Q2 2022 Earnings Call

Company Participants

- Colette Kress, Executive Vice President and Chief Financial Officer
- Jensen Huang, Founder, President and Chief Executive Officer
- Simona Jankowski, Investor Relations

Other Participants

- Aaron Rakers, Analyst
- C.J. Muse, Analyst
- Chris Caso, Analyst
- Harlan Sur, Analyst
- John Pitzer, Analyst
- Matt Ramsay, Analyst
- Stacy Rasgon, Analyst
- Vivek Arya, Analyst
- William Stein, Analyst

Presentation

Operator

Good afternoon. My name is Mel, and I will be your conference operator today. At this time, I would like to welcome everyone to the NVIDIA's Second Quarter Earnings 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. Good afternoon, everyone, and welcome to NVIDIA's conference call for the second quarter of fiscal 2022. With me today from NVIDIA are Jensen Huang, President and Chief Executive Officer; and Colette Kress, Executive Vice President and Chief Financial Officer.

I'd like to remind you that our call is being webcast live on NVIDIA's Investor Relations website. The webcast will be available for replay until the conference call to discuss our financial results for the third quarter of fiscal 2022. The content of today's call is NVIDIA's property. It can't be reproduced or transcribed without our prior written consent.

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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 the disclosure in today's earnings release, 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, August 18, 2021, based on information currently available to us. Except as required by law, we assume no obligation to update any such statements. During this call, we will discuss non-GAAP financial measures. You can find a reconciliation of these non-GAAP financial measures to GAAP financial measures in our CFO commentary, which is posted on our website.

With that, let me turn the call over to Colette.

Colette Kress {BIO 18297352 <GO>}

Thanks, Simona. Q2 was another strong quarter with revenue of $6.5 billion, and year-on-year growth of 68%. We set records for total revenue, as well as for Gaming, Data Center and Professional Visualization.

Starting with Gaming. Revenue was $3.1 billion was up 11% sequentially, and up 85% from a year earlier. Demand remained exceptionally strong outpacing supply. We are now four quarters into Ampere architecture product cycle for gaming. They continued to be robust ever. At Computex in June, we announced two powerful new GPUs for gamers and creators; the GeForce RTX 3080 Ti and RTX 3070 Ti, delivering 50% faster performance than their prior generation with acclaimed features such as real-time ray tracing, NVIDIA DLSS, AI Rendering, Reflex and Broadcast.

Laptop demand was also very strong. OEMs adopted Ampere architecture GPUs and a record number of designs. From the top of the line gaming laptops to those two mainstream price points as low as $799, that bring the power of GeForce CPUs to gamers, students and creators on the go [ph]. Ampere architecture powered laptops feature our third generation Max-Q power optimization technology that enables ultra tech [ph] designs, such as the new Alienware x15, the worlds most powerful sub-60 millimeter gaming laptop.

NVIDIA RTX technology has reset computer graphics and spurred our biggest ever wafer cycle. Ampere spend our fastest ramping gaming GPU architecture on stream and the combination of Turing and Ampere RTX GPUs have only upgraded about 20% of our installed base. 80% of yet to upgrade to RTX. And the audience for global e-sports will soon approach by 0.5 billion people, while the number of those who live stream games is expected to reach over 700 million. The number of PC gamers on stream is up almost 20% over the past year. More than 60 RTX games now support NVIDIA's RTX ray tracing or DLSS, including today's biggest game franchises such as Minecraft, Fortnite and Cyberpunk. New RTX games this quarter includes that Red Dead Redemption 2, one of the top-rated games of all-time, popular titles like Rainbow Six Siege and Rushed [ph] and

Minecraft RTX in China with over 400 million players. The competitive gamers NVIDIA Reflex, which include latency is now supported by 20 games.

Let me say a few words on Cryptocurrency Mining. It is an effort to address the needs of liners and direct GeForce to gamers, we increased the supply of Cryptocurrency Mining Processors or CMP, and introduced low hash rate GeForce GPUs with limited Ethereum mining capability. Over 80% of our Ampere architecture based GeForce shipments in the quarter were both hash rate GPUs. The combination of crypto to gaming revenue is difficult to quantify. CMP revenue, which is recognized in OEM was $266 million, lower than our original $400 million estimate on reduced mining profitability, and we expect a minimal contribution from CMP going forward. GeForce NOW reached a new milestone this quarter, surpassing 1,000 PC games more than any other cloud gaming service. The premium tier is available for a subscription of $10 per month getting gamers access to RTX class performance even on an underpowered PC, Mac, Chromebook, IOS or Android device.

Moving to Pro Visualization. Q2 revenue was a record $519 million, up 40% sequentially, and up 156% year-on-year. Strong sequential revenue growth was led by desktop workstations driven by demand to outfit design offices at home as remote work becomes the norm across industries. This is also the first big quarter of the Ampere architecture ramp for pro visualization. Key verticals driving Q2 demand include, automotive, public sector and healthcare.

At scene [ph] graph last week, we announced an expansion of NVIDIA Omniverse or simulation and collaboration platform that provides the foundation of the metaverse. Through the new integrations with lender, the world's leading open source 3D sound emission tool and Adobe, we're opening the Omniverse platform to millions of additional users. We are also collaborating with Apple and Pixar to gain advanced physics capabilities to Pixar's Universal Scene Description framework, embracing open standards to provide 3D workflows to billions of devices.

Omniverse enterprise software is in the early access stage and will be generally available later this year on a subscription basis from NVIDIA's partners, including Dell, HP, Lenovo, and many others. Over 500 companies are evaluating Omniverse enterprise, including BMW, Verizon and Lockheed Martin. And more than 50,000 individual creators have downloaded Omniverse, since it entered open beta in December.

Moving to automotive. Our Q2 revenue was $152 million, down 1% sequentially, and up 3% year-on-year. Sequential revenue declines in infotainment were largely offset by growth in self-driving. Looking further out, we have substantial design wins start to ramp that we expect will drive a major inflection in revenue in the coming years. This quarter we announced several additional wins. Self driving startup AutoX unveiled its latest autonomous driving platform for robotaxi powered by NVIDIA DRIVE. The performance and safe capabilities of the software defined NVIDIA DRIVE platform has enabled AutoX to become one of the first companies in the world to provide full self driving mobility services without the need for a safe to drive on [ph].

In autonomous trucking, DRIVE ecosystem partner plus signed a deal with Amazon to provide at least 1,000 self driving system to Amazon's fleet of delivery vehicles. These systems are powered by NVIDIA DRIVE for high performance, energy efficient and centralized AI compute. An autonomous trucking startup embark is building on NVIDIA DRIVE. The system is being developed for trucks for four major OEMs; Freightliner, Navistar International, PACCAR and Volvo, representing the vast majority of the Class 8 or largest size trucks in the US. The NVIDIA DRIVE platform is being rapidly adopted across the transportation industry from passenger-owned vehicles to robotaxi, to trucking and delivery vehicles. We believe everything that moves will be autonomous from gaming.

Moving to Data Center. Revenue of 2.4 billion, grew 16% sequentially and 35% from the year ago quarter. The year ago quarter, which was our first quarter to include Mellanox. Growth was driven by both hyperscale customers and vertical industries each of which has record revenues. Our flagship A100 continue to ramp across hyperscale and cloud computing customers with Microsoft Azure announcing general availability in June, following AWS and Google Cloud platforms general availability in prior quarters.

Vertical industry demand was strong with a sequential growth led by financial services, supercomputing and telecom customers. We also had exceptional growth in inference, which reached a record, more than doubling year-on-year. Revenue from inference focus processors includes the new A30 GPU, which provides four times the inference performance of the T4. Customers are also turning to NVIDIA GPUs to take AI to production and shifting from CPUs to GPUs, driven by the stringent performance latency and cost requirements of the point and scaling deep learning AI workloads.

NVIDIA's networking products posted solid results. We see momentum across regions driven by our technology leadership with upgrades to high speed products such as conductor 6 [ph] as well as new customer wins across cloud, service providers, enterprise and high performance computing. We extended our leadership with Supercomputing, the latest TOP500 list shows that NVIDIA technologies power 342 of the world's top 500 supercomputers, including 70% of all new systems and eight of the top 10. To help companies harnessed the new industrial high performance computing obligation, we need to deliver a turnkey AI data center solution with the NVIDIA DGX SuperPOD, the same technology that powers for new Cambridge-1 supercomputer in the UK, and a number of others in the top 500.

We expanded our AI software and subscription offerings making it easier for enterprises to adopt AI from the initial development stage through to deployment and operations. We announced NVIDIA Base Command. Our software-as-a-service offering for operating and managing large scale multi-user and multi-team AI development workloads on DGX SuperPOD. Base Command is the operating and management system software for distributed training customers. We also announced general availability of NVIDIA Fleet Command, our managed edge AI software-as-a-service offering to command help companies solve the problem of securely deploying and managing AI applications across thousands of locations combined the efficiency and simplicity of central management with the cost performance and data sovereignty benefits of real-time processing at the edge.

Early adopters of Fleet Command include some of the world's leading retail, manufacturing and logistics companies and the specialty software companies that work with them. The new NVIDIA Base Command and Fleet Command software and subscription offerings followed last quarter's announcements of the NVIDIA AI enterprise software suite, which is in early access with general availability expected soon. Our enterprise software strategy is supported by the NVIDIA-Certified Systems program with server OEMs, which are bringing to market over 55 systems ready to run on NVIDIA's AI software out of the box to help enterprise simplify and accelerate their AI deployment.

The NVIDIA ecosystem keeps getting stronger. NVIDIA inception, our acceleration platform for AI start-ups just surpassed 8,500 members. With cumulative funding of over 60 billion and numbers in 90 countries inception is one of the largest AI startup ecosystems in the world. CUDAC [ph] now has been downloaded 27 million times, since it launched 15 years ago, with 7 million in the last year alone. In terms RT for inference has been downloaded nearly 2.5 million times across more than 27,000 companies. And the total number of developers in the NVIDIA ecosystem now exceeds 2.6 million, up four times in the past four years.

Let me give you a quick update on Arm. In nearly one-year, since we initially agreed to combine with Arm, we have gotten to know the company, its business and its people, much better. We believe more than ever in the power of our combination and the benefits, it will deliver for Arm, for the UK, and for its customers across the world in the era of AI. Arm has great potential. We love their business model and committed to keep its open licensing approach. And with NVIDIA's scale and capabilities Arm will make more embedded customers, while expanding into data center, IoT and other new markets.

NVIDIA accelerate computing, which starts with the CPU. Whatever new markets are open with the CPU and our accelerated computing opportunities, we've announced accelerated platforms for Amazon Graviton, Ampere Computing, MediaTek and (inaudible), expanding cloud computing, AI, cloud gaming, supercomputing, edge AI to Chrome PCs. We plan to invest in the UK, and we have with the Cambridge-1 Supercomputer, and through Arm making UK a global center in science, technology and AI. We are working through the regulatory process, although some Arm licensees have expressed concerns and objected to the transaction. And discussions with regulators are taking longer than initially thought. We are confident in the deal and that regulators should recognize the benefits of the acquisition to Arm is licensees and the industry.

Moving to the rest of the P&L. GAAP gross margin of 64.8% for the second quarter was up 600 basis points from a year earlier, reflecting the absence of certain Mellanox acquisition-related costs. GAAP gross margins was up 70 basis points sequentially. Non-GAAP gross margins was 66.7%, up 70 basis points from a year earlier, and up 50 basis points sequentially, reflecting higher ASPs within desktop, GeForce, GPUs and continued growth in high end Ampere architecture products, partially offset by a mix shift within data center. Q2 GAAP EPS was $0.94, up 276% from a year earlier. Non-GAAP EPS was $1.04, up 89% from a year earlier. Adjusting for the four-for-one stock split, effective this quarter, Q2 cash flow from operations was a record $2.7 billion.

Let me turn to the outlook for the third quarter of fiscal 2022. We expect another strong quarter. We center with sequential growth driven largely by accelerating demand in data center. In addition, we expect sequential growth in each of our three other market platforms. Gaming demand is continuing to exceed supply as we expect channel inventories to remain below target levels as we exit Q3. The contribution of CMP to our revenue outlook is minimal. Revenue is expected to be $6.8 billion, plus or minus 2%.

GAAP and non-GAAP gross margins are expected to be 65.2% and 67%, respectively, plus or minus 30 basis points. GAAP and non-GAAP operating expenses are expected to be approximately $1.96 billion and $1.37 billion, respectively. GAAP and non-GAAP other income and expenses are both expected to be an expense of approximately $60 million, excluding gains and losses on equity securities. GAAP and non-GAAP taxes are supposed to be expected from 11% [ph] plus or minus 1%, excluding discrete items. Capital expenditures are expected to be approximately $200 million to $225 million. Further financial details are included in the CFO commentary and other information available on our IR website.

In closing, let me highlight upcoming events for the financial community. We will be attending the following virtual events with BMO Technology Summit on August 24; the new street big ideas in semiconductors Conference on September 9th; the Citi Global Tech Conference on September 13th; the Piper Sandler Global Technology Conference on September 14th; and the Evercore ISI Auto Tech and AI Forum on September 21st. Our earnings call to discuss the third quarter results is scheduled for Wednesday, November 17th.

We will now open the call for questions. Operator, would you please poll for questions.

Questions And Answers

Operator

Thank you. (Operator Instructions) Your first question comes from the line of Vivek Arya of Bank of America. Your line is now open. You may ask your question.

Q - Vivek Arya {BIO 6781604 <GO>}

Thanks for taking my question. I actually had a near and longer term question on the Data Center. I think near-term, you mentioned the possibility of accelerating data center growth from the 35% rate. I was hoping if you could give us some more color around that confidence and visibility. And then longer term, Jensen, we have seen a lot of announcements from NVIDIA about your enterprise software opportunity. I honestly don't know how to model that. It sounds very promising, but how should be model it? What problem are you trying to solve? Is it cannibalizing demand, you might have otherwise seen from your public cloud customers, or is this incremental to grow? So just any guidance or any just insights into how to think about NVIDIA's enterprise software opportunity longer term? Thank you.

A - Jensen Huang

Yes, Vivek, thanks for the question. We are seeing accelerated -- or as we've already reported that we have record revenues in both hyperscale cloud and industrial enterprise this last quarter. And we're seeing accelerated growth. The exploration [ph] in hyperscale and cloud comes from the transition of the catalyst providers in taking their AI applications, which are now heavily deep learning driven into production. There were some of the things that we've spoken about in the past that, that we will make some very good ideal platform to scale-out with. And if my learnings are (inaudible). The several platforms -- the several airlines of our platform, number one, Ampere GPU, which is known Universal GPU for AI, for training, but incredibly good for (inaudible). It's terrific and it's throughput, it's terrific, and it's as fast response time as well. And therefore the cost of deployment, the cost of operating in AI applications is the lowest.

The second is the introduction of Tensor RT, which is our optimizing compiler, that makes it possible for us to compile and optimize any AI application to our GPUs. And whether it's Computer Vision or Natural Language Understanding, or Conversational AI, recommender systems, the type of applications that are deploying AI is normally quite vast. And then lastly, this software inference server that we have to call Triton, which supports every one of our GPUs, it supports GPUs as well as GPU's. So, every Internet service provider could operate their entire data center using Triton. These several things are really accelerating a growth, which is, so the first element is the deployment of transition of deep learning AI applications into large-scale deployment.

In the enterprise, the application that is driving AI, as you know every enterprise must be want to move and raise towards being a tech company and take advantage of connected clouds and connected devices and artificial intelligence to achieve it. And we have an opportunity to deploy AI services out of the edge. And in order to do so, there are several things that has to happen; first, we have to create a computing platform that allows them to do training in the IT environment that they understand, which is a virtualized, which is largely managed by VMware. And our collaboration with VMware are creating a new type of systems that to be integrated in the enterprise has been in quite a significant effort and it's in volume production today.

The second is a server that allows the enterprise customers to deploy their AI models out to the edge. And the AI engine, the software suite, that we've been developing over the last 10 years now have been integrated into this environment and allows the enterprises to basically run AI out of the box. There are three elements of our stock split [ph] product there. First is NVIDIA AI enterprise, and that puts, that basically puts all of the state-of-the-art AI solvers and engines and libraries that we've industrialized and perfected over the years, made it available to enterprise nicely.

Second is a operating system platform called Base Command that allows for distributed scale software development in the -- for our training and development models. And then the third is Fleet Command, which is a operating system software product that let's you operate and deploy and knowledge the AI models out to the edge. These three software products in combination with the server called NVIDIA-Certified taken out through our network of partners is our strategy to accelerate the adoption of AI by the enterprise customers.

And so we are really enthusiastic about entering into the software business model. This is the an opportunity that could represent of course tens of millions of servers. We believe all of them will be GPU accelerated. We believe that enterprises will be deploying and taking advantage of AI to revolutionize the industry, and using quite traditional enterprise software licensing business model. This could represent billions of dollars business opportunity for us.

Operator

Thank you. Next question comes from the line of Stacy Rasgon of Bernstein. Your line is now open. You may ask your question.

Q - Stacy Rasgon {BIO 16423886 <GO>}

Hi, guys. Thanks for taking my questions. I wanted to go back collect the sequential guidance, you gave a little bit of color by segments. And although look at your gaming revenues, it's currently three quarters in a row you've been up call it ballpark 10% or 11%. And my understanding is that was sort of a function of your ability to bring on supply. So I guess what is the supply addition work like, as you're going from Q2 into Q3? And do you think you can still maintain that kind of sequential growth or does it dial down, because I also need to -- I also would say that we're going to other commentary suggesting that the sequential growth and I assume on the dollar basis was driven primarily by data centers. So, how do we think about the interplay within those comments sequential growth of gaming, especially given the trajectory is out of the last several quarters?

A - Colette Kress {BIO 18297352 <GO>}

Yeah, so let me start, but Jensen add a bit, Stacy to your question. Just for providing the guidance for Q3 of $6.8 billion in revenue. Now excluding CMP, we expect our revenue to grow over $500 million sequentially. Our lion's share about sequential revenue increased slightly on a sequential basis, but remember, we are still supply constrained. Automotive and Pro Vis are also expected to be up slightly quarter-over-quarter. And from a CMP perspective, we'll probably just have minimal amounts in Q3. So, our Q3 results don't have seasonality with some for gaming and are really about the supply that we believe we can have for Q3. We'll see if Jensen wants to add any more color.

A - Jensen Huang

Yeah. Thank you. Thanks for the question, Stacy. As you know, RTX is a fundamental reset of computer graphics. This is a technology coverage ratio that, that has been the holy grail of computer graphics for quite a long time from 35 years and research -- in our NVIDIA research for 10 years, we finally made it possible to do real-time ray tracing with RTX. RTX demand is quite incredible. And as you know, we have a large installed base of PC gamers, the new and architecture called GTX based on programmable shatters then we invented some 20 [ph] years ago. And now we reset in entire installed base and Ampere is of to just an incredible starting the best selling GPU architecture in the history of our company. And yet, we've only upgraded some 20%, less than 20% of our total installed base. So there's another 80% of the world PC gaming market that we have yet to upgrade to RTX.

Meanwhile, the number of PC gamers in the world grew substantially, still grew 20% this last year. And so I think the -- a world wide beginning of our RTX transition. Meanwhile, computing graphics is expanded into so many different new markets. RTX we've known, we've always believed we reinvent the way that people do design. And we're seeing that happening right now as we speak as workstations is growing faster than ever and has achieved record revenues. And at the same time because of all of our work with cloud gaming, we announced the public clouds, pretty cloud graphics, whether it's workstations or PC will probably gaining consoles up in the cloud. So we're seeing strong demand in PCs, in laptops, in workstations, in mobile workstations and cloud. And so RTX is really doing great work. Our challenge there is that demand is with so much growth in supply, and then as closely we'll do supply constraints.

Operator

Thank you. Next question comes from the line of Matt Ramsay of Cowen. Your line is now open.

Q - Matt Ramsay {BIO 17978411 <GO>}

Yes, thank you very much. Good afternoon, everybody. Before my question, Jensen, I just wanted to say congrats on the noise [ph] award, that's a big honor. For my question, I wanted to follow-on, on Stacy's question about supply. And Colette maybe you could give us a little bit of commentary around supply constraints in gaming in the different tiers or price tiers of your gaming cards. I'm just trying to get a better understanding as to how you guys are managing supply across the different price tiers? And I guess it translates into a question of, are the gaming ASPs that we're seeing in the October quarter guidance, are those what you would call sustainable going forward, or do you feel like that mix may change as supply comes online? Thank you.

A - Colette Kress {BIO 18297352 <GO>}

So, I'll start here. Thanks for the question on our overall mix, as we go forward. First, our supply constrained in our gaming business is largely attributed to our desktop and notebook, that can mean a lot of different things from our components that are necessary to build so many of our products. But our mix is really important. Our mix as we have also seen many of our gamers very interested in our higher-end higher performance products. We will continue to see that as a driver of that overall lifts both our revenue and can lift our overall gross margins. So there's quite a few different pieces into our supply that we have to think about, but we are going to try and make the best solutions for gamers at this time.

Operator

Thank you. Next question we have in line from C.J. Muse -- your line is -- from Evercore. Your line is now open.

Q - C.J. Muse

Yeah. Thank you. good afternoon. I guess a follow-up question on the supply constraints. When do you think that the lease? And how should we think about gaming into the

January quarter B2B typical seasonality given. I would assume you would continue to be supply constraints. Thank you.

A - Jensen Huang

Colette, if I can take it or you can, either one of them.

A - Colette Kress {BIO 18297352 <GO>}

Well, go ahead, Jensen, and I'll follow up if there are some other things.

A - Jensen Huang

Okay. What's the price in training process, and with supplied constrained graphics, what we're delivering record revenues in graphics. Cloud gaming is growing. Cloud graphics is growing. RTX made it possible for us to address the design in accretive workstations. Historically, the ray tracing and photo those images has largely been done on CPUs and for the very first time. And you could actually accelerate it with NVIDIA GPUs and RTX GPUs. And so the workstation market is really doing well. The backdrop of that of course is that people are building offices in their homes. And for many of the designers and creators around the world some 20 million of them they have to create, they have to build a workstation or an office at home, as well as the one that work, because we're now working with the new one.

And meanwhile, of course RTX, which we stopped all of our consumer graphics, the few hundred million installed base, PC gamers and to operate. And so there's a whole bunch of reasons. We're achieving record revenues what was supply constraints. We have enough supply to, I mean our second half company growth points. We want -- the next year we expect to be able to achieve our company's growth plans for next year. Meanwhile, we have and are securing pretty significant long-term supply commitments as we expand into all these different market initiatives that we've sort set ourselves (inaudible). And so I would expect it enables to a supply constrained environment for the vast majority of next year, as my guess at the moment. But a lot of that has to deal with (inaudible) demand is just. RTX is moving once in a generation of computer model, computer graphics, not the one just as happened is in the beginning of picture graphics. And so the convention is new pipeline working and need (inaudible)

Operator

Thank you. Next question comes from the line of Harlan Sur of J. P. Morgan. Your line is now open.

Q - Harlan Sur {BIO 6539622 <GO>}

Good afternoon, and congratulations on the strong results, I'll look at execution. The Mellanox networking franchise, this has been a really strong and synergistic addition to the NVIDIA Compute portfolio. I think kind of near-to mid-term, the team is benefiting from the transition to 200 gig and 400 gig networking connectivity in cloud and hyperscale. And then I think in addition to that, you guys are getting some good traction with the BlueField SmartNIC products. Can you just give us a sense on how the business is

trending year-over-year? And you expect continued quarter-over-quarter networking momentum into the second half of this year, especially as the cloud and hyperscalers are going to a server and CapEx spending cycle?

A - Jensen Huang

Yeah. I really appreciate that question. Now let's have a solid growth quarter, and the long lasting networking business is really growing globally. There are three dynamics happening all at the same time. The first is the transition that we're talking about. You know that the world data centers hyperscale data centers are use this forum of computing comp disaggregated, which basically just single application is running on multiple servers at the same time. This is what makes it possible for them to stabilize the more users for AI application or a service you just have to add more service. And so the ease of scale out that this aggregated computing provides also put enormous pressure on the networking. And at the Mellanox, the world's lowest latency and a high bandwidth and performance networking on plant. And so the ability to scale out, and the ability to provisioning disaggregated applications. It was really much, much better work on Mellanox networking. So that's number one.

Number two, almost every company in the world has to be high-performance computing company in that. You see that, that the cloud service providers one after another are building effectively supercomputers. What historically was InfiniBand and Supercomputing centers, the cloud service providers have to build supercomputers themselves and the reason for that is because of artificial intelligence in terms of these gigantic models. But the rate of growth of our network sizes, AI model sizes is doubling every two months. It doubling in our every year, every two years, it's doubling every two months. And so you can imagine the size. We're now talking about trimming AI models that are 100 trillion parameters launch. The human brain has 150-plus turning financials, and so -- for nuance. And so that gives you a sense of the scale of AI models that people is developing.

And so you will see supercomputers that are built out of Mellanox, InfiniBand and the high-speed networking along with NVIDIA GPU computing in more and more cloud service providers. You're also seeing in enterprises, for used in the discovery of DRIVE. There is a digital biology revolution going on, as the competition is stable. The large scale computing that we're going to do now and AI, better understand biology and better understand chemistry, and bringing both of those deals into the field of information sciences. And so you're seeing in March, the enterprises around the world as well. And so the second dynamic has to do with our (Technical Difficulty) InfiniBand networking that as well. The fact is one of them on high performance computing.

And the third dynamic is a (Technical Difficulty) data centers going sparkling. In order to orchestrate and run a data centers, we're just a few (Technical Difficulty) essentially when the entire data centers hundreds of thousands of servers as it is just one computer in front of you. That entire data center is software defined and the (Technical Difficulty) non-software that goes into the software defined data center run on today CPUs, is the network, is the storage that and now because of zero trust, the securities that. All of that is putting enormous pressure on the available computing capacity for applications, which is ultimately what data centers are designed to do.

And so for the software defined data center needs to have a place to Triton infrastructure software, and it's downloaded to offloaded to (inaudible) and very important to isolate it from the application plan. So that intruders can jump into the ability to offload, accelerate and isolate (Technical Difficulty) what they're supposed to run, which would be (Technical Difficulty) application. Just about every (Technical Difficulty) data center in the world is moving towards a zero trust and BlueField is just incredibly well positioned. So these three dynamics disaggregated computing, which means (Technical Difficulty) really strong with best networking with every (Technical Difficulty). And so these are (Technical Difficulty) the opportunity to tell you on that, how super exciting (Technical Difficulty) about the other prospects and the networking business and the employment for (Technical Difficulty).

Operator

Thank you. Next question comes from the line of Aaron Rakers of Wells Fargo. Your line is open.

Q - Aaron Rakers {BIO 6649630 <GO>}

Yeah. Comes around the data center in (Technical Difficulty). So maybe I'll just ask kind of on a P&L basis. One of the things that I see in the result (Technical Difficulty) more importantly the guidance. You're now collect guiding over 67% gross margin potentially. I'm curious as we move forward, how do you think about the incremental operating gross margin upside still from here? And how you're thinking about the operating margin leverage for the company from here through the P&L? Thank you.

A - Jensen Huang

I really appreciate the question at the highest level. The important thing to realize is that artificial intelligence, greatest technology force that the computer industry has ever seen. And potentially the (Technical Difficulty) the automation opportunities, which drives productivity, which translates and it opens up, it opens up opportunities for technology and computing company, like it never happened before. And let me just give you some examples. (Technical Difficulty) The fact that we can apply so much technology to warehouse logistics, retail automation, customer call center automation is really quite impressive. The fact that we could automate truck driving and last mile delivery providing a automated show further. Those can services and benefits and products are never imaginable before. And so the size of the IT industry if you will (Technical Difficulty) the industry that, that computer companies are themselves are part of has expanded tremendously.

And so the thing that we want to do is to invest as smartly, but as quickly as we can (Technical Difficulty) to go after the large operating -- large business opportunities, where we can make a real impact. And in doing so, while doing so, to do so in a way that is architecturally sensible. One of the thing (Technical Difficulty) make sure, which allows us to be so efficient, while doing, while addressing climate science on the one hand, digital biology on the other, artificial (Technical Difficulty) you talked about computer graphics and video. Using one architecture and having the ability and having the discipline now for almost 30 years, (Technical Difficulty) comes from, which is (Technical Difficulty)

architectural, our products are architectural in that way and the company's built architectural in that way. So, hopefully, as we go after these large market (Technical Difficulty) and we do so in a smart and disciplined way. We have great leverage through our architecture. We can continue to drive really great operating leverage for the company and for our shareholders.

Operator

The next question comes from the line of John Pitzer of Credit Suisse. Your line is open.

Q - John Pitzer {BIO 1541792 <GO>}

(Technical Difficulty) let me ask the question. I apologize for the short-term nature question, but it's what I get asked most frequently, I cannot now return to the impacted (Technical Difficulty) crypto with the potential impact of crypto. (Technical Difficulty) just measure any way to kind of (Technical Difficulty) the effectiveness of the low hash rate GeForce, why only 80% and not 100%? And how confident are you with CMP business being down as a reflection of crypto cooling off versus perhaps LHR not being that effective. And then I bring it up, because there's a lot of blogs out there that would suggest there as much as you guys are trying to limit the ability of miners to use GeForce, there are some work arounds?

A - Jensen Huang

Yeah, go ahead.

A - Colette Kress {BIO 18297352 <GO>}

Yeah, let me start there and answer a couple of the questions about our strategy that we've put in place in this last couple of quarters. As you recall, what we put in place was for both harsh records as well as putting industry and (Technical Difficulty). So, well (Technical Difficulty) articulated one of the metrics that we were looking as what percentage of those cards in Ampere, we were able to sell with lower hash cards. Almost all of our cards in Ampere are with hash rates, but also we are selling other type of cards. We're much higher than 80%. But just at the end (Technical Difficulty), we were approximately at 80%. So yes, that is moving up and we will continue as we move into Q3.

I'll move it to Jensen here to see if he can discuss further.

A - Jensen Huang

Yeah. I mean, there is -- there is the question about the strategy of how we're steering GeForce supply to gaming. We moved incredibly fast this time with CMP and with our LHR. And our entire strategy is about steering GeForce supplies to gamers. And we have every reason to believe that because of the drive and gaming, which is really a measure of gamers, the rate of growth of our team adoption of Ampere GPUs, there is some evidence that we are successful, but there are several reasons why it is different this time.

And the first one is, of course, the LHR, which is new and the speed at which we CMP to steer GeForce supply to gamers. Second is at the very beginning of the Ampere and RTX cycles. As I mentioned earlier, RTX is a complete reinvention of computer graphics. Every evidence is that, that gamers are incredibly -- game developers are incredibly excited about ray tracing. This form of computer rendering, graphics rendering is just dramatically more beautiful. And we're at the beginning of that cycle and only 20% has been upgraded so far. So, we have 80% to go in a market that is already quite large and installed base is quite large, but also grown. Last year, gamers grew 20% and just made (inaudible). The third reason is that our demand is strong in our channel of games. And you can see that every day with the shortage of supply as quickly as we're shipping it. It's (inaudible) all over the world.

And then lastly, we just had more growth drivers today because of RTX than ever. And we have the biggest wave of NVIDIA laptops. Laptops is our fastest-growing segment of computing and we have the largest wave of laptop coming. The demand for RTX in workstation, whereas previously, the workstation market was a slow growing market, it is now a fast-growing market and has achieved record. And after more than a decade of working on cloud graphics, our cloud graphics is in good demand. And so all of these segments are seeing high demand and we are (Technical Difficulty). So, I think the situation is a very different (Technical Difficulty)

Operator

Thank you. We have the next question comes from the line of Chris Caso of Raymond James. Your line is now open.

Q - Chris Caso {BIO 4815032 <GO>}

Yes. Thank you. Good evening. My question is about the split between the hyperscale and the vertical customers and the data center business, and the trends you're seeing in each. I think in your prepared remarks, you said both would be up in the October quarter. But I'm interested to see if you're seeing any different trends there, particularly in the vertical business as perhaps business conditions normalize and companies return to the office and they adjust their spending plans accordingly.

A - Colette Kress {BIO 18297352 <GO>}

Yeah. So let me start out with the question, and I'll let Jensen answer the tail. So far with our data center business, with our Q2 results, our vertical industries is still quite a strong percentage. Essentially, 50% of our data center business is going to our vertical industries. Our hyperscales make up the other portion of that, slightly below the 50%. And then we also have our supercomputing business with a very small percentage doing quite, quite well. As we move into Q3, as we discussed, we will see an acceleration of both our vertical industries and our hyperscalers as we move into Q3.

With that backdrop, we'll see if Jensen has additional commentary.

A - Jensen Huang

There's a fundamental difference in hyperscale, use of HPC or AI versus the industrial use of HPC in AI. In the world of hyperscalers and internet service providers, they're making recommendations on movies and songs and articles and search results and so on and so forth. And the difference in the improvement in accuracy that deep learning and artificial intelligence large recommender systems can provide us is really working for them.

In the world of industry, the reason why artificial intelligence is transformative, recognizing that most of the things I just mentioned earlier, it's not really dynamic in the world's largest industries, whether it's healthcare or logistics or transportation and retail, the vast majority of the reasons why in some of the physical sciences industries, whether it's energy or transportation as such or healthcare, it's the simulation of physics, the simulation of the world was not achievable using traditional first principle simulation approaches. But artificial intelligence or data-driven approaches has completely shaken that up and put it on its head.

And some examples, whether it's -- it's using artificial intelligence, so that you could feed up the simulation of the prediction of the protein structure of an -- or the 3D structural protein, which was recently achieved by a couple of very important networks, it's groundbreaking. And by understanding the protein structure, 3D structure, we understand it -- we can better understand its function and how it would adapt to other proteins and other chemicals. And it's a fundamental step of the process in drug discovery, and that has just taken a giant leap forward.

In the areas of clinical science, it is now possible to consider using data-driven approaches to create models that overcome this -- not overcome but accelerate and make it possible for us to simulate much, much larger simulations of multiphysics geometry-aware simulations, which is basically climate science. These are really important field of work that wouldn't have been possible for another decade, at least. And just as we made it possible using artificial intelligence, the realization of real-time ray tracing in every field of science, whether it's climate simulation, energy discovery, drug discovery, we're starting to see the industry recognizing that the fusion of the first-principle simulation and data-driven artificial intelligence approaches is going to get a giant leap up. And that is a second dynamic.

The other dynamic for industry is for the very first time, they could deploy AI model out to the edge to do a better job with agriculture, to do a better job with asset protection and warehouses, to do a better job with automating retail. AI is going to make it possible for all of these types of automation to finally be realized. And so the dynamics are all very different. That last one has to do with Edge AI, which was just made possible by putting AI right at the point of data and right at the point of action because you need to be low cost, you need to be high performance and instantly responsive. And you can't afford to stream all of the data to the cloud all the time. And so each one of them has a slightly difficult (Technical Difficulty)

Operator

Thank you. Your final question comes from the line of William Stein of Truist Securities. Your line is open.

Q - William Stein {BIO 15106707 <GO>}

Great. Thanks so much for taking my question. Jensen, I'm wondering if you can talk for a moment about Omniverse. This looks like a really cool technology, but I tend to get very few questions from investors about it. But it looks to me like this could be potentially very meaningful technology for you longer term. Can you explain perhaps what capabilities and what markets this is going after? It looks like perhaps this is going to position you very well in augmented and virtual reality, but maybe it's a sort of different market or group of markets, it's a bit confusing to us. So, if you could maybe help us understand it, it would really appreciated. Thank you.

A - Jensen Huang

I really appreciate the question, and it's one of the most important things we're doing. The Omniverse responses what is it? It's a similar investment that we (Technical Difficulty). And was made possible because of two fundamental technologies we invented. One of them is of course RTX, the ability to physically simulate light behavior in the world, which is beneficial. The second is the ability to compute or simulate the physics, simulate the artificial intelligence (Technical Difficulty) and objects inside the world. So we have the ability now to simulate physics in a realistic way, and it created an architecture that allows us to do in the cloud, distributed computed way, and to be able to scale it out to very much (Technical Difficulty).

And the question is, what would you do with such a frame? The simulator, it is a simulation in virtual world with portals, we call them connectors, portals are based on a industry standard, open standard that was pioneered by Pixar, and as we mentioned earlier that we're partnering with Pixar and Apple to make it even broadly adopted, with more broadly adopted it's called USD, Universal Scene Description. So basically portals of warm holes into virtual worlds. And this virtual world it was simulating -- to be simulating a -- it could be a concern for consumers. It could be, it's the key part for consumers. In the world of the industries we could use it for simulating robots, because robots (Technical Difficulty) robots inside these virtual worlds before they are downloaded from the stimulated tool real-world. (Technical Difficulty) to stimulate factors, which is one of the early works that, that we've done with IBM that we're going to shown at GTC, (Technical Difficulty) the future that it is done completely in Omniverse in the related in Omniverse, robots trend in Omniverse with goods and materials that are its original. CAD data put into the battery, the logistics plan like a ERP system, except this is a ERP system of physical goods and physical simulation -- stimulated through this Omniverse world and we could plan the entire factory in Omniverse.

This entire factory now becomes what is called visible tool. In fact, it could be a factory, it could be a stadium, it could be a airport, it could be an entire (Technical Difficulty) cost. These digital tools would allow us to simulate new algorithms, new AI, new and optimization algorithms. This tool we deployed into the physical world. And so what is Omniverse? What Omniverse is going to be an overlay, if you will. A virtual world increasingly people called metaverse. And we've now heard in several companies talk about the metaverse, the outcome from different perspectives, some of them from social perspective, some of them from (Technical Difficulty) perspective, some of them in our case from an industrial and design and engineering perspective. But the Omniverse is essentially an overlay of the internal and overlay of on the physical world (Technical

Difficulty) fuse all these different worlds together long-term. And you'll be able to get -- you mentioned the (Technical Difficulty) even built into the Omniverse world, so warm holed into the virtual world in the (Technical Difficulty). You could have an AI or object portal into our world using augmented reality season, when you have a (Technical Difficulty) it's only enjoyed in the virtual world and you can (Technical Difficulty) into your physical world within AI.

And (Technical Difficulty) fairly sure at this point Omniverse or the metaverse is going to be a new economy that is moduled in our point of time. And we'll have more enjoy a lot of our time in the future in Omniverse and in metaverse, and we will do a lot of our work there and we have a lot of robots, they're doing a lot of work on that we have. And (Technical Difficulty) themselves. And so Omniverse to us is an extension of our AI strategy, it's an extension of our high performance computing strategy on the mix of possible for companies and industries to be able to create digital twins that stimulate the physical version before (Technical Difficulty) before they deploy it and while they operate.

Operator

Thank you. I will now turn the call over back to Mr. Jensen Huang for closing remarks.

A - Jensen Huang

Thank you. We had an excellent quarter (Technical Difficulty) by surging demand for NVIDIA computing. Our premium work and a solid computing continues to invent graphics (Technical Difficulty) computing with AI. And then both by NVIDIA it's strongly computing, developers are creating the most impactful technology of our time. Our Natural language understanding and (Technical Difficulty) to autonomous vehicles in logistics centers to digital biology and (Technical Difficulty) science research, in metaverse world that obeys the lot of physics. This quarter we announced NVIDIA Base Command demand and Fleet Command to develop, deploy, sales and orchestrate if AI workloads that run on the NVIDIA AI enterprise software systems. With our new enterprise software, a wide range of NVIDIA-powered systems and global network of system and integration partners. We can exploit the world's largest industries have been raised to benefits from the transformative power of AI.

We are thrilled to have launched NVIDIA Omniverse, a simulation platform nearly five years in the making that runs physically realistic virtual world and commence to other digital platforms. We imagine engineers, designers and even autonomous machine connecting to Omniverse to create digital twin simulated worlds that help train robot, operate autonomous (Technical Difficulty) stimulate fleet from autonomous vehicle and even predict serious impacts on (Technical Difficulty). The future will have artificial intelligence augmenting our phone and then metaverse augumenting our physical world. They will be populated by real and AI visitors and open new opportunities for auditors, designers, scientists and the businesses. Our whole new digital economy for (Technical Difficulty). Omniverse is a platform for building the metaverse division. We're doing some part that's work and most impactful work in our history. And I want to thank all of the NVIDIA's employees for your remaining work and the exciting future we are inventing together. Thank you. See you next time.

Operator

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