

# NVIDIA GeForce Financial Analyst Q&A

## Company Participants

- Colette Kress, Executive Vice President and Chief Financial Officer
- Jeffrey D. Fisher, Senior Vice President of Gaming
- Simona Jankowski, Vice President- Investor Relations & Media Contact

## Other Participants

- Aaron Rakers, Analyst, Wells Fargo
- Brett Simpson, Analyst, Arete Research
- Charles Long, Analyst, Goldman Sachs
- Harlan Sur, Analyst, JPMorgan
- John Pitzer, Analyst, Credit Suisse
- Matt Ramsay, Analyst, Cowen
- Stacy Rasgon, Analyst, Bernstein Research
- Vivek Arya, Analyst, BofA Securities

## Presentation

### Operator

Good afternoon, my name is Mike, and I will be your conference operator today. At this time, I would like to welcome everyone to NVIDIA's GeForce launch Financial Analyst Conference Call. All lines have been placed on mute to prevent any background noise. After the speakers' remarks, there will be a question-and-answer session. (Operator Instructions). Thank you.

Simona Jankowski, you may begin your conference.

### Simona Jankowski {BIO 7131672 <GO>}

Thank you. Hi, everyone, and thank you for joining us today. We're very excited for this opportunity to discuss with you our big launch today of the GeForce RTX Series 30-GPU family. On the call with us we have NVIDIA's CFO, Colette Kress; and our SVP of Gaming, Jeff Fisher.

The format of today's call will be a short presentation followed by Q&A. You can find a copy of the presentation as well as the replay of Jensen's virtual launch event from earlier today on our Investor Relations website. And after the presentation, we'll open it up for Q&A for either Jeff or Colette.

Before we get started, I need to read a quick statement. During this call, we may make forward-looking statements based on current expectations. These are subject to a number of significant risks and uncertainties and our actual results may differ materially. For a discussion of factors that could affect our future financial results and business, please refer to our most recent forms 10-K and 10-Q and the reports that we may file on Form 8-K with the Securities and Exchange Commission. All our statements are made as of today, September 1, 2020, based on information currently available to us. Except as required by law, we assume no obligation to update any such statements.

Okay. So with that, let me turn it over to Jeff, to kick us off.

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Thanks, Simona. Welcome, everybody, thanks for joining us today on the call. So it's been a very big day. It's really exciting, working up to our launch today. It is our first virtual GeForce launch, kind of missed the live events, in-house with gamers. But this was certainly a successful event regardless. And the team did an amazing job pulling it all together. Everyone working at home, it was a new experience, but it was an amazing production. The work was made even easier because we had a great story to tell with Ampere. I hope you all enjoyed it. Let's get started.

I want to go through some of the highlights of the presentation today. You may have all seen Jensen's key note, hopefully you did, but I want to go through some of the key points in slides and then we'll get on to question and answer. In the wake of COVID, it's evident that gaming has become a part of everyday life for billions of people. Gaming connects people, it entertains, it tells stories, it's a sport and allows - that allows people to create or even become broadcasters of their own content. GeForce PC gaming is large and thriving, it's open, it's scalable.

Games like Call of Duty and Fortnite have attracted hundreds of millions of gamers and are now offering new experiences to participate, like the Travis Scott concert in Fortnite earlier this summer, where almost 30 million people were participating and watching in the game. 75% of GeForce gamers play Esports titles. Esports has an audience of over 500 million people and it's a new competitive genre for most of a brand-new generation of gamers.

Gaming has also opened up a new world for creators who can modify games, create their own stories, using game assets to share with their friends, a whole new medium for creation. With PC Gamers, anyone can broadcast their gameplay with PC -- with a gaming PC, anyone can broadcast their gameplay like a pro, to a wide audience or just to a few friends. Today, there is over 20 million streamers globally.

So let's talk about the product. NVIDIA RTX is not just the GPU, it is a full stack. It starts with the new GPU architecture -- our new GPU architecture, which is RTX. On top of RTX, the device, it includes new engine tech for games and for creative apps, and a bunch of new rendering algorithms that are invented by NVIDIA research team.

All the major 3D APIs have extended to include RTX. RTX is supported by all major 3D creation tools. RTX Tech is incorporated in all major game engines. There are hundreds of games being developed with RTX Tech and there has been thousands of research papers written about it.

We started designing the RTX architecture over 10 years ago to address limitations that we saw coming in traditional rasterization technology. The RTX GPU has three dedicated processors, the programmable Shader which we designed over 10 years ago, a revolution in graphics in and of itself, and RT Core to accelerate ray tracing, and the Tensor Core, which is an AI processing pipeline. The Tensor Core powers our graphics AI technology, DLSS, which delivers high performance and image quality in games and is now viewed as critical to deliver high performance ray trace gaming. RT and DLSS are in a majority of the new generation of games.

Let me start by showing you how the three dedicated cores work concurrently. First, Shader, this is an example of a single ray trace frame of the game Wolfenstein: Youngblood, so it's one frame. The Shader could do all the work of ray tracing and rasterizing. Some architectures may attempt to do this, even Pascal was capable of ray tracing but the perf is bad. This is 51 milliseconds of just using Shader to ray trace a Wolfenstein frame, 20 millisecond -- 51 milliseconds is less than 20 frames per second. The game will be virtually unplayable. Adding RT Cores gets you 20 milliseconds per frame. RT Core (inaudible) concurrently with Shaders. But 20 milliseconds is still not 60 frames per second. That is where AI comes in, adding our Tensor cores and DLSS, you are now gaming well above 60 frames per second at 12 milliseconds per frame.

It's all about three dedicated cores capable of concurrent operation to deliver high performance ray traced gaming.

Now we get on to Ampere, our second-generation RTX architecture. Ampere has a new Shader, at 30 Teraflops, it is 2.7x turns performance. It has our second Gen RT Core. At 58 Teraflops, it is 1.7x the performance of turing and ray tracing. And it includes our third-generation Tensor Core with 238 Tensor Teraflops for AI and DLSS. In all, the three cores deliver 2x perf, three cores, 2x perf. This is our triple double.

So today, in Jensen's kitchen, we introduced Ampere, our new GPU. It's 28 billion transistors, 28 billion. It's in Samsung's 8N Custom Process, connected to the world's fastest memory G6X and delivers 2x perf Gen to Gen. Ampere powered on in our labs this last May and is now in volume production. It has been an amazing execution by the team, proud to be a part of the -- proud to watch in times of COVID, just amazing execution.

Full stack engineering and craftsmanship is the heart of all of our GPUs and Ampere is no exception. The goal to squeeze every drop of perf and power efficiency up and down the stack. Ampere delivers 1.9x more power efficiency in turing. This extends our ability to operate in low-power systems and scale higher performance with power.

So today, we announced our new flagship GPU, the RTX 3080. At \$699, it has 10 gigabytes of the world's fastest memory. It's a generational leap, it is super important when launching a new GPU. This inspires developers to push realism on a much larger footprint, and of course, for gamers, to upgrade. The 3080 is available September 17.

As you know, our first Gen RTX turned, while groundbreaking and setting the stage for a revolution in graphics and gaming, did not quite achieve this Gen to Gen perf over Pascal. 3080, our second-gen RTX and designed in Samsung's 8N, is designed to deliver amazing perf for current and next-generation games and inspire gamers that now is the time to upgrade.

This chart shows a 3080 at \$699 stacked above 980, 1080 Ti and 2080 Super, and delivers roughly 2x the Perf of our 2080 that was launched just two years ago.

The second GPU we announced is the RTX 3070. The 70s are some of our most important products. The 3070 is priced starting at \$499 and will be available in October. It has 8 gigabytes of G6 memory. The 3070 at \$499 is faster than our 2080 Ti, incredible value. Once again, the 3070 is designed to inspire developers and gamers alike, delivering great perf over turing and a clear choice for gamers to upgrade.

Finally, we launched a big ferocious GPU, what we affectionately call the BFGPU, our 3090. Realizing that our Titan class products were in high demand, enthusiast creators and researchers were using it to power their gaming rigs and workstations, we decided to add a 90 class this cycle, our first ever, at the top of the GeForce stack and to sell it through our worldwide AIC channels. It is a beast of the GPU and it's priced starting at \$1,499. It is the first GPU that will support 8-K 60 frames per second and with ray tracing on. The 3090 will be available from partners at the end of the month, starting September 24.

So all in all, the key note covered a lot of material. NVIDIA delivers the greatest ever generational leap with their 30 series GPUs. Ampere is more than a chip. It's a stack that powers the top game engines and creator apps. Ampere is our second-generation RTX arch, well ahead of the industry, leading the industry, with three dedicated cores that is delivering 2x the perf and power efficiency. Three cores, 2x, once again, our triple-double.

We also delivered new tools for the infinite ways that gaming is expanding. As noted, gamers are not just gamers anymore, they're creators, they're competitors, they connect socially all important elements of gaming, and the GeForce platform continues to deliver. This is for the tens of millions of streamers, broadcasters, Esports pros, artists and creators.

We did this with our new applications for Esports NVIDIA Reflex, delivering low latency gaming for the millions of Esports gamers, NVIDIA Broadcast for the millions of GeForce broadcasters who are streaming their games. And finally, NVIDIA

Omniverse Machinima allowing gamers and creators to take in-game assets combined with their web camera and other visual effects libraries to create cinematic film quality storytelling from game assets. This will be -- we believe Machinima will truly be groundbreaking.

So thank you all for your time today. Hopefully we covered everything, although there is one more point I want to make. Sorry. Finally, RTX is on and this is probably one of the most important things. When we launched RTX, we wanted to inspire developers. RTX real-time ray tracing is now coming to Fortnite. With both Minecraft and Fortnite onboard, the number one and two most played games in the world RTX on, adding the most anticipated titles this fall, Cyberpunk, Call of Duty, Black Ops and Watch Dogs, there is no question that RT is the new standard for games.

Okay, with that, I wanted to say, thank you all for your attention and we can open it up for questions. Simona?

**Simona Jankowski** {BIO 7131672 <GO>}

Yeah, thank you very much, Jeff. And operator, let's open up the line for any questions.

**Operator**

(Operator Instructions) Your first question comes from Vivek Arya from BofA Securities.

**Vivek Arya** {BIO 6781604 <GO>}

Hello, Jeff and Colette, it's Vivek Arya. Congrats on the launch and thanks for letting me ask a question. I actually had two, one for Jeff and one for Colette. Jeff, how large do you estimate your deployed base of gamers is, and how do you see this upgrade cycle playing out versus what you saw with versus what you saw with Turing and Pascal, and do you think this is more of a unit or ASP-driven cycle?

And if I could just also squeeze in my question for Colette at the same time. Colette, you mentioned working with Samsung for this new product launch and I'm wondering how do you think about just kind of the cost and benefit of working with two different foundries for your Ampere set of products? Thank you.

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Should I start?

**Simona Jankowski** {BIO 7131672 <GO>}

Yeah, go ahead, Jeff, why don't you start first?

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**Jeffrey D. Fisher** {BIO 2373419 <GO>}

All right. Yeah, thanks, Vivek, and thanks for your comment about the launch. We were pretty excited about Ampere. Yeah, we -- I believe that as with typical -- as with prior transitions and as we've seen three of our business that will -- we will see both unit and ASP benefits in Ampere. Gamers continue to want to buy up the stack and I think we're delivering a pretty compelling upgrade opportunity for gamers.

In terms of the installed base, there are roughly 200 million GeForce gamers out there. We -- if I look at our installed base of gaming PCs, about 30%, maybe a little less, have actually moved to Turing. So there is still a large upgrade opportunity for Ampere.

We're also seeing the user base grow. I don't -- you know COVID certainly has created more energy around gaming, but it's been the trajectory of gaming over time that more and more gamers are coming to PC gaming, and we don't see that stopping anytime soon.

**Colette Kress** {BIO 18297352 <GO>}

Yeah, so Vivek, in terms of the question regarding Samsung, as we've discussed now for several years that we've been working with a dual-fab approach and working with the dual-fab approach really talks about creating teams on both sides to work with the overall fabs. It's not necessarily about at the time you're ready to launch or to be able to merge to production.

So these teams to understand each in processes and all of the great things that both of these fabs provide. We're honored to now be working with both of the high-end and really strong partnerships that are out there with TSMC and Samsung. Our decision on this side to take the gaming overall piece to Samsung is really about their higher performance that they could provide on their 8-nanometer, which has been customized now here to NVIDIA. So we'll continue to work on a dual-foundry strategy, we actually think is probably just best practice now out in the market. And keep in mind, Samsung has also been a part of many of our gaming products in the past. So this is just a continuation on building upon the teams that have been created on both sides.

**Vivek Arya** {BIO 6781604 <GO>}

Thank you.

**Operator**

Your next question comes from Aaron Rakers from Wells Fargo. Your line is open.

**Aaron Rakers** {BIO 6649630 <GO>}

Yeah, thanks for taking the questions and also congratulations on the launch, a very impressive. Just going back to kind of the earlier question, I know you just mentioned that approximately 30% or less of the GeForce installed base is on Turing, but pretty clearly, the commentary today was that, there is a large installed base of Pascal users and obviously strong performance metrics around this. So, can you just help us understand of how much the age of the installed base, how much is sitting on Pascal or even prior generations of that?

And then as a quick second question, just curious as you kind of change the strategy at the high-end with the 3090 products versus the prior Titan, how big of a piece of mix in Titan been in the past and how much could that possibly change now that you more broadly have the 3090 in the market? Thank you.

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Yeah. So if you look at our installed base, I mean, on Steam, for example, I think over 20%-- high 20% of Steam gamers are on Turing. So all the rest would be on prior generations, Pascal or earlier. I see all that is upgrade opportunity for Ampere.

We -- let's see, second question, I think that is about 3090, so Titan it's -- Titan was constrained, was sold on NVIDIA.com and through a couple of system integrators. It's hard to really know what the potential is of Titan. But if I combine the Titan and 2080 Ti class of product where 3090 kind of sits in the middle of those two, it's -- I guess, a meaningful part of our business collectively, and we think that that both the combination 2080 Ti, Titan buyers and as well as inspiring some new buyers will come into that space.

**Aaron Rakers** {BIO 6649630 <GO>}

Thank you.

**Operator**

Your next question comes from Toshiya Hari from Goldman Sachs. Your line is open.

**Charles Long** {BIO 20098365 <GO>}

Hi, this is Charles on for Toshiya. Thanks for taking the question and congrats. I had one around gross margins. So I think historically you guys have benefited from obviously Gen to Gen ASP increases, SKU mix across the different SKUs, and then on the no transition to wafer costs. With ASPs largely flat on the 70 and 80 generation, how should we think about the ceiling in terms of gross margin going forward? Is it more about mix across the SKUs or better way for pricing. Just wondering if we get some color on that, and then maybe part of that, with ASPs flat, how should we think about the ceiling and overall ASP growth going forward? Thanks.

**Colette Kress** {BIO 18297352 <GO>}

Sure, so let me start with an overall discussion about gross margin, and we'll see if Jeff wants to add a bit in terms of what we expect in terms of the ASPs. So you are correct that, Generation to Generation, we have continued to improve in terms of gross margin of the Company. A lot of that growth, whether that be with overall gaming or some of our other business lines, has really been about the higher-end platforms and the amount of software that is incorporated in them. That really allows us to continue to reach the high end of the markets with the overall customers.

In this case, when you think about our Ampere gaming, our Ampere gaming gross margins coming out are quite solid, quite good, and we've baked this into our guidance that we gave for Q3. So, it's still early to determine what we'll see over the life cycle of providing Ampere to gaming, but we probably expect some of those same things that we have seen with each Generation to come true. Number one, you'll see an upsell, you'll see that continued excitement to try and have the best of the best and we've done this over time where we get an average ASP, overall increase, as we move forward.

Additionally, over the time that the life and overall architecture, we talk about the increases and improvements that we see in the gross margins. That's everything from the overall value engineering of the components, but just over time, we tend to see an overall increase in those gross margins. So with that, I'll turn it over to Jeff to see if he wants to add more.

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Yeah, I think I believe value prop of Ampere will drive upsell. I would expect just to see some ASP lift as gamers are upgrading to higher class GPUs to get the best perf on future games. This IS what we've seen over time with prior Gens, and I don't expect that to stop with Ampere.

When we move to Turing, we had a brand new architecture in a similar node, and we struggled as I noted and it has been noted, we struggled to deliver great Gen-to-Gen perf. Groundbreaking architecture, but Gen to Gen perf on traditional games was not that compelling. Yeah, Turing delivered -- it was a great -- it was a successful product and delivered a great deal of growth. Ampere is -- benefits from the new node, our second-gen architecture. I think it's going to be a great upgrade cycle.

**Charles Long** {BIO 20098365 <GO>}

Great. Thank you. Good luck.

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Thanks.

**Operator**



Your next question comes from Stacy Rasgon from Bernstein Research. Your line is open.

**Stacy Rasgon** {BIO 16423886 <GO>}

Hi guys, thanks for taking my questions. I have two. First, I think similar to what we saw with Turing, with Ampere, you see the starting in both the high end of the stack, when do you think we might see more of the mainstream offerings coming, I guess the equivalent in the prior gen NVIDIA like the 1600 series.

And secondly on given these purchase versus available in a few weeks kind of end of September, how do you foresee the supply situation? Do you believe that you have enough supply in the market to satisfy the demand that you're forecasting?

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Thanks, Stacy, always good to hear from you.

**Stacy Rasgon** {BIO 16423886 <GO>}

Thank you.

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

In terms of timing of the launch and the rollout of products, I think you've seen, when Turing, it came out, we rolled out product slower than we probably anticipated or could have and that was a unique time for our business. As you know, we take great deal trying to care about channel and we wanted to make sure that we had sold through prior product before we rolled out some new generation products at different price points.

With Ampere, the channel is healthy and the business is strong and we are prepared for a pretty healthy cadence on rolling out new devices. I think you'll see Ampere's cadence of new parts to be faster than what you saw on Turing.

**Stacy Rasgon** {BIO 16423886 <GO>}

Got it. And the supply and the launch --

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Yeah, you know that, whenever we launch a new product, as compelling as Ampere is, there is -- there will no doubt be shortage of product. We just can't -- you can't ramp a fab to follow that front-loaded demand of new buyers that quickly. So that said, we have a great relationship with Samsung. The product is in volume production. We've begun shipping to our channel partners, and you will start -- you will see volume product hitting the shelves starting on the dates that we've

announced, and it will naturally, as entire supply chain ramps, continue to grow as we get toward the holiday season.

**Stacy Rasgon** {BIO 16423886 <GO>}

Got it. I appreciate it. Thank you so much.

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Sure.

**Operator**

Your next question comes from Harlan Sur from JPMorgan.

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

Good afternoon. Thanks for hosting this event and good to see the impressive performance with the 30 series mix. You know, one of the big drivers of gaming franchise for the team has been the strong adoption of gaming laptops, especially with your Max-Q based designs for gaming notebooks. Help us understand the cadence like when are we going to see the 3070 and 3080 based Max-Q notebooks? Will that be for the next notebook refresh cycle middle of next year or can we see it sooner?

And then just as a follow-up, what percentage of your enthusiast class gaming segment is made up of gaming notebook based platforms?

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Okay, so the first question, and I will let Colette tackle the second. The first question, you know, Ampere, as we talked about the -- the performance and power efficiency of Ampere is really great, and as we work our way down the stack, we're super excited to see Ampere come in to notebooks at some point in the future. We don't have any announcements today. I'd like to say, it'll be sooner rather than later, but I'm not allowed to give you guys any dates and prefer not to at the time. But I think the Ampere laptops are really going to kill it and we're looking forward to announcing those at a future time.

**Colette Kress** {BIO 18297352 <GO>}

Yeah, so let me address the question regarding our laptops and our laptops as a percentage of our gaming business. We have multiple different platforms that we take to market for our overall gamers. Our standard desktop offerings that we're announcing today, our overall laptops, our overall consoles and also what we see in terms of GeForce now as well. Our laptops have grown quite well. Our laptops have grown consecutively for many quarters, I think up to about 10, and what we're seeing

right now is our laptops is really changing the overall seasonality of what we have to that business.

We're seeing right now, I think in the last quarter, still less than 30% of our business, so less than 30% of our business, so it's a great opportunity to attract more gamers with a different platform that they need their niche, not necessarily shelf building or refreshing, rather having something that they can be mobile. So stay tuned, more to definitely come with our laptops.

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

Great, thank you.

**Operator**

Your next question comes from Matt Ramsay from Cowen. Your line is open.

**Matt Ramsay** {BIO 17978411 <GO>}

Thank you very much. Good afternoon. Jeff, I had a couple of questions for you, and the first one, you had mentioned when you guys rolled out Turing, some of the performance stats weren't maybe what you had hoped, but there is a big generational change on the software side with ray tracing and RTX, and from my point of view, there was a bit of a chicken and egg, do the developers go to RTX or wait for the product et cetera? Maybe you could talk a little bit about what percentage of the gaming installed base today is on RTX-enabled games from, I don't know what metrics might make sense, number of hours, number of users et cetera, and how you see that software development side being prepared for the Ampere launch versus where we were when Turing launched?

And then the second question and maybe you could talk a little bit about the level of importance of the new DRAM architecture to the product stack. Any sense for how important that is, if you had any anecdotes there, that'd be appreciated. Thank you.

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Okay. Yeah, on RTX, I mean it's really become a new standard for games. Back in the Turing day, developers found out about RTX about the same time you guys did. Of course, we had been talking to you on paper, but we didn't have any silicon we could give them to start innovating with in advance of that start creating games that would run on RTX. Of course, we have worked with Microsoft earlier than that to get DXR to get their standard APIs up for iteration, but it was all pretty much on paper until RTX arrived.

So two years later, I mean, the world has completely changed. As you guys know, both consoles are going to be supporting RT. Developers are investing heavily now in the next generation of games that will all support RT cross-platform. Fortnite has announced that in the current chapter, they will be turning on RT in the near future.

Minecraft has got RT, and as you can see the pipeline of all new games coming this fall support ray tracing.

So I think we are -- the tipping point if you call it is now passed and the future gaming is really going to include RTX and ray tracing. It's just a completely different world from where we kicked this all off and launched Turing two years ago.

You asked about memory as well. Let's see. So we've been working with Micron for the last several years. Memory architecture and memory speeds are fundamental to graphics performance. You need a fast memory system and if we've delivered on that in the last several generations, G5X, we developed with Micron, G6, and now G6X. So memory speeds are differentiating and they do allow you to really take full advantage of the graphics pipeline, new graphics architecture and we're super excited of working with Micron on G6X.

## Operator

Your next question comes from Brett Simpson from Arete Research.

### Brett Simpson {BIO 3279126 <GO>}

Yeah, thanks very much. Jeff, I just had a clarification on the Samsung 8N process. Are you saying that all the GeForce, all Ampere GeForce cards will run Samsung? Just wanted to clarify that one. And then maybe just as a follow-up, I see you're offering 12-month free GeForce NOW when you buy a Founders Edition card, an Ampere Founders Edition card, does -- I'd just be interested in your perspective, this scaling of GeForce NOW maybe hold back hardware update activity around Ampere, maybe you can just give us an idea how you're thinking about this, and just maybe on the GeForce NOW service, how -- what will Ampere do for GeForce NOW, does it support virtualization, for example, and that's the key feature in the A100. So maybe just -- if you can touch on that, that would be great. Thank you.

### Jeffrey D. Fisher {BIO 2373419 <GO>}

Okay. Let's see, 8N you asked about and all the devices we've announced today run in Samsung 8N, are built on in Samsung 8N and that -- I don't see that changing in the future, and 8N is a great process, Samsung has been a great partner, and GeForce versions of Ampere that we have announced will all run -- will all be built in Samsung 8N.

The question about GFN, maybe these questions are just so different, I've got to switch gears between them. The question on GFN, yeah, we -- GFN is doing great. We're really pleased with the momentum. We're pleased with all of the developer support. It's got a passionate community. And it is designed to offer folks who have low-end gaming PCs and with traditionally our gamers but will traditionally not otherwise invest in a gaming rig, give them access to PC gaming, -- and that message has resonated. And you know, folks who just just enabled Chromebooks, anybody with the Chromebook can now play high-end PC game on their

Chromebook and as you know there is tens of millions of kids now that have Chromebooks in their hands.

The question about cannibalization or thinking behind the bundle, I mean, our thinking is Ampere -- folks who buy Ampere, folks who buy GeForce, it is not their only PC. They also own a Chromebook. They own a laptop. They have a family member who doesn't have a high-end rig they want to play with.

So the idea of bundling with Ampere is discovery and also to give GeForce gamers the entitlement to use GeForce NOW to play PC games on other systems -- on lower end systems and we think it's going to be a great campaign, a great success (Multiple Speakers) Go ahead.

**Brett Simpson** {BIO 3279126 <GO>}

Sorry, you kind of answered (Technical Difficulty)

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Okay. I'm sorry your second question, but you had asked about how the Ampere affects GFN. There is nothing. GFN is -- plays on any client and it plays on the Ampere well. There is no specific Ti to Ampere as a client. In terms of virtualization, Ampere in the cloud, GFN runs multiple sessions on a GPU today and we're looking forward to ultimately including Ampere in the stable of hardware that's running GFN.

**Brett Simpson** {BIO 3279126 <GO>}

Okay, great, thanks very much.

**Operator**

And our last question will come from John Pitzer from Credit Suisse. Please go ahead.

**John Pitzer** {BIO 1541792 <GO>}

Yeah, good afternoon,guys, thanks for allowing me to ask the question. I have one for Jeff, and one for Colette. Jeff, I am just going to go back to the Tensor Core part of the Ampere architecture. It sounds like that's being used as almost an acceleration engine for GPU rendering, but I'm kind of curious to the extent that your AI algorithms are becoming more important on the rendering side, does that have sort of potential benefits back to the content creation side? Does it create deeper modes relative to the content creators and how well games run on your GPU versus other GPUs?

And then Colette, just on the pricing side, I know there's a lot of things that go into your pricing strategy. I think the ASP on the 30 series surprised people a little bit. I'm kind of curious to what extent was that a reflection of the competitive environment or

is this really just recognition that you want to grow the market, and as a point of clarification, at sort of scale, do you think the gross margins on the 30 series will be comparable or better than prior series? Thank you.

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Okay. AI, yeah, so we've been investing in AI for years, I mean most of the news has of course been in on the continued data center side, but for AI for graphics, there's a huge team that has been researching in development technology related to AI for graphics and it's not just -- it's not DLSS, it's probably the most visible thing that we talk about and the first real incarnation, and as we've said, I think you've read, DLSS 2.0 is now getting pretty rave reviews for the image quality and performance. And it's a super important technology for playing ray trace games at high performance, at high frame rates. And the reason for that is because ray tracing takes more horsepower to render and then AI can up-scale and deliver the same or better image quality at that higher performance filling in pixels, if you will.

Tensor cores allow you to do that at Lightspeed, super fast. So the burden of upscaling and at similar IQ is extremely low. But other forms of AI are also developing. I mean, we announced our RTX, our NVIDIA Broadcast, which uses Tensor Core AI or Greenscreen for noise reduction and that's just the tip of the iceberg. There are so many ways that AI will ultimately allow you to interact with your -- with characters in your game for in-game mechanics to operate more naturally. And Tensor Cores, we believe, are going to help facilitate those types of technologies to occur in real time.

**Colette Kress** {BIO 18297352 <GO>}

Yeah, so let me see if I can answer your question regarding the overall pricing and what's our goal with the overall pricing? I think one of the things to see right now with the gaming architecture with Ampere and what the goals of it is, we're going after a very important expansion that we have started to develop even over this last year and over those several years. It's not just about playing back overall game. It is about the overall Esports and how they overall watch the overall storage. How they share the overall clientele that they are working on. How they teach others and how overall build on so much of the performance that they are doing on the game?

So looking at that broad spectrum, we have now come out with a great set of overall cards at price points that we can attract every single person into that market. So the expansion of the types of gamers and how they are using our overall gaming GPUs, really talks about the price points that we are doing.

Your second piece of that was about the gross margins and the gross margins as comparison to overall Turing. As we discussed, what we see and what we saw with Turing is a continued improvement over those gross margins over time. But some of that's really hard to kind of lookout. Some of the things that influence that is also just the overall components pieces of it, the overall costs of the overall memory that we have, that's incorporated in that. So it's very hard to actually look at this in terms of going forward. Comparing where we are with gaming Ampere versus where we are

with Turing, and Turing that has been in market for more than two years, is kind of a little bit of an apple-and-orange. We'll continue to work through the exact same kind of process and things that we do in terms of improving our gross margins as we go forward, but we feel really good about the gross margins in terms of where they sit today and keeping in mind that mix is one of the largest drivers of our overall gross margin as a whole, I think we'll be in a good position.

**John Pitzer** {BIO 1541792 <GO>}

Thank you.

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Was that the last question?

**Operator**

And that was our last question at this time.

**Jeffrey D. Fisher** {BIO 2373419 <GO>}

Okay, yeah. I wanted to thank everybody for joining our call today and joining the keynotes. I just got a note that our keynote has been watched in 183 countries in total. We've had millions of viewers. It's trending number one on Twitter, just pretty amazing, #UltimatePlay.

Today, we announced our second-generation RTX Ampere, super excited about our triple double, three cores, 2x Perf, providing gamers more ways to play with Reflex, Broadcast and Machinima. And once again, RTX on is the new standard. Fortnite coming to RT along with all the top fall games, we're expecting for a great product cycle. Can't wait to get back together with you guys at some point in the future, and take a look at back at what we've started with the Ampere launch. So, thank you, all.

**Operator**

This concludes today's conference call. You may now disconnect.

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