781604 <GO>}

Hello, everyone. Thank you for joining us in this afternoon session. I'm Vivek Arya. I had the U.S. semiconductor research team at BofA here in New York. And I'm really delighted to have Colette Kress, the CFO of NVIDIA, join us to share her insights about the industry and NVIDIA, and all the exciting things that company is involved in. Before we go into the fireside, I just want to turn it over to Colette. She has an opening statement and then we'll go through with the Q&A.

With that, welcome Colette, and to you.

Colette Kress {BIO 18297352 <GO>}

Great. Thanks, Vivek, and thanks so much for having us. I have to make an open statement. As a reminder, that the presentation and discussion today, contents will have forward-looking statements that investors are advised to read our reports filed with the SEC for information related to risks and uncertainties facing our business.

But first, let me kind of make an opening statement. NVIDIA is just turned the corner in terms of announcing our earnings just several weeks ago, a quarter in terms of record revenue, and strength across all of our market platforms. We reached a record in total, in Gaming, in Data Center, as well as Pro Vis. A strong demand across our platforms is there, even as we work through some of the challenges that we are seeing in terms of the semiconductor industry's overall supply.

We even provided the opportunity for us to reach another record quarter with our guidance for Q2 as well. We see strength in Gaming and in Data Center, as we work into Q2 and expect all of our market platforms to do well. This is a time when our overall Ampere architecture for Gaming, our Ampere architecture for Data Center is hitting strides and ramping quite well. So I'm going to turn it back to Vivek and see if we can start today's conference with some of the questions that you may have.

Questions And Answers

Q - Vivek Arya {BIO 6781604 <GO>}

(Question And Answer)

Excellent. Thank you, Colette. So maybe let's start from the supply side and then we will go through the different demand drivers, like you mentioned supply as one of the headwinds, very broad-based for the industry. Is there a way to quantify how much that is restricting your growth this year? Part B is, what steps are you taking to get supply aligned with the demand? And then kind of part C is, when do you think supply and demand will start to align for you? Can that happen this year? Is it a 2022 event? Just give us some more color on the supply situation for you.

A - Colette Kress {BIO 18297352 <GO>}

Sure. We've been working through supply for actually a very long time. Keep in mind, demand is strong across all of our market platforms, so an issue that we have to realize and work through some of the supply constraints that we have. The supply constraints are largely apparent in our Gaming business, although some of our products in maybe Data Center or a few in terms of Pro Vis may also be constrained.

We have employed, what we refer to as, a dual-foundry strategy that allows us to use the full capabilities of our supply chain for longer planning cycles, and that has helped us with our current environment that we are seeing. We expect our supply to increase throughout the year. We expect growth, as we continue to add supply throughout the year, but we do expect that we will be supply-constraint in Gaming as it relates to the overall channel levels for probably most of this year, just based on the strong demand that we are seeing.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. Colette, just to dig into that. Are you supply-constraint just in Gaming, or also in the Data Center? And how has this kind of dual-foundry strategy help you align with the market demand in these two different markets?

A - Colette Kress {BIO 18297352 <GO>}

Yes, so our -- most of our supply-constraint is focused on Gaming and where a bit of our efforts are. But keep in mind, we were pleasantly surprised, of course, in terms of the strong demand that we saw in terms of Gaming, which, therefore, put pressure on supply. We have supply for growth in all of our other markets as well, Data Center and Pro Vis, but keep in mind, we don't have an exorbitant amount of overall supply if things change in terms of super strong demand going forward. So some of our products may be limited in terms of the supply that we have.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. So if you look in the second half of the year, right, as you were expecting the second half to be stronger, should we assume that more of the growth comes from

Gaming because you're getting more of the supply? Or is it more tied to the seasonality that Gaming is more of a consumer business or perhaps there is more growth in Gaming because of that? So what are the kind of the drivers of that second half demand strength that you mentioned.

A - Colette Kress {BIO 18297352 <GO>}

Yes, so this takes us that opportunity to really look at our full strategy with our dual-foundries. Our expectation is, in the second half of the year, the economy will likely continue to expand and improve post the overall COVID. Our overall dual-foundry strategy that we have has enabled us to provide Ampere at both of our overall foundries. And many of our work with the foundries is long-term based. So we've been working on building out our platforms -- our advanced platforms at both of these foundries, and we do believe that will enable our growth as we go into the second half of the year.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. So let's step through the different demand drivers, and I'll only ask one or two questions about crypto, because that's not the focus of the business. But there is a great deal of interest in that. So the real question is that, you have announced a step to have a very specific crypto mining board, right, the processor -- the CMP product. How much of the crypto mining exposure of NVIDIA is contained within that CMP product? And how much of it do you still think is being reflected in your Gaming segment?

A - Colette Kress {BIO 18297352 <GO>}

(Technical Difficulty)

Q - Vivek Arya {BIO 6781604 <GO>}

Okay, that is much better as I should have mentioned it before. I thought maybe it was something from my side. Would you mind just repeating just the last 10, 15 seconds. So the question was, how much of the crypto exposure is on the CMP product? And how much of it is being reflected on the Gaming side? I think we missed that answer.

A - Colette Kress {BIO 18297352 <GO>}

Okay. Let me try here in terms of what we're seeing within Gaming that maybe overall crypto. I want to first start to help folks understand that we can't always see what our end use of our cards are. And so it is very difficult for us to determine within Gaming how much is possibly being used for crypto. There could be cases where people are duly gaming and also using crypto. So at this point in time, that's just not something that we're ever going to have a full understanding. But we can take actions to try and steer more of our GeForce supply to our overall gamers.

What we've done is we've created the CMP boards for our overall professional miners. Our CMP boards stand for crypto mining processors to where they are engineered and manufactured for the algorithms of overall crypto. Additionally, we

have de-hashed our newly manufactured GeForce GPUs. What this allows us to do is make sure that there is more supply, specifically for those that want to game, and the de-hashing will essentially to tier [ph] overall miners from buying those GeForce cards. We hope this strategy, this dual strategy, will again provide more of a supply for the GeForce gamers that are out there.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. So Colette, when we go -- and I've tried to do that, my team has tried to do that many times to just go to any of the e-tailer websites or eBay to just buy an RTX card, right? And they are selling for two, three times above MSRP. Is that gamers who are creating that level of ASP inflation? Like from the outside, how will we know when there is enough supply available? When we see those externally available prices kind of getting back to recommended price? Like, if you were in our shoes, how would you monitor when the supply situation becomes more normal? And also, very importantly that the demand is really being driven by a gamer -- a majority gamer rather than a majority miner?

A - Colette Kress {BIO 18297352 <GO>}

Sure. Let's first talk about the overall Ampere architecture -- the Ampere architecture for Gaming. This is an important architecture. It provides a tremendous performance leap from the last generation, 2x better performance from what we had seen in Turing. It is providing overall ray tracing as well, and there has been a long list of new games that have now been enabled for ray tracing, more than 130 enabled games and overall applications. So we do know that the demand for Ampere is quite strong. We have adoption right now of ray tracing within our installed base still at the early levels, or essentially, we believe probably 80% of our installed base could still benefit from upgrading to take advantage of our overall ray tracing.

But what we have right now is strong demand, which is, therefore, putting a strain on supply. And when there is a strain on supply, we have seen an increase in the overall ASPs that you see at the endpoint. Now, keep in mind, a lot of that is driven by the channel driven by the overall distributor. The best that we can do to help work through that is to provide more supply, and make sure that supply is geared toward the GeForce gamers, so we can start to see those prices come back down to normal manufacturer's suggested retail prices. That's our goal that we are looking at for Q2 and beyond to actually build that. We believe that -- given that there is such small amount of supply in the channel today, we believe that there is strong demand out there that we just haven't been able to reach all of the gamers, even though Ampere has been with us for several quarters now. We have a ways to go in terms of that upgrade cycle and get them in bond [ph] overall Ampere.

Q - Vivek Arya {BIO 6781604 <GO>}

So if a friend or relative came to you and say, Colette, when is the best time to buy a 3070 or 3080? When would you say that, okay, this is the best time and this is when you can actually buy some -- one of those cards at an attractive price?

A - Colette Kress {BIO 18297352 <GO>}

Well, several relatives that have asked me that question, and probably even more they've asked me the question, do I have any spare ones to give? So even my dear family members have not been able to find some of that supply. If -- once the supply is available and -- in the market, I strongly encourage that the enjoyment from that overall gaming card will last quite long. We can't (inaudible) control that manufactured retail price, as that is by the channel. And we do hope that those prices will come down as we work in this next quarter to improve the overall supply for those gamers.

Q - Vivek Arya {BIO 6781604 <GO>}

Understood. And when -- Colette, you mentioned that only -- less than 20% of the base has upgraded to something that is RTX capable. Give us some historical flavor for what that 20% means? Like, is 40% the peak, is 50% the peak before you introduce a new architecture? So where does the upgrade cycle usually get to? And an important aspect -- other aspect of this is that, for the 80% who do not have an RTX card, what kind of an ASP uplift does it promise to you when they do upgrade to something that is RTX capable?

A - Colette Kress {BIO 18297352 <GO>}

Okay. So let me see if I can unpack a little bit of those questions regarding what we're seeing in terms of the overall purchasing. This is an opportunity for people to upgrade. With 80% still not on RTX, we have a great opportunity. But keep in mind, with each of our generations in the past, whether that be Pascal, whether that be Turing or here until Ampere, you're correct, we've never reached where -- before we move to a new architecture, we get our installed base up to a high percentage of that installed base. It is often that our top gamers will upgrade each architecture because they get excited about the new opportunities within each architecture. And there's often where we see people buy multiple times within that architecture.

So it's very common for us to have such a low percentage right now as we're moving to get people towards overall Ampere. We don't have any overall specific goals, and it's going to depend as that volume increases over this time on how fast that increased installed base will go, because we're also seeing new overall gamers joined the market. More and more we're seeing overall gaming move to entertainment medium or using us not over for -- only for social purposes, we see a lot of creators coming into the market and finding, again, the opportunity to gain as well as so many other different use cases around it. So we'll continue to watch this market and try and get as much supply there. But we're excited about the upgrade opportunity that we have both going into the back-to-school season, as well as the holiday coming around the corner, too.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. Is it possible, Colette, that -- I imagine at this point, you already have a good idea of the kind of supply you will have available for Gaming in the back half, and obviously, right, you have different demand models built for gaming, is it possible that this gaming growth cycle continues into next year, right? I don't want to pin you to a specific number, per se. I imagine it is not as high as 100% year-on-year growth

that we are seeing. But is it possible that, conceptually, next year is also a somewhat above-trend kind of year in terms of your Gaming business?

A - Colette Kress {BIO 18297352 <GO>}

Where we stand right now and looking forward, we do have an idea of the supply that we're getting. But keep in mind, we still have some work to do in terms of thinking through what specifically we'll manufacture and put into the market. So that is still not absolutely defined as we go forward. We're trying to determine the exact month and timing of both supply and demand will be interesting as we go into back of the year.

When we step back, though, and think about Gaming and -- as a growth opportunity for the company. Absolutely, we think of it as a growth opportunity in terms of long-term. We're continuing to excite them with overall ray tracing, what ray tracing has done in transforming overall gaming. We continue to put out the best performance types of cards. And what we're seeing is not only upgrades, but those new gamers coming into the market. We're at a point where when we think about the holiday season and beyond, I think we will likely see a great holiday season and beyond as a gamer is always a gamer, and looking at new opportunities for them to purchase overall Ampere.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. And final question on the Gaming side is, how much of this extension of this growth cycle also has to do with the fact that there are shortages on the console side also, because I assume one of the drivers of more ray tracing adoption would be that it's being adopted in-game console, so there is probably some kind of mutual synergy that you now have all the gaming platform, right? And that probably then stimulates more software publishers to publish games with this feature. Does that have also something to do with perhaps extending this growth cycle into next year that maybe, as you get more supply on the console side, that also stimulates more of this Gaming growth for you?

A - Colette Kress {BIO 18297352 <GO>}

That is correct. When we entered into the Ampere launch, and entered into that last holiday season, we understood this to be a season where new consoles will return to market. It really drives the overall ecosystems of game development. Game developers are generally writing games for a wide range of different platforms, whether that be consoles, or whether it be the number one platform, meaning the PC platform. So we have been able to attract overall game developers. Game developers building RTX games or building games for the new transformation to real-time ray tracing. That has benefited us. It's benefited the industry as a whole, as people are playing together. So what we're seeing in terms of our overall consoles that we have with Nintendo, what we are seeing also with mobile form factors, such as our notebooks, have also strongly increased in here. So just the mere production of new games is the number one reason to attract overall gamers to purchasing overall hardware.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. Let's go to the Data Center side. So if you look on the Data Center side, talk to us about what is the level of demand that you're seeing right now, maybe we will first start for the cloud side and then go to the enterprise side. Is this cloud demand in line with what you think? Because we had a mixed picture. We have Intel saying cloud digestion. We have AMD saying, where is the digestion? I don't see it. Right? So there's been a very -- there's a lot of mixed picture. So if you separate out the benefits of Ampere from just the spending environment. How would you characterize the spending environment among your cloud service customers?

A - Colette Kress {BIO 18297352 <GO>}

Okay. So let's start with our overall Data Center business and what we saw in terms of Q1. Our Data Center business grew 8% sequentially last quarter, even as much of the industry as a whole declined over that period between Q4 and Q1. When we think about our overall hyperscale business, remember, our hyperscale business incorporates what they may use for internal use, but also what they do to set up the overall cloud instances that researchers and enterprises do. Our hyperscale business was up double-digits sequentially from Q4 to Q1. So we really didn't see much digestion. Now, why, what we see in terms of the cloud instances, the hyperscales, is they're focused on solving some of the key solutions that they need for acceleration, and particularly for AI solutions.

So we're well aligned with some of the top priorities that we see at the cloud, but also what we see in terms of the overall enterprises. We see that strengthening of hyperscale demand, as we look forward as well, and probably the growing set of interest in terms of the vertical industries, particularly as we see them coming back to the office and the economy likely to improve over the second half of the year. We expect growth both in computing and in our networking. We hope to see that solid demand across both training and inferencing as we go through the year. Also, we have launched some additional amount of products with our NVIDIA-Certified Systems that -- and our NVIDIA AI Enterprise software that we are well positioned for a new vector of growth with mainstream enterprise and tiers [ph] as we go forward.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. Do you expect your cloud demand to be stronger in the second half versus the first half?

A - Colette Kress {BIO 18297352 <GO>}

It's very difficult for us to determine whether that cloud increase will stem from enterprises using the cloud or enterprises choosing to actually bring that in house or going through some type of hybrid model. What we do know is that our hyperscales look to build out the cloud based on the demand that they see. They try to stay ahead of that and see the use cases for continued overall growth. What we do believe is the enterprises will come back into the market with the overall economy, but there are many different types of solutions for them to support that, anything from the cloud or purchasing on-premise.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. Because -- I believe one thing that either yourself or Jensen had said is that you expect some kind of acceleration in your Data Center business. So how much of that is a predicated on the growth among your -- first, how much is enterprise as part of your overall Data Center business? And then how much of the second half growth is predicated on enterprise recovery.

A - Colette Kress {BIO 18297352 <GO>}

Yes. So we've kind of talked about our breakdown of our Data Center business between our hyperscales and our enterprise. So our hyperscales -- now keep in mind, the hyperscales, remember, have that cloud instances and the use cases of those cloud instances often our enterprises. But the best that we can see is we're able to divide between our hyperscales and what we're seeing in terms of our vertical industries. That number is about 50-50. 50% coming from the hyperscales. And yes, we have built up in our Data Center business supporting the 50% of our revenue with those overall vertical industries.

So the focus in terms of AI is not just focused on hyperscales. The enterprises are very interested in building out their businesses to support AI as well. When we think about the second half of the year, we will likely see the growth both in the hyperscales and the enterprises, as we see that acceleration going forward, from both aspects of hyperscales building out the overall cloud, but also enterprises coming back to the office and focusing on building out their workloads on accelerated and AI.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. And Colette, what are the top few applications that you're seeing that enterprises are kind of gravitating most towards using NVIDIA products?

A - Colette Kress {BIO 18297352 <GO>}

Wow, there's a lot of different things that we have both enabled with what we do in helping them stitched together from our product solutions and our platforms to what they may want to do in terms of in the enterprise and in the industries. We have focused on many different workloads and industries where we think the benefits of acceleration and/or AI would really help their business models. As you know, retail and e-tail have highly focused in terms of recommendator or recommendator engines, very similar to the work that you've seen in terms of the hyperscales. You see cloud, Internet companies and you see much of e-tail and retail focused on drawing people to their websites, and that form of marketing can just be recommendator engines. So that's one area of focus.

Additionally, we've seen both financial services, we've seen manufacturing, we've seen a good representation of folks on supply management, forecasting and using overall data science to speed up the work that they do to make sure that their processes are well aligned. We'll continue adding more and more high-level

workloads, but those are some of the key areas that we do see people concentrating on.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. Colette, I'm curious when an enterprise or even a cloud customer when they buy an accelerator, do they always buy it next to a new server buy? Or can they also or do they also retrofit existing server deployments, right, to perhaps improve their application, right, with the addition of accelerators? Because we are always trying to figure out where we are in terms of attach rate of accelerators and we are kind of limited by the, whatever, 12 to 15 million servers that are sold every year. So our accelerators always sold with new servers? Or can they also be retrofitted with existing deployments?

A - Colette Kress {BIO 18297352 <GO>}

So what we are seeing across the industry is maybe a two-fold. Yes, a significant amount of clusters are being purchased newly, newly designed, because I think there are great things within a lot of the server configurations to enhance their workloads overall, the acceleration -- and remember, all of the different parts with that. We have focused not only on acceleration of the GPU, but acceleration in terms of the networking. We've seen us all focused in terms of acceleration on using a DPU to enhance that overall experience. So purchasing new clusters for the new modern data centers is a very important piece in terms of that expansion.

Additionally, we see folks purchasing or adding on to their existing clusters that may be accelerated. They have already trained models. They have already deployed a configuration of acceleration, and it may be needed to add in terms of more about that that's something that they would like to do deploy. There is an opportunity, as you know, within their existing servers for them to attach and put in an infringed product into a PCIe slot and that is a possibility. But the first two are probably the key focus areas that we see enterprises and hyperscales doing.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. So is it -- because we always find that tough to forecast growth for the Data Center business, right, over long periods of time, and I'm talking just on the compute side. Is this way of looking at how many accelerators are being added every year, right, versus the number of CPUs? Is this a good way of projecting that growth? And if yes, what is the attach rate? Is it 10%, 15%? Just -- again, if you were in our shoes, how would you project NVIDIA's computing growth opportunity?

A - Colette Kress {BIO 18297352 <GO>}

Well, let's go back and remember that an accelerator added to any server system is taking on more work than any single overall CPU server. So it wouldn't be a one-to-one comparison that says one accelerator versus the CPUs to determine the overall attach rate. The best that we can do is really look at the overall TCU -- TCO value that we are providing to our customers, and helping them understand that we have now enabled them to have a very streamline approach to their data center if using acceleration and AI.

I think the best way that I could articulate how to count, how to measure in terms of where we are. I think the easy answer is to say, we're in the early days. We're in the early innings of what we're seeing in terms of the long-term a move to accelerated computing and the use of AI almost in every single workload. Now, why do we only consider that to be in the early days? There is still a significant amount of applications and software that needs to be stitched together to influence all workloads to move to use accelerated or overall AI. We have put together a large list of that when you think about our work that we've done with the CUDA development platform, and many of the both compilers, frameworks as well as system software that we have done to add to that. But we still have a ways to go.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. And then, Colette, in the last two or so minutes that we have, I was hoping if you could give us an update on the Arm acquisition. Where are you in that regulatory process? What's your level of confidence in closing that announced acquisition? Just give us some update on where you are in that process.

A - Colette Kress {BIO 18297352 <GO>}

Sure. So we are working with the regulators all across the world. This is part of the process that we know well after completing the overall Mellanox acquisition. We are working with each of the jurisdictions, whether that be the U.S., the U.K., in Europe, as well as moving to China.

Now, keep in mind, the details of those discussions with regulators are generally a confidential discussion. It is about helping them understand the technologies, learning about the two companies. But the discussions right now are going well with overall regular -- regulators. It has been productive and we are proceeding as anticipated. Our milestone in terms of completion, we are still expecting in the early part of 2022 to complete the acquisition of Arm.

Q - Vivek Arya {BIO 6781604 <GO>}

From what you have disclosed and described before, Colette, have you heard of any big -- I know there have been some push backs on the U.K. side, have you heard of any other push backs or any other feedback perhaps from potential customers, right, if the two companies are able to get together?

A - Colette Kress {BIO 18297352 <GO>}

Yes, we have been with discussions with customers, as, keep in mind, many of the customers that Arm has are some of the same customers that we do.

Q - Vivek Arya {BIO 6781604 <GO>}

Right.

A - Colette Kress {BIO 18297352 <GO>}

We continue working in very great conversations with them, and many of them truly understand the benefits of NVIDIA working with them. There's a lot of different communication out there, but right now, we are focused in terms of what is needed for that overall regulatory process. The regulatory process really is about providing for competition and really assuring all customers will maintain everything that they have today, and we can absolutely honor that.

Q - Vivek Arya {BIO 6781604 <GO>}

Got it. Okay. One last question, will the DPU, the data processing unit, do you think that can be a measurable part of the business here next year?

A - Colette Kress {BIO 18297352 <GO>}

Let me see if I could answer that about the DPU. The DPU is an essential part of what we consider to be the modern data centers going forward. You're probably going to see three parts. You're going to see a need for, of course, the CPU form of an accelerator, such as the GPU and the DPU, which is that data processing the unit, an important piece, which will enable the encryption, the overall security, that is necessary for the data that is passing through to your whole data center. This will be beginning to ramp in the second half of the year and we do believe that will be meaningful as we turn the corner into the new year of calendar 2022.

Q - Vivek Arya {BIO 6781604 <GO>}

Great. Thank you so much, Colette. Really appreciate you're taking the time and sharing your insights. Thanks everyone for joining. And please feel free to write to me if you have any follow-ups. Thank you so much for that. (inaudible) Take care.

A - Colette Kress {BIO 18297352 <GO>}

All right. Thank you so much.