

# JP Morgan Tech/Auto Forum 2022 International CES

## Company Participants

- Colette M. Kress, Chief Financial Officer, Executive Vice President

## Other Participants

- Harlan Sur, J. P. Morgan

## Presentation

### Harlan Sur {BIO 6539622 <GO>}

Good morning. Happy New Years and welcome to our 20th Annual CES Virtual Tech Investor Forum. My name is Harlan Sur, I'm the semiconductor and semiconductor capital equipment analyst with the firm. Very pleased to introduce Colette Kress, Chief Financial Officer of NVIDIA. It's been a tradition to have the NVIDIA team to be first present in our conference, because the team is driving much of the trends that you will be hearing about today, Artificial Intelligence, Compute Acceleration, Next-Generation Compute Architectures and Automotive, Next-Generation Gaming Technology along with emerging software and services ratable revenue stream.

So, I'll ask Colette to start us off with an overview of what the team announced yesterday, at its special CES Address, and then we'll go ahead and kick off the Q&A. So Colette, thank you for joining us today and let me go ahead and turn it over to you.

### Colette M. Kress {BIO 18297352 <GO>}

Thanks so much, Harlan for having us here. We appreciate the time to kick [ph] you off every single year. But I do need to start off with an open reminder, that the presentation may contain forward-looking statements and investors are advised to read our reports, filed with the SEC for information related to risks and uncertainties facing our business.

So we're here at CES primarily just virtually and we had an opportunity to both discuss some announcements and things that are aligned to our growth drivers moving forward. Let me first start with our gaming and graphics. We're seeing a significant growth opportunity in GeForce and Omniverse.

First, we've had record PC gamers. If you've seen in the previous part of this week, Steam had announced that the concurrent users on Steam had reached record levels. Additionally, we have the creator Metaverse economy in front of us. Recently, companies such as Nike and Gucci have announcements in the Metaverse, a big rise

of influencers and broadcasters. This is aligned to our strategy here with both studio and Omniverse.

But some of the announcements that we did at CES yesterday regarding gaming and Omniverse. First, the new laptop inclusive of GPUs. Laptops that we discussed are available starting on February 1. First one's GeForce RTX 3080 Ti laptops, starting just under \$2,500, faster than the desktop of NVIDIA, Titan RTX.

Additionally, we announced the GeForce RTX 3070 Ti laptops, starting at just under \$1,500. These are 70% faster than RTX 3070 super laptops. So unveiling more than 160 gaming and studio laptop designs for this New Year. These are on the fourth generation of our Max-Q technology. To remind you, our Max-Q technology is essential in creating the thin and light, and also the high-performance laptops that we all know. These new studio laptops are also based on the 3080 Ti and the 3070 Ti. These on average are 7x faster for the 3D rendering than the latest MacBook Pro 16, and they support more than 200 creative applications.

Additionally, we have the new GeForce RTX 3050 for desktops. The first 50 class desktop GPU to power the latest ray-traced games at over 60 frames per second. It starts just under \$250 and will be available later this month, January 27 from NVIDIA's worldwide partners.

We also announced new RTX games, 10 new RTX games, including titles, like The Day Before, The Escape from Tarkov and the highly anticipated Ubisoft title, Rainbow Six Extraction. Over 20 million GeForce gamers compete with Reflex each month as well. So our RTX games are here to work seamlessly with our RTX infrastructure as well.

Moving to GeForce Now. GeForce Now is our cloud streaming GeForce service. We have extended the partnership to Electronic Arts, bringing Battlefield 4 and Battlefield 5 to GeForce Now streaming today. We also announced a partnership with Samsung to integrate GeForce Now in its smart TVs, starting in Q2 of this year, and then partnerships with AT&T. AT&T, starting in January, customers that are on 5G can get a six-month GeForce Now priority membership at no charge.

NVIDIA Omniverse is now also available at no cost to individual creators on RTX GPUs. This new platform feature Omniverse Nucleus cloud enables simple one click to collaborate sharing of large Omniverse 3D screens. This new platform developments are also available, such as Omniverse Machinima and Omniverse Audio2Face. Since its open beta just a year ago, Omniverse has been downloaded by more than 100,000 creators. Today's there -- today, there is 14 connectors to applications like Autodesk and Autodesk Maya, and Epic Games' Unreal Engine.

So these are important announcements that we've made just here now at CES this year, but we also took this opportunity to talk about Auto. Auto has seen an important inflection in the world of electric vehicle adoption. This will benefit our

business as we start shipping Orin this year, as our designs with -- design wins with Orin in electronic vehicles are significant.

In China and U.S., they are positioned as tech companies with software-defined strategy, these new electronic vehicles. Hyperion 8 adoption opened up the opportunity for ADAS and also auto opportunities include Omniverse Replicator, Omniverse Sim, NVIDIA AI DGX, and NVIDIA AGX.

When we talk about our announcements that we made here at CES for auto, it first starts with our leading Tier 1 partners that have adopted the DRIVE Hyperion 8 platform. Hyperion 8 is our computer architecture and sensor set for full driving systems. And we have many of our OEM partners today, including Desay, Flex, Quanta, Valeo and ZF also, who have adopted the platform. They help manufacture production-ready DRIVE Hyperion systems. DRIVE Hyperion platforms have been adopted by all of these new energy vehicle OEMs. And we also are seeing the upcoming cluster three SUV features, a centralized computer architecture powered by NVIDIA DRIVE.

DRIVE Orin adoption by these NEVs in China, NIO, Xpeng, Li Auto, R Auto and SAIC are also key at this time. These are the world's largest automakers, very successful driving transition to the NEVs. Nearly 20% of all cars sold in China in this past quarter were electric.

And then lastly, TuSimple. We are building its autonomous trucking platform on NVIDIA DRIVE Orin. Consumer shopping has dramatically shifted online, resulting in increased demand for trucking and last mile delivery. So a lot of great things, announcements, both driving growth in key areas such as graphics and gaming, but also a focus of auto here at CES.

## Questions And Answers

**Q - Harlan Sur** {BIO 6539622 <GO>}

(Question And Answer)

It's a great overview, Colette. Thanks a lot. Let me kick it off with the first few questions. For clients tuning in, you can feel free to use the Q&A button on your digital dashboard to type in a question. So, let's start off with the overall business trends and supply-side situation as we head into calendar '22.

So, last time at this year, the consensus view was that the NVIDIA team would grow their revenues 20%, 25% in calendar '21. If you hit your guidance this quarter, the team is set to grow its business 60% plus in calendar year '21. So, quite a bit of upside relative to prior expectations and the Street has to team up another 18% to 20% for this calendar year, which is your fiscal '23. Help us understand the trends and product cycles that are going to drive your fiscal '23 and longer term? How

should we think about the overall growth profile for the different business segments, gaming, data center, ProVis and automotive?

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

Yes. A great question. So, let me first start with one of our key opportunities that has been with us and that is RTX. RTX has been powering graphics for both the gaming and our ProVis businesses. This technology continues to fuel remote collaboration. It allows distributed virtual workforce and it also helps the creators in their work that they do. Omniverse now adds a significant growth vector to gaming and enterprises with virtual worlds and digital twins. RTX will still be powering our growth as we move into this new calendar year.

Secondly, data center demand led by full scale deployments of AI are now being seen inferencing and AI continue to outpace overall data center growth. Our software opportunities help enterprises easily deploy AI solutions from our enterprise AI software to our over 150 SDKs tailored to specific industries to advanced AI, computer vision, inference and natural language processing. So data center will continue to be an important growth as we move forward.

And then lastly, our \$8 billion autonomous pipeline in automotive will begin to take off in the second half of this calendar year or our fiscal 2023. From designs across the passenger vehicles, the robotaxis and the trucking. We have announced many of our NEVs additional piece as well, including Orin which will be an important factor as well.

So those are some of the things that we think about as we start this new calendar year. Much of the growth that we started to see in this last fiscal year will also be very important for us as we move into the new fiscal and calendar year.

**Q - Harlan Sur** {BIO 6539622 <GO>}

From a supply side perspective, near term like many others, NVIDIA is supply constrained and I would assume across most of your product lines. Gaming GPU channel inventories, for example, were low entering into this past holiday season and we just checked some of the online retail sites and NVIDIA GPU gaming card pricing is still 3x to 4x higher versus MSRP suggesting that tight supply situation still exists in the channel. You guys also pointed out in the last earnings call that data center networking sales are also impacted by supply constraints.

So I guess the first question is, what products are the most bottlenecked? And with the forward supply purchase commitments stepping up here, any sense on when we should expect to see the team making progress on narrowing the supply-demand gap?

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

Sure. Over this last fiscal year, we've been working on our supply chain as well as our ecosystem supply chain each quarter to make great progress as right now, we see strong demand and we've experienced that across the board. Our demand has

exceeded our supply, primarily in our gaming business throughout this year, but we were able to continue to grow our gaming business this last fiscal year, each and every quarter sequentially.

At the same time, we are securing supply for current demand. We are also partnering with our supply chains to assist in our future capacity needs. In the second half of calendar year '22, we believe we'll be in great shape in terms of supply, being able to meet the demand that is out there. But for right now, we'll continue to work to gather more supply and effectively work with the ecosystem to provide more products faster than market at this time.

**Q - Harlan Sur** {BIO 6539622 <GO>}

The team committed \$1.6 billion of prepayments for supply in fiscal Q3. And you have commitments for another \$6.9 billion till the end of calendar year '22 this year. So given the better visibility from a supply perspective and a strong demand environment, is it fair to assume that revenue growth for NVIDIA is really more dependent on supply growth? And given that demand is strong, is it also fair to assume that if you increase supply sequentially for the next few quarters, you can drive better than the seasonal trends, even, let's say, for the seasonally weaker April quarter as well?

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

So our demand has been stronger than supply for several quarters. And yes, we continue to drive for these long-term supply commitment to help meet that future demand. And they will start kicking in, in the future but right now, we are still working with our supplier partners today to enhance our overall supply.

Now, normal seasonality in our businesses like gaming have not really materialized due to the lean H1[ph] levels and the strong demand. This situation probably will continue until the channel levels start to increase. It's too early to comment at this time in terms of Q1, but our holiday demand was strong and we believe the channel still remains lean [ph].

**Q - Harlan Sur** {BIO 6539622 <GO>}

Right. So let's start off with some of your product segments, especially on data center. So, data center, 40% of your overall revenues, the business is tracking towards 50% year-over-year growth in calendar '21. The team has driven a 65% CAGR on this business over the past five years, phenomenal growth, and the team guided for further acceleration on a year-over-year basis here for this quarter.

Our hardware team is seeing strong cloud and hyperscale CapEx spending for this year. It's targeted to be up about 30% year-over-year, which is consistent with your view that hyperscalers will be a strong driver of the data center business this year. Combine this with continued strong enterprise adoption, strong networking demand pull, can the team continue to drive its data center growth profile sort of north of 30% this year you think?

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

Yes. In our data center business, we're at this point dedicated to build the best accelerated computing platform for the world. NVIDIA AI has outperformed DC growth this last year. NVIDIA's have the best chips for accelerated computing, our A100. And NVIDIA's architecture is also better, that are not only overall in terms of TCO, but also better in terms of delivering performance, as it become very notable in our MLPerf performance. It delivers both highest performance, both on training and in inferencing.

Our platform is also programmable. It's versatile and it offers this high TCO for the hyperscales as well as the enterprises. The NVIDIA AI platform is available from the major CSPs as they create incentives, as well as our certified OEMs and our ODMs in terms of these servers' makers. It is the only full stack platform that serves a broad range of applications and supporting AI. We believe our AI priorities are aligned to the enterprises and the hyperscale priorities as we move into this new fiscal year. The data center growth will be a driver for us in this new calendar year, just as it was in this last year.

**Q - Harlan Sur** {BIO 6539622 <GO>}

Then the enterprise market I think for most semi companies including NVIDIA, obviously seeing strong demand recovery combined with for NVIDIA, expanding adoption from enterprise and vertical customers for new applications, like accelerating, computing, AI, natural language processing, recommendation engines. The team is driving very strong growth here. Are we at an inflection point where enterprise and vertical's growth could match or continue to match the growth of your hyperscale customers? And maybe even be a bigger revenue contributor going forward?

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

So first, let's start off and our enterprise and hyperscale mix in the data center today is about 50-50 with also a small percentage going to supercomputing. Keep in mind, in those hyperscales 50%, there is a portion of that is also available for cloud computing. The cloud computing is an ability for researchers, higher education as well as enterprises to quickly on store [ph]. They may be at the start, but they may continue to maintain in the cloud. So it's difficult for us to say specifically from an end customer perspective, how large the enterprise is. But it's an important piece.

We've been expanding our TAM in the data center. We've expanded our TAM in the data center to include Enterprise software, also inclusive of Omniverse infrastructure on the software and then also our great GPU. So we have more than 150 software development kits that are geared towards the Enterprise industries, 65 of them for example are even new or updated most recently with our GTC announcements a couple months ago. So now as we look at Enterprise AI software, it's available for Enterprises to take advantage of our full stack of AI software that we use here at NVIDIA, also having it aligned with VMware to enable the easy deployments. Omniverse Enterprise is also in general availability. We're seeing 700 companies evaluate, we're seeing more than 70,000 downloads as well.

So, enterprises are purchasing AI platforms through these hyperscale clouds, but also directly. Now, as we see going into this year, Enterprise's growth will continue to be a huge opportunity for us in the data center.

**Q - Harlan Sur** {BIO 6539622 <GO>}

Let's talk about the software, because you did mention it in your commentary just now. So you're enabling customers to come to market rapidly, but developing full-stack turnkey solutions. You're monetizing your software and platforms to subscription and licensing-based services. AI LaunchPad for Enterprise is a good example. GeForce Now on the gaming side is another great example. In automotive, you've got the revenue sharing partnerships and you're just now starting to proliferate as you mentioned, Omniverse Enterprise through a subscription and licensing model.

It's for sure a multi-billion dollar opportunity longer term, but near-to-mid term, what percentage of your revenues today are generated by these annuity like very high margin revenue streams? And any way to help us frame the aggregate opportunity looking out over the next three to five years?

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

Okay. So it's true. Our software opportunity that we see in front of us is a multi-billion dollar opportunity, with all the different opportunities that we have put out there, whether that be Omniverse, Enterprise, AI. We have base command, fleet command, many different forms in their early stages. The most important thing with the software is most of it is also available with the infrastructure the hardware purchases. These will be an important combination as we move forward.

Software is not new to us. We've been key with software for more than 10 years. Many of our platforms that are sold today, incorporate software that is essentially coming with the infrastructure for free. So, software as a standalone purchased, is with us for software support and enterprises are very interested in receiving that support for their mission-critical applications. We believe that this will grow, but we're still in the early stages of this enterprise, but realize that it is an important driver of adoption with the enterprise.

**Q - Harlan Sur** {BIO 6539622 <GO>}

At some point when it gets to a certain scale, will you guys be breaking out software and services, you think?

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

We will certainly -- yes, we will certainly through this time be able to help our investors, both to understand our progress that we have made with metrics along the way. And at some point in the future, we'll be able to comment in terms of the absolute size.

**Q - Harlan Sur** {BIO 6539622 <GO>}

Great. Thank you for that. Let's touch upon gaming. So 45% of your overall business, demand continues to be quite strong here. Business is on track for 60% year-over-year growth in calendar '21. The new RTX 30 series is driving a strong upgrade cycle. You just announced RTX 3050, 3090 Ti products yesterday. But enthusiast class gamers still can't easily get their hands on a 30 series card, both desktop and mobile. You mentioned that 30 series and ray tracing are only about 25% penetrated in the installed base. If you have the supply or looking at the historical adoption rates, where would we be normally in terms of penetration on 18 months post launch of a new architecture?

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

So let's first start with RTX. RTX is in its second generation and RTX is about 25% of our installed base, based on our estimates. Now Ampere is our most successful architecture at this point. And the price points launched so far, we have enabled RTX at manufacturer's suggested retail prices, even below the \$350 price point. Its adoption within our installed base is almost 2x the pace of Turing and more than 3x the pace in terms of what we saw with Pascal and Pascal was a successful architecture.

Ampere has continued to drive strong unit and ASP growth. For the first nine months of our fiscal '22, for example, both units and ASPs grew about the same across our desktops and notebooks. Our holiday demand was also very strong, especially in laptops as well as with the OEMs and the system builders who are working to get RTX systems to gamers.

Over the last couple of years, though we will continue to see RTX growth to be a more significant portion of our installed base. We do hope that the manufacturer's suggested retail prices can come down, as we serve more supply into the market.

**Q - Harlan Sur** {BIO 6539622 <GO>}

Perfect. And then I've got a question from an investor. So based on some of your competitors' other press announcements yesterday, how is the NVIDIA team thinking about market share in GPU with both AMD and now Intel introducing new discrete GPUs and bringing them to the markets fairly soon here?

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

So, we're not a stranger to the competition in discrete GPUs. This has been such an important part of our history and we will continue to work on building the best discrete GPUs for the consumer market. That is both for gaming, that is for creators, and it's also for the Enterprise world. Our brand stands up for a reason. It is not only just about an important architecture on the chip, it is about a full ecosystem surrounding our overall chip for the consumer industry. Now what we have seen is our performance and our overall architecture outperform them and we'll continue to work on doing that as we move forward.

**Q - Harlan Sur** {BIO 6539622 <GO>}



Perfect. Let's talk about Metaverse and Omniverse. You know there's been lots of discussion obviously on the Metaverse or what NVIDIA terms Omniverse. This is not a new concept, right, for the NVIDIA team. You've been helping customers in the automotive markets, for example, enable 3D simulations, digital driving environments and creation of digital twins in your automotive business, all hopping and training your customers automotive AI models.

Now with Omniverse, you're creating a full-stack hardware to software to services solutions. It enables 3D simulations, digital twins, avatar creation. And now you're expanding this into many different end markets, right? How should we think about the evolution of the Metaverse or Omniverse from here, right? I would assume that mid-term, it's focused on digital environment creation, digital twin creation for virtual simulations and service-oriented avatars, for example, for verticals such as retail. But wanted to get your views.

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

Yes, great question. So, Omniverse and the world of Metaverse will continue to grow, and we'll hear more and more about these opportunities as we move forward. So, let's step back and look at the Omniverse and what it addresses. It addresses two distinct opportunities: one, digital twins; and two, the 3D virtual world creativity that is out there. Omniverse is powering the next era of AI. It is allowing to use all of the key capabilities, whether that be ray tracing, whether that be AI, whether that be really just simulating physics in the new world of Omniverse.

We have the availability of Omniverse for autonomous machines and SDCs - Synthetic Data Generation, ability for just testing and validation. So it's not necessarily testing and validating in the true world, but you're able to build products and test those products in a synthetic built world on Omniverse. Omniverse also has the ability for Omniverse Replicator, an ability to use DRIVE Sim, or for example Isaac Sim to help also in the simulation.

Omniverse is also for human AI interaction. This is where we talk about Omniverse Avatar for our DRIVE Concierge, but also Omniverse Avatar for Project Tokkio. These are important things where digital twins and virtual worlds will come to life.

Omniverse Enterprise right now has about 700 companies evaluating 100,000 downloads, 70,000 now as of that November update that we provided at earnings. But building Metaverse has already started. We're seeing content for creators, cloud gaming infrastructures and also enterprises who are building digital twins.

Omniverse addresses 40 million designers and engineers and will produce a subscription-based model for these designers and engineers. And this could be something where \$1,000 a year for each designer or you can go in terms of a working group at a higher price point for them to receive the software. But the software will have a multiplier -- a multiplier of the systems and the chips that will be important for enabling these environments. It could be a multi-billion opportunity over time. But as we move into fiscal year '23, we're going to start to see the onsets of Omniverse from an infrastructure and the beginning of the software purchasing.

**Q - Harlan Sur** {BIO 6539622 <GO>}

Perfect. Well, unfortunately, Colette, we're just about out of time. I want to thank you as always for your participation and support. Looking forward to the NVIDIA team driving a really strong growth profile this year. So thank you very much for participating.

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

Thank you so much. Have a great New Year.

**Q - Harlan Sur** {BIO 6539622 <GO>}

Thank you.

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