BMO 2020 Virtual Technology Summit

Company Participants

- Ambrish Srivastava, MD of Semiconductor Research & Senior Research Analyst
- Colette Kress, Executive VP & CFO

Presentation

Ambrish Srivastava {BIO 4109276 <GO>}

Great. Thank you. Good morning, Colette. Good morning, and -- to BMO and for our listeners and viewers.

A real special thanks to Colette because as some of you may be aware, there's a lot of fires brewing in our part of the wood. Colette happens to be close to that as am I.

So thank you, Colette. I really appreciate it for you taking the time despite our minds are elsewhere as well.

So thank you for joining us.

Colette Kress {BIO 18297352 <GO>}

Absolutely.

Ambrish Srivastava {BIO 4109276 <GO>}

Thank you for joining us.

Questions And Answers

A - Ambrish Srivastava {BIO 4109276 <GO>}

Pleasure to talk about today. You just reported earnings last week, it was.

So maybe we can just start off with the near term real quick. What are you expecting for the business in the near term?

And what is visibility for the various segments?

If you could please start off with that?

Thank you.

A - Colette Kress {BIO 18297352 <GO>}

Yes.

So let me just start off for the group as a whole that says what has NVIDIA been doing lately, how do we want to think about the company now that it's post overall Mellanox.

So let me focus on a couple of pieces of that and then we can talk about what we're seeing in the future in terms of the near term.

So first, NVIDIA's overall computing adoption. Computing adoption is accelerating. Now this has many different pieces in that.

For example, our gaming has emerged as probably what we would refer to as a leading form of entertainment. And exactly where it's growing, it is growing worldwide. NVIDIA in terms of its RTX, which stands for its ray tracing, has taken the opportunity to redefine graphics during this period of time. And GeForce has continued to solidify as the world's number one gaming platform.

But that's one piece of our overall computing. If you move to the overall data center, we've taken the opportunity to launch our next architecture, the Ampere architecture, which starts with a new product cycle that's available for all of our platforms, but we first brought it to the overall data center.

It is the biggest generational base of any of our other architectures.

It has already started with strong A100, our first product. A100 demand is strong, but it is still in its early ramp. In less than a quarter and a half since its launched, it is still less than 1/4 of our most recent reported results for Q2 in the data center. The hyperscale adoption is going well and the ramp for the industry has not even started yet.

So we still have the future of continuing to ramp our A100 and the Ampere architecture.

It's our First Quarter of Mellanox. Mellanox closed at the beginning of Q2. That is allowing both the cloud scale out of AI services within the quarter, accelerating growth for the overall Mellanox platform.

It also is included in many of our products that we are bringing to market, both our A100 DGX or DGX SuperPOD or future EGX as well as our AGX overall product set.

So even during what we are dealing with here in California, remember, the worldwide is dealing to execute within the overall pandemic.

We did quite well during that, integrating overall Mellanox, overall launching the A100, bringing DGXs, producing our Selene DGX SuperPOD as well as a lot of different multiple software stacks that were also put to market.

So we delivered a strong quarter. And keep in mind, most all of our employees remain working at home.

But COVID did have some short-term negative impact to our professional visualization and auto business. In both of those cases, there are impacts to the overall economics due to any of the shutdowns.

We believe this is short term, and we hope for it to return in the quarters of the future.

But now your question was really about what do we see in the near term, what are we looking at in terms of the next quarter as we move forward.

So we provided guidance for the next quarter of $4.4 billion in total revenue. That's up 14% sequentially and up more than 45% year-on-year. Gaming is expected to grow, expected to grow about 25% sequentially into Q3.

Our data center is also expected to grow in the low to mid-single digits sequentially as well.

For data center, it would be approximately 150% year-on-year growth. In some cases, there are still economic impacts to our enterprises. Many of them are using the cloud. We'll continue to roll out the A100, but keep in mind that we are still seeing some of our enterprise and industries to be impacted by the overall COVID pandemic.

We do have good visibility into our hyperscale demand as we turn the corner into Q3, and the majority of our data center growth in Q3 is coming from NVIDIA compute versus the overall networking side.

Now looking at our automotive and professional visualization.

As we move into Q3, we expect it to be about similar levels to Q2.

So that's kind of a summary of what we're seeing or hope to see in the near-term future as we look at Q3.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Great. Thank you. I actually then wanted to focus on a few of the longer-term trends with the business segment.

So maybe we will start with gaming. You clearly had a very strong quarter, and the guide is -- that's a big guide, and we can see the benefits from the play from home, work from home.

So a couple of questions in there.

One, what is the sustainability of the growth that you're seeing?

And then also, Colette, the business has changed a lot. Laptop has become a pretty meaningful portion of the business.

So those of us who have been following you for a while, we tend to think of the old gaming business, which was mostly desktop.

Then Switch came along two, three years ago.

So question number one is, how do we think about the sustainability of the strength you're seeing?

And question number two, how should we think about the seasonality now that the mix is a lot different than what it used to be?

A - Colette Kress {BIO 18297352 <GO>}

Sure.

So let me remind everybody what we had in overall Q2. In Q2, we had broad-based demand across gaming. That's broad-based demand across all of the regions, all of the different products as well as all of the different channels.

So you are correct. There's multiple pieces in that, including our desktops, including our laptops and including our overall console work that we have as well.

Now Turing demand continues to be very strong. Turing architecture has been out for several years, but we still see a strong adoption, not only due to overall COVID, but really about the strength of bringing RTX to overall gaming RTX ability to do ray tracing. We're the only one in the market with a platform to enable real-time overall ray tracing.

Just speaking of our overall strong laptop growth that we've seen, this is continuing to provide a great price point to purchase laptops overall but also the ability to get ray tracing.

So for example, our ray tracing price points are now down to about $999, including a 2060. Additionally we've also taken the Turing in our overall laptops to low price points, such as $699 for an overall laptop with our GTX 1650.

So these things continue to fuel the overall laptop growth that we will think will be with us for quite some time.

Additionally you have seen the overall ecosystem support the overall gaming platform with the overall RTX and DLSS content that continues to grow.

So for right now, we have more than 30 RTX games that are announced and/or shipping, including some of the most famous ones such as Minecraft, Cyberpunk and Death Stranding.

So these are super important ecosystem poles that drive people to look for overall gaming solutions to play these exciting games that will incorporate overall ray tracing.

So Turing is still less than a third of our installed base at this time, and that is very common for this stage of the product life cycle.

It still has significant headroom for overall upgrades, and we feel very good about our momentum going into the second half of the year. Generally the second half of the year tends to be a little bit larger than our H1 of the year as people get ready for back to school but also in terms of the key holiday seasons that start early with the western holidays and move all the way to the Asia Pacific holidays at the beginning of next year as well.

So these are the things that we see In the long term, when we think about gaming, we believe we created through this environment of providing overall ray tracing on so many different platforms is a great overall entertainment medium for it to continue for some time.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Okay. Good.

I think one of the things you mentioned on the call was also that game developers because the consoles coming are also accelerating across platforms, which should help the business as well right?

A - Colette Kress {BIO 18297352 <GO>}

Correct.

So we continue in terms of working with all of our game developers as we think about the holiday season this year will be fueled by a lot of possible new consoles coming to the overall market. That's great for game development. Game development continues to spark the need for overall hardware.

We know that we've had two years or more in the making, working on overall ray tracing and working with much of this overall ecosystem to drive those games that

will be coming to market.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Okay. Awesome. I wanted to switch to data center.

It just seems -- if I step back and look at the longer term what's going on with the compute demand versus the unmet need, quite a few balls started rolling along the NVIDIA solution and not to mention the Mellanox acquisition. What jumped out at me was when you made the acquisition, I'm usually very skeptical when a deal is announced.

I think your business was around $300 million-odd or, so.

This quarter that you reported was -- the growth was just -- was eye-popping, for lack of a better word.

So a few questions on the data center to start off with. You addressed the visibility part earlier on the earnings call. You talked about how the certain verticals are not going where they are, are weaker. A100 is just starting to ramp.

So if we think about A100 and what it does for the business, I was surprised that it was 25% of the business already given it was just launched at the kitchen top TTC that Jensen conducted.

So where is the initial demand you're seeing?

Is it at the top of the stack where the virtualized GPU environment is being adopted by the hyperscalers?

Or is it something different?

So if you could touch on the initial uptake of A100.

A - Colette Kress {BIO 18297352 <GO>}

Sure.

So let me kind of frame in terms of what we saw in Q2 because you did give a great recognition there to our Mellanox acquisition and its overall results. In our Q2 data center growth rate, we had great growth, not only on the NVIDIA compute, but also the included -- the inclusion of overall Mellanox.

Our NVIDIA compute side within our Q2 continue to accelerate our growth versus the prior quarter.

Our Mellanox also reached overall record levels. Maybe it's something that over the long period of time that it took us to reach regulatory and close. Nobody was noticing the great overall work that Mellanox has opened in its product portfolio in terms of its work of establishing itself in many of the AI compute clusters that are now happening across the hyperscales and across the enterprises.

So we give great kudos to Mellanox and their work, and we're very excited about how well they did within the quarter as overall Q2.

They've now established the ability for us to take overall accelerated computing farther than just the overall compute side and absorb the ability to look at acceleration as we focus on the overall networking model. Keep in mind, our overall data center TAM is close to $50 billion even prior to overall Mellanox, and Mellanox could add another $20 billion in terms of overall TAM.

So when you look at our results in terms of Q2 data center, we have now moved to an annual run rate of more than $7 billion with the two of us now together.

Now what's interesting is the overall announcement of overall A100. We're stepping back a little bit. That's actually the announcement of the Ampere architecture with the first product being the overall A100. Now why is the A100 so important?

Why is Ampere so important?

So the key thing that we have been focusing on in the building of this overall architecture and the overall product is to address what we've seen in terms of our overall AI and data analytics, and a lot of that is focused on the model complexity. The model complexity over the last three years were essentially prior to launching overall V100, has probably grown 3,000x. A lot of the things that you are seeing and work on every single day, including deep recommendators or conversational AI or the natural language processing that is required, is strongly increasing this overall model of complexity. And so with the overall launching of A100, we provided a very unique architecture and product that allows the overall customer to not have to choose whether or not they needed a product or inferencing or trading. A100 can do both.

So that's very key in terms of what we're seeing in terms of the uplift, and now there's no limitations right off the bat in terms of the complexity of the models. The A100 given its tremendous improvement in performance versus the V100 allows them to take on any overall size of model.

We also continue in terms of expanding workloads that migrate to the cloud, and that's a key area of overall growth, particularly during this time as the cloud becomes very important for the enterprises and the overall hyperscales.

But also, we were able to unlock new workloads or new markets, particularly in the area of data science. You heard us discuss in terms of our work about the importance of the data science and importance of Apache Spark. Now Apache Spark is GPU accelerated.

So we've now expanded to the 500,000 overall data sciences that are out there as well as the 16,000 enterprises that use that with the ability to do data science using the overall GPU acceleration and speeding up a significant amount of their work.

So going back to the overall Ampere architecture and the A100. Yes. It's less than 25% of our overall data center revenue in Q2.

But keep in mind we're in the early stages of a ramp and a record fast ramp that we've already had.

So the cloud platform, such as Google's, had its fastest ramp in history of moving overall A100 to their cloud platform in about a month, and other cloud providers will be coming on soon. Azure also announced last week the announcement of the A100 instances also being available, and this can also scale to thousands of overall GPUs.

When we turn the corner into Q3 and Q4, we'll see 50-plus systems that will be available in many of our server manufacturers, such as Dell, HP and Lenovo and many of the others.

So that will be the path of allowing A100 to continue to reach our enterprises, enterprises outside of their overall cloud instances for what they can do in terms of on premise or on the edge.

So we feel really great in terms of how well the overall ramp has gone. We're very excited in terms of the work that the teams did to get A100 just launched given where we are in terms of the overall pandemic.

But the growth and the durability of this platform will continue to drive growth trends going forward.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Great.

One question on -- you mentioned Azure, the announcement. This is also incorporating Mellanox, right?

It will be.

A - Colette Kress {BIO 18297352 <GO>}

Yes.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Right.

So the question is, was this -- was it under development or that you're collaborating before the close and it's a combination of that?

Or it was a separate decision that Microsoft had made?

A - Colette Kress {BIO 18297352 <GO>}

Yes.

So if you worked through the overall Azure announcement, and they have logged quite a bit on their excitement of bringing this to market, it was, again a super record fast ramp for them there at Azure.

It allows them to scale from everything from one VM to eight A100 GPUs at one time, hundreds of VMs running but thousands of GPUs, but it also incorporates Mellanox-InfiniBand interconnect.

So this is a demonstration, yes, of NVIDIA and Mellanox working together. Even prior to this overall deal, we continue to look at the overall universe of areas where Mellanox customer set or Mellanox projects can also benefit from NVIDIA GPUs and/or vice versa, where NVIDIA GPUs incorporating overall Mellanox can also add value to the overall customer.

So this is an ability for Azure in this case to accelerate the full stack of hardware, software and networking together.

It's really a true test in terms of how data center architecture is really evolving, evolving to think about all of the different components together and think about the disaggregation of the compute that will overall occur.

Now our sale teams are working together in this case. This is a case that we were both working with Mellanox and both completed the work together.

But in the future, there is more opportunities for us to cross-sell together, but there's also a great opportunity in the road map alignment as we move forward. Right now, you see us with unique products coming to market. We've announced products together, where Mellanox is with inside many of NVIDIA's overall system that we are bringing together.

So more to happen in terms of that road map as we think in the future, but we're off to a great start already.

A - Ambrish Srivastava {BIO 4109276 <GO>}

You mentioned Apache Spark. 3.0 was just announced, I think, in June or July.

So what was the prior solution?

And what kind of TAM is it opening up for NVIDIA on the data science side?

A - Colette Kress {BIO 18297352 <GO>}

Yes.

So Spark is a really great platform. We're leading in terms of data analytics and its open source.

As we've discussed, more than 500,000 probably data scientists out there.

So a very important part of work that is not accelerated.

It's a rather inefficient process to be a data scientist. The process they do in terms of reworking their algorithms, reworking overall their abstraction of data is quite inefficient.

So we were excited to announce our work with overall Apache Spark, and now it is end-to-end GPU accelerator. Now what we mean by that is the GPUs can accelerate the entire platform from the ETL, which refers to the extract, the transform and the load or essentially the pre data processing part of it to the training and also to the inferencing.

So as a result, the overall queries that the data scientists put in used to take hours is something that can be done in terms of minutes.

So we're excited for the work in terms of work in the Spark and the outcome that came, and it's perfect for the A100 unified architecture to take advantage of it.

A - Ambrish Srivastava {BIO 4109276 <GO>}

One final question on data center for me. I know there's a bunch of questions on the line as well.

But as you mentioned, the run rate is now a $7 billion run rate, and parts of the business are in such nascent markets.

But is there a point that we're reaching a point where we should be thinking about some sort of seasonality for the business now that Mellanox is billion-dollar worth in there?

If you could just touch on that.

A - Colette Kress {BIO 18297352 <GO>}

We still continue to look at the data center as a project-by-project buildup. And now together with overall Mellanox, we've solidified that, that is still the case. Most of the work that both companies do is really project-by-project based of that building up.

So the seasonality just doesn't seem to be apparent at this time.

During some of these last several quarters, the overall project breadth and depth continues to build.

So we're excited that it continues to just show a build of projects rather than any overall seasonality.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Okay.

So it sounds like in the -- at least in the near to medium term, this should not also have characteristics of a very lumpy business given what you just explained as there's projects that you see in the pipeline that are about to ramp.

Okay. That's helpful.

A - Colette Kress {BIO 18297352 <GO>}

Right.

So we did -- we gave overall guidance for overall Q3 as we looked outward in terms of what we're expecting in the data center business. That was based on what we had, was fairly good visibility into our overall Q3. Now keep in mind, as we move forward, we'll continue to provide, but we generally just provide guidance one quarter up.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Right. Staying with the long term, this one really jumped out for me at least was the Mercedes announcement on the automotive side.

So it sounds like this -- I mean this, longer term, could potentially be really transformative for the business as it relates to recurring revenues.

So can you talk about, A, how are you thinking about it?

And what kind of timing?

And then second, more nearer term, when do we get the headwinds from the infotainment behind us when we start to see some of the work you've been doing with the automotive guys on the AI side or the ADAS side start to kick in?

A - Colette Kress {BIO 18297352 <GO>}

Yes.

So sure, let me start first with the legacy infotainment revenue. Currently, right now, that is approximately half of the business, a little less than that in terms of Q2. This is an area of legacy infotainment, which has not been an overall longer strategic focus for us. These are long design wins, and we'll continue to provide that.

But our overall strategic priorities reside in terms of AV and AI overall cockpit as we go forward, and what we have seen in some of the challenges in the last Q2 has really been also affected by the overall pandemic and the shutdowns of overall manufacturing and the overall purchasing.

So we'll probably see that return as we're starting to see the automotive manufacturing start to pick up.

But keep in mind, this infotainment business was not necessarily a planned overall growth as we move forward.

But let's kind of turn to where we are focused and the importance of the overall Mercedes-Benz announcement that we did.

It is really a great example of overall Mercedes working with NVIDIA in terms of developing not only the overall hardware but the full overall technology stack that will be in the cars and their overall entire fleet to deal with overall AI and AV as they move forward. The vehicles are and will continue to be software-defined in the future and upgradable, likely over the air, over the life of that overall vehicle. This gives us both an opportunity of these upgrades to be in the thousands of dollars per vehicle across millions of overall vehicles.

We plan in this very transformational deal with Mercedes to share in these overall revenues between the two companies.

But we believe the opportunity is quite large, and we believe the margins are quite rich as well. This is a case where we will see overall production likely in the calendar in 2024, where we'll see these overall -- head to overall market.

So we're excited in terms of this very important transformation deal. I think it will continue to lead others that are really focusing on how to streamline and think about building these very complex overall AV solutions going forward.

A - Ambrish Srivastava {BIO 4109276 <GO>}

I had a question on capital allocation. Given the current uncertainties around COVID, it's understandable that you're being more conservative in paying off the debt, which was raised to close Mellanox, and you have paused share buyback. Could you just talk about the longer-term capital allocation thinking?

A - Colette Kress {BIO 18297352 <GO>}

Sure. That's correct.

We just completed the acquisition of Mellanox for $7 billion of cash. Currently, right now, we have about $11 billion of cash on the books.

But keep in mind, we also have about $7 billion of overall debt currently on the books.

We have a capital allocation to be focused on our dividends, continuing our dividend program, our overall buybacks and overall ongoing review of M&A opportunities. Those are our three key areas that we focus in terms of that capital allocation.

But in this case, our buybacks will probably depend mostly on the overall marketing -- market conditions that may be out there. We'll consistently evaluate from time to time when to overall repurchase our stock.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Great. At this point, I'm going to pause and poll for questions again. (Operator Instructions) Let me just -- okay.

So the first one from the line, Colette, is how is the relationship between NVIDIA and TSMC?

And how should we be thinking about this relationship going forward?

A - Colette Kress {BIO 18297352 <GO>}

Yes. A super important relationship, a relationship with TSMC, has been a partner with them for more than 20 years. That relationship has been built not only on understanding our process but also us understanding TSMC's process.

But keep in mind, we are dual fab providers.

We work with TSMC, we work with others. That is an important piece for us as we think about the overall enterprise risk of only having one, and we've been for several years are working across both overall fab providers.

But that relationship and bringing overall 7-nanometer for Ampere, we couldn't be more pleased with the work together with TSMC.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Okay. The second question is how should we think about the impact of the extra week in the January quarter as it relates to revenue and/or OpEx?

A - Colette Kress {BIO 18297352 <GO>}

Yes.

So this is correct. This year, we have an extra week.

We have 53 weeks within our fiscal year. That extra week will hit our Q4.

Our Q4, we had provided overall guidance on OpEx from a non-GAAP basis and a GAAP basis in terms of those operating expenses.

We gave it last quarter, and we confirmed it again with our overall Q3 guidance for the full year. That extra week is incorporated within that guidance. Key things such as the overall headcount costs, the compensation, the benefits as well as an extra week of overall depreciation for many of our assets as well as leases would be things to incorporate within that Q4 extra week.

Now from a revenue standpoint, as we've discussed in terms of our data center, we are more project-based. Most of our data center business is project-based. And essentially our gamers are a gamer space in terms of how many gamers we overall have.

So we don't expect anything to really change our overall revenue profile with that (inaudible).

A - Ambrish Srivastava {BIO 4109276 <GO>}

Hmm.

It just keep going. That sound seems to stop.

Okay. I hope that answers the gentleman's question. I wanted to touch upon and something -- actually it was a good question that was asked on the earnings call, and Jensen addressed it, is the importance of process technology.

The seven nanometer, the Ampere chip was really if I put on my engineering hat, wow. That's so many transistors back in there.

So what is the right way to think about with the Moore's law slowing down?

What is the way to think about the importance of process technology to the NVIDIA solution?

Clearly, it is.

But the -- when I think about TSMC and there's -- TSMC is committed to making a manufacturing location here in the U.S.

But it is one company that has so much of the foundry capacity for the industry.

I know Samsung is a second source for you, Colette.

But as a CFO, as a business leader, it should -- given all the few concerns that are out there, it should be a possible concern that one company controls so much of the manufacturing.

So how do you balance that -- having that as a -- not a concern but a potential threat, geo threat, which we can't predict, of course?

But how do you manage that when you think about your outsourcing?

A - Colette Kress {BIO 18297352 <GO>}

Yes.

So I think we have to step back and understand a lot of the work that we do even before we bring a new architecture to market.

For many years, as you know, we will have multiple architectures in the hopper working to bring to overall market. In each of those scenarios, we look at that architecture across both of our overall fab providers for them to both tape it out and/or bring it to production. That allows us to continue with both of the fabs but also continue with both of the fabs in each different type of node.

We will continue to test which node we should along go with our overall architectures. This allows us the most flexibility as well as the most understanding of the overall process techniques about what would be beneficial to both our customers and the workloads that we're bringing to market.

So being dual, being dual in terms of multiple different nodes as well as testing out at each of those overall fabs, I think, has given us the most flexibility as we move forward. We're very pleased with the work that's done across there as work with our overall Samsung leaders as well as our TSMC leaders.

It's really about those relationships.

It's really about understanding their processes that allows us to go market and be so successful more than it is about the actual machines or the work that has even done afterwards in terms of building those products.

So we continue to believe that these relationships are very strong. We're pleased with both overall partners, and I think we have a great balance across those fabs (inaudible).

A - Ambrish Srivastava {BIO 4109276 <GO>}

Sorry. My question is coming back to capital allocation and M&A. What are you looking at when you think about M&A?

Mellanox seems like it really helped you solidify your position in the data center on the connectivity side and also got your Ethernet.

So what are the criteria that you have?

And what areas are you looking to bolster the compute or network?

A - Colette Kress {BIO 18297352 <GO>}

Yes.

So I think -- and if you look at our portfolio that we have, we have quite a diversified portfolio across gaming, across overall enterprise graphics, whether that be virtual reality, AR or just things that they do in terms of the overall design project.

Then you have data center, which we are now taking on the overall as a whole within the data center, including the GPU, including overall networking as well as a lot of our work in terms of our storage as well.

Overall, automotive has been a great, unique opportunity for the overall edge to bring such (inaudible).

So as we look forward and we think about overall M&A opportunities, there is a lot of different opportunities, and many of them both come to us and other things that we tend to review.

We like to review for really great strategic teams that can be a part of the company.

But other than that, it's tough for us to really signal any specific areas. There's a lot of things that are both interesting out there, but we're also extremely thoughtful of looking at M&A.

As you know, we haven't been the largest M&A to reach this stage where we are as a company.

We will use it if we believe it will really drive an important strategic change for us as a company.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Yes.

It makes sense. I'm going to toggle back to the line here. A couple of questions, Colette. Number one, the expected time line to autonomous vehicles continues to fluctuate back and forth. That's probably -- it's clearly not a reflection on what you have said as what the market is doing. What does NVIDIA do on the time line to launching AV robotaxi service?

And what are the key current functional technology bottlenecks?

A - Colette Kress {BIO 18297352 <GO>}

Yes.

So the path to overall AV, I think many of the overall manufacturers over the last couple of years have really understood both the complexity of the overall driving experience, the amount of compute that will be necessary, and therefore, the significant amount of software widing that would happen between now and the time of the cars being on the road.

They also use this opportunity to bifurcate into two different paths, one where it would be robotaxis, robotaxis that would be in a confined overall area of maybe a block mile in order to do that or what they could provide in overall passenger cars that would continue to improve over a period of time, starting with something as a Level 2 AV offering going to Level 2+ and then over the time period of the car being built.

So a lot of better understanding from the manufacturers about what they have been working on and the challenges of bringing us. Their number one concern, our number one concern is always going to be safety, and that safety assurance is a top priority for all of the companies to focus on AV.

Now as we move forward, there is a possibility for both of those strains to actually hit the market at the same time.

It has been moved out a couple of years as it's really taking them more time to define, test and really improve that overall platform for it to be in production overall cars.

So we're moving out a couple of years from now to where you'll probably see the first production pieces on the road, but that can be both for robotaxis as well as passengers.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Okay. Thank you. There's another one, again on the ADAS side. The question is, on the ADAS side, you are collaborating with many companies across the spectrum from pure hardware to full-blown ADAS solutions.

So how does some of your customers feel when you're both a supplier and a potential competitor?

A - Colette Kress {BIO 18297352 <GO>}

When we think about the opportunity of overall ADAS, if we look at the opportunity of providing them an AV solution, this is a synergistic approach to how the manufacturers may be building out. If we can define that overall compute the long term and they can use the same type of hardware to do the overall ADAS, that's a win-win for the end solution of the manufacturers as well as the customer, that they have that consistent platform.

So it has been well received as an opportunity as we go forward.

It's not our area of concentration on ADAS, but we can always swing and pick that up as we move to these overall hiring platforms going forward.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Great. Before we wrap up, Colette, first of all, I'm going to say thank you, again. Good luck. Both of us need it on that front. If you have any closing remarks that you would want to leave us with, that would be great.

A - Colette Kress {BIO 18297352 <GO>}

Sure.

So I thank you for this opportunity.

It's one of our first abilities to come out after earnings, so I love the fact that the virtual experience is working well.

But one of the things to keep in mind that NVIDIA's overall breadth and depth of its overall portfolio and its ability to accelerate compute overall, compute as it remains not only to the data center and not only to the GPU, but really focusing on compute, networking, but all the other types of compute opportunities with overall gaming and overall gaming in terms of -- from a work from home, work from home, play from home.

It served us well.

It's gotten us to focus us on more and more as an entertainment medium during this period that we are.

We believe that will take us through the second half of the year as well.

So I thank you for your interest in NVIDIA and hosting this call.

A - Ambrish Srivastava {BIO 4109276 <GO>}

Thank you, again. Thanks, Simona. Thanks, Stewart. Take care.

Guys, we'll be back in about 15 minutes. Thank you.

A - Colette Kress {BIO 18297352 <GO>}

Bye-bye.