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Q2 2021 Earnings Call

Company Participants

- Devinder Kumar, Executive Vice President, Chief Financial Officer and Treasurer
- Laura Graves, Corporate Vice President, Investor Relations
- Lisa Su, President and Chief Executive Officer

Other Participants

- Aaron Raikers
- Blayne Curtis
- Harlan Sur
- Joe Moore
- John Pitzer
- Mark Lipacis
- Matt Ramsay
- Stacy Rasgon
- Toshiya Hari
- Vivek Arya

Presentation

Operator

Hello, and welcome to the AMD's second-quarter 2021 earnings conference call. At this time, all participants are in a listen-only mode. (Operator Instructions) A question-and-answer session will follow the formal presentation. As a reminder, this conference is being recorded. It's now my pleasure to turn the call over to Laura Graves, Corporate Vice President, Investor Relations. Laura, please go ahead.

Laura Graves {BIO 15126067 <GO>}

Thank you, and welcome to AMD's second-quarter 2021 financial results conference calls. By now, we hope you have had the opportunity to review a copy of our earnings press release and slides. If you have not reviewed these documents yet, they can be found on the 'Investor Relations' page of amd.com.

Participants on today's conference call are Dr.Lisa Su, our President and Chief Executive Officer; and Devinder Kumar, our Executive Vice President, Chief Financial Officer, and Treasurer. This is a live call and will be replayed via webcast on our website.

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Before we begin, I would like to note that Saeid Moshkelani, Senior Vice President and General Manager of our client business, and Ruth Cotter, Senior Vice President of Worldwide Marketing, Human Resources, Investor Relations, and Strategy, will attend the Jefferies Semiconductor and Hardware Summit on Tuesday, August 31. Devinder Kumar will attend the Deutsche Bank Technology Conference on Friday, September 10. And our third-quarter 2021 quiet time is expected to begin at the close of business on Friday, September 10.

Today's discussion contains forward-looking statements, based on current beliefs, assumptions, and expectations, speak only as of today, and, as such, involve risks and uncertainties that could cause actual results to differ materially from our current expectations. We refer to the cautionary statement in our press release for more information on factors that could cause actual results to differ.

We will refer primarily to non-GAAP financial measures during this call. The full non-GAAP-to-GAAP reconciliations are available in today's press release and slides posted on our website.

With that, I will hand the call over to Lisa. Lisa?

Lisa Su {BIO 5791223 <GO>}

Thank you, Laura, and good afternoon to all those listening in today. Our business performed exceptionally well in the second quarter. A strong execution and growing customer preference for our high-performance products generated significant market and financial momentum. We saw a very strong demand across all of our businesses, which resulted in second-quarter revenue growing 99% year-over-year to $3.85 billion.

We expanded our gross margins by 4 percentage points, doubled operating margin, and more than tripled profitability year-over-year. We also delivered record revenue for the fourth straight quarter and generated record free cash flow in the quarter.

Turning to our computing and graphics segment, second-quarter revenue increased 65% year-over-year to $2.25 billion, driven by significant growth in both Ryzen and Radeon processor sales.

In client computing, we had another record quarter of processor revenue. Both desktop and notebook revenue increased by a strong double-digit percentage year-over-year, and we believe we gained revenue share for the fifth straight quarter.

In desktop, robust demand for our highest end Ryzen processors drove a richer mix in the quarter as Ryzen 9 processor unit shipments more than doubled year-over-year. In notebooks, unit shipments and ASP increased sequentially and year-over-year. We delivered our seventh straight quarter of record mobile CPU revenue, led by the steep ramp of our latest generation Ryzen 5000 mobile processors.

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In the Enterprise, Ryzen Pro mobile processor unit shipments nearly doubled year-over-year as we won multiple high-volume deployments in the quarter with Fortune 500 financial services, automotive, and pharmaceutical companies.

In graphics, revenue doubled year-over-year, led by demand for Radeon 6000 series desktop graphics cards in the channel and adoption of our data center GPUs. RDNA 2 GPU shipments grew by a double-digit percentage sequentially as the first notebooks powered by our Radeon RX 6000M series GPUs launched, including the first AMD Advantage notebooks that combine high performance Ryzen CPUs, Radeon GPUs, and AMD software with premium design features to deliver best-in-class gaming experiences.

ASUS, HP, MSI, and Lenovo announced plans to bring AMD Advantage notebooks to market over the coming months as we further expand our presence in the gaming notebook market.

Data center graphics revenue more than doubled year-over-year, driven by new deployments of our AMD Instinct accelerators, including initial shipments of our next-generation data center GPUs featuring our CDNA2 architecture.

CDNA2 represents a major step forward in our multi-year data center GPU strategy, delivering more than twice the performance of our current generation and significantly higher performance competitive offerings in HPC workloads.

We expect data center GPU revenue to grow in the second half of the year as we ramp production of our next-generation AMD Instinct accelerators and open-source ROCm software to support multiple leading-edge supercomputer wins, including Frontier, LUMI, and Pawsey.

Turning to our enterprise, embedded, and semi-custom segment, revenue increased 183% year-over-year to $1.6 billion, driven by strong growth in both semi-custom and EPYC processor sales. Semi-custom revenue grew sequentially and year-over-year, and we expect game console demand to remain strong throughout the year. We announced a new semi-custom win earlier this month as Valve chose AMD to power their Steam Deck handheld game console, planned to launch this December.

In embedded, we are making good progress expanding our presence across key verticals, including automotive, networking, and storage. We ramped production shipments in the quarter of AMD Ryzen embedded CPUs and Radeon RDNA 2 GPUs to power the in-dash infotainment systems in Tesla's latest Model S and Model X vehicles.

Now, turning to server. We delivered our fifth straight quarter of record server processor revenue. Sales grew by a significant double-digit percentage sequentially, driven by higher unit shipments and ASP. We are seeing very strong demand across our full server portfolio with second-generation EPYC processor revenue growing sequentially and third-generation EPYC processor sales more than doubling quarter-over-quarter.

Third-generation EPYC processor revenue is ramping faster than the prior generation as customers and multiple third-party reviewers recognize the absolute performance and price performance leadership of our latest server processors.

Cloud demand further accelerated in the quarter, led by growing internal workload adoption and nearly 50 new AMD-powered instances by AWS, Microsoft Azure, Google, Tencent, and Alibaba.

Google announced to chose AMD EPYC processors to exclusively power the first offering in its new Tau VM family that delivers industry-leading performance and value for scale-out workloads versus other competitive x86 and ARM offerings.

In enterprise, we see demand accelerating as more than 100 third-generation EPYC processor platforms are now in production from Dell[ph], HPE, Lenovo, Supermicro, Cisco, and others.

In addition, we are seeing a rapid expansion in the number of AMD-powered solutions in appliances from our OEM and ecosystem partners, targeting hyperconverged and virtual desktop infrastructures[ph] as well as workloads demanding the highest per-core performance, such as EDA and computational fluid dynamics.

We secured multiple HPC wins in the quarter, including newly announced deployments by the National Supercomputing Centre, in Singapore, and the French Atomic Energy Commission. Our substantial momentum HPC was highlighted by the fact that the number of AMD-based systems on the latest Top500 list of the world's fastest supercomputers increased by almost 5x in the last year and that EPYC processors power half of the 58 newly listed systems.

Looking at our overall data center business, revenue nearly doubled year-over-year and increased sequentially from a high teens percentage of overall revenue in the first quarter to greater than 20% in the second quarter.

We expect data center revenue to continue growing faster than overall revenue, based on the strength of our EPYC processors and Instinct accelerators and the significantly expanded engagements we have built with the leading OEMs and largest MDCs.

Turning to our Xilinx acquisition, we passed additional milestones in the quarter and received unconditional regulatory approvals in multiple jurisdictions, including in the EU and the United Kingdom. We remain on track to close the strategic transaction by the end of the year and are excited about the opportunities ahead.

In closing, I'm extremely pleased with our execution as our business accelerated considerably in the first half of the year. Based on growing customer preference for our products and strong supply chain execution, we now expect annual revenue to grow by approximately 60% year-over-year, up from approximately 37% growth we guided at the beginning of the year.

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Our engineering teams are aggressively driving our product and technology roadmaps to continue setting the pace of innovation for high-performance computing. We remain on track to launch next-generation products in 2022, including our Zen 4 processors built with industry-leading five-nanometer process technology and our RDNA 3 GPUs.

We also recently demonstrated the next major advance in our triplet strategy, with our differentiated 3D die stacking technology that enables significantly denser and more efficient connections between stack chips.

Based on the strength of our long-term roadmap and the deep partnerships we have established, we expect to continue growing significantly faster than the market. In summary, we're making great progress towards our vicious goal of establishing AMD as a high-performance computing leader and a best-in-class growth franchise.

Now, I'd like to turn the call over to Devinder to provide some additional color on our second-quarter financial performance. Devinder?

Devinder Kumar {BIO 17763436 <GO>}

Thank you, Lisa, and good afternoon, everyone.

AMD had another outstanding quarter. Our high-performance computing product momentum is driving record revenue growth, record profitability, and significant cash generation.

Second quarter revenue was $3.85 billion, up 99% from a year ago and up 12% from the prior quarter. Year-over-year growth was driven by significant revenue increases across all businesses.

Gross margin was 48%, up 360 basis points from a year ago, driven by an improved revenue mix and higher margin contribution from all businesses.

Operating expenses were $909 million compared to $617 million a year ago as we continue to invest in business growth in our long-term product roadmaps. Operating income was $924 million, up $691 million from a year ago, driven primarily by revenue growth.

Operating margin doubled to 24%, up from 12% a year ago. Net income more than tripled to $778 million, up $562 million from a year ago. Diluted earnings per share was $0.63 per share, compared to $0.18 per share a year ago. This includes a 15% effective tax rate in the second quarter of 2021 compared to 3% a year ago.

Now, turning to the business segment results. Computing and graphics segment revenue was $2.3 billion, up 65% year-over-year, driven primarily by significantly higher client and graphic processor revenue with a richer product mix in both businesses.

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Computing and graphics segment operating income was $526 million or 23% of revenue compared to $200 million or 15% a year ago. Enterprise, embedded, and semi-custom segment revenue was 1.6 billion, up 183% from $565 million in the prior year. The strong revenue increase was driven by higher semi-custom product revenue and EPYC processor sales.

EESC segment operating income was $398 million or 25% of revenue compared to $33 million or 6% a year ago.

Turning to the balance sheet. Cash, cash equivalents, and short-term investments were $3.8 billion, up from $3.1 billion at the end of the prior quarter. Free cash flow was a record $888 million, compared to $152 million in the same quarter last year. Free cash flow for the first half of 2021 of $1.7 billion was more than double 2020 annual free cash flow.

With our strong financial results and growing cash generation, we announced the $4-billion stock repurchase program in May, under which we repurchased 3.2 million shares of common stock for $256 million in the second quarter. Inventory was $1.8 billion, up from the prior quarter in support of higher revenue expected in the second half of the year.

Let me now turn to the third-quarter outlook. Today's outlook is based on current expectations and contemplates the current global supply environment and customer demand signals. We expect revenue to be approximately $4.1 billion, plus or minus $100 million, an increase of approximately 46% year-over-year and approximately 6% sequentially.

The year-over-year increase is expected to be driven by growth across all businesses. The sequential increase is expected to be primarily driven by growth in our data center and gaming businesses.

In addition, for Q3 2021, we expect non-GAAP gross margin to be approximately 48%; non-GAAP operating expenses to be approximately $1 billion; non-GAAP interest expense, taxes, and other to be approximately $150 million; and the diluted share count to be approximately 1.23 billion shares.

For the full-year 2021, we now expect revenue growth of approximately 60% over 2020, up from our prior guidance of approximately 50%, driven by growth across all businesses. We also expect non-GAAP gross margin to be approximately 48%, up from prior guidance of approximately 47%; non-GAAP operating expenses to be approximately 25% of revenue, down from previous guidance of approximately 26% of revenue; non-GAAP effective tax rate to be 15%; and we expect the company's cash tax rate to be approximately 2%.

In closing, we delivered another excellent quarter with very strong year-over-year growth, accelerated our business momentum, and delivered exceptional financial returns.

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I'll turn it back to Laura for the question-and-answer session. Laura?

Laura Graves {BIO 15126067 <GO>}

Thank you, Devinder. Operator, we're ready to begin the Q&A session now.

Questions And Answers

Operator

(Question And Answer)

Thank you. We'll now be conducting a question-and-answer session. (Operator Instructions) Our first question today is coming from Toshiya Hari from Goldman Sachs. Your line is now live.

Q - Toshiya Hari {BIO 6770302 <GO>}

Good afternoon. Thank you so much for taking my questions and congratulations on a very strong set of results. Lisa, you didn't really touch on the supply situation in the marketplace today that appears to be a pretty big focus for companies and also for investors. How would you characterize the current gap between supply and demand?

And importantly, as we look ahead to 2022, how comfortable are you from a foundry wafer capacity and ABS substrate capacity perspective as you continue to grow the business strong double digits? And then I've got a quick follow-up.

A - Lisa Su {BIO 5791223 <GO>}

Sure. Well, hi, thanks for the question. I think it's fair to say that the semiconductor demand environment and particularly the AMD demand environment has been very strong in 2021. We've been working on supply for the past couple of quarters. I think I'm actually quite pleased with the progress that we've made in terms of increasing our supply. And what I've said previously is, certainly, we do see some level of constraints, but we are making progress each quarter and we made progress in the second quarter that enabled us to exceed the original guidance.

And as we go into the second half of the year, we're continuing to bring on extra supply each quarter, which is leading to the full-year guidance raise that we have. So, I think overall, we continue to make progress. I will say that it's tight, like you've heard from many other companies through the end of this year. I think it improves in 2022. We've been planning for significant growth. Our model is one where we're going to drive significant growth. So, we've been planning with that with our supply chain partners. And we do have confidence that we can continue to grow substantially as we go into the second half of this year and into 2022 with the supply chain.

Q - Toshiya Hari {BIO 6770302 <GO>}

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Great. And then as a quick follow-up, I guess a multipart question on your server CPU business or data center business more broadly. I was hoping you could speak to sort of the revenue construct in the second quarter. And if you can differentiate between a second gen and third gen Rome versus Milan and then what you're seeing on the cloud side versus enterprise side of your business and the outlook into the second half as you think about sort of the different segments of that business?

And then finally, you talked about data center being more than 20% of revenue in Q2. What's embedded in your second half guidance? Thank you.

A - Lisa Su {BIO 5791223 <GO>}

Sure. Okay. Quite a few questions there. So let me try to work through them. So, in terms of the makeup of our data center business, I mean, our server business was very strong. I think the product capability and sort of just sort of the performance and the total cost of ownership for Milan has proven out very well with our customers. So, we're very happy with that launch.

In the second quarter, we did see significant growth with Milan. That being the case, Rome was still a larger portion of the revenue. And I would say in the second quarter, it was more cloud-weighted. So, we saw cloud tends to ramp faster on new generation, and that was the case in the second quarter. So, cloud grew faster than enterprise.

As we go into the second half of the year, we expect that Milan will ramp very quickly and crossover -- third general crossover second generation in the third quarter. And what we're seeing actually is continued strength across cloud and HPC, which have been traditionally strong for AMD. But we're actually seeing very good momentum in enterprise. And I think with the breadth of the platforms that we have out there and just the coverage and then sort of the per core performance as well as the overall socket level performance, we're getting a very strong traction, and we're pleased to see that. So I think as we go into the second half of the year, I think enterprise will be a stronger component for us than it was in the first half of the year, and that's the balance that we want. But overall, we're pleased with that.

And then in terms of -- your question about server was -- I'm sorry, data center was greater than 20% of our revenue in the second quarter. We believe that the data center business will continue to be a strong driver for us into the second half of the year. And so, it will be a larger percentage of our overall revenue in the second half of the year.

Operator

Thank you. Our next question is coming from Aaron Raikers from Wells Fargo. Your line is now live.

Q - Aaron Raikers

Yes. Thanks. Thanks for taking the question, and congratulations as well on the quarter. I wanted to ask about kind of the trajectory of gross margin. If we take the full year

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guidance now guiding up 100 basis points with the 3Q guide into consideration, it looks like you're actually pushing towards a 50% gross margin. How do we think -- maybe you can unpack how we should think about the segment gross margin levels. And do you think that that -- if we're hitting 50%, that's a new threshold that we can consider modeling going forward?

A - Devinder Kumar {BIO 17763436 <GO>}

I think on the gross margin, first of all, I'll say, we're very pleased with the progress we have made. And as you observed, we have taken up the guidance for the year from 47% to 48%. And our long-term target model, we have plans to get to greater than 50%. And I think with the strength of the businesses that Lisa just talked about, especially in the data center, help us get there.

The product mix is important. The ramp in the data center and the client PC business as we gain revenue share is going to be important to drive that. And we are confident that we can continue to improve the gross margin given the mix of the business and also the revenue ramp in the businesses that are higher than corporate average gross margin. So, I feel very good about getting to the greater than 50% over time.

A - Lisa Su {BIO 5791223 <GO>}

Yes. And maybe --

Q - Aaron Raikers

I'm sorry.

A - Lisa Su {BIO 5791223 <GO>}

Aaron, I was just going to add to that. I think the most important thing to think about as you think about our business going forward is, it really is about the mix of business. So, as data center becomes a higher percentage of our business, that's a favorable mix for us. And then within the segments as well, as we look at where we're strategically focusing as we really mix to the higher end of the portfolio, those are the key things that we're looking at from a margin standpoint. But there are always puts and takes in the business. It's just really about the mix.

Q - Aaron Raikers

Yes. And then just as a real quick follow-up, as Milan ramps and appreciating at Rome, it sounds like still the majority of the Epyc lineup, how successful have you been as far as leveraging a stronger position with regard to uplift on blended ASPs as we think about the continuation of Milan and even starting to think about Genoa going forward? Thank you.

A - Lisa Su {BIO 5791223 <GO>}

Yes. So, as we think about sort of the trajectory of the business, it is about offering more performance per socket and that is what we're doing. So, I think Milan is certainly a

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performance uplift relative to Rome. It does lend itself to a higher ASP or a higher mix of the business. And then clearly, as we go to Genoa, we're going to continue that trajectory. So, I think -- and then within server, there's also a mix between cloud and enterprise. As I said earlier, we're quite cloud weighted here in the first half of the year. And as we go to a stronger percentage of enterprise, that would also be a favorable mix in the service side of the business.

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Operator

Thank you. Our next question is coming from Vivek Arya from Bank of America Securities. Your line is now live.

Q - Vivek Arya {BIO 6781604 <GO>}

Thanks for taking my question. Lisa, it's to continue on the server business. Until last year, we saw AMD take about 2 to 3 points of server share annually. This year, the share gains seem to be accelerating on the order of 4 to 5 points. I'm curious what's driving this acceleration. And did you see anything from Intel's roadmap disclosures yesterday that you think can impact your server share gain momentum?

A - Lisa Su {BIO 5791223 <GO>}

Yes, Vivek, thanks for the question. Well, as you know very well, we're very focused on sort of multi-quarter, multiyear progress in the server and the data center business. I think we're excited with the momentum around our server business. I think the product roadmap is very strong. I think the execution has been very strong. I think customers also with the third generation in Milan, felt much more comfortable to go more broadly with Milan just because this was sort of the third time, right.

They had -- many of our customers were on Rome already. But with Milan, it was sort of socket compatible. And so there was -- it was a faster time to ramp, and we're seeing it ramp faster. So, we feel good about where we're positioned. I mean, it's a very competitive market out there, Vivek. I'll always say that. We expect our competition to be really good, and we need to be better than that. And so, our team is very focused on execution, and we're excited about Genoa. I think our customers are excited about Genoa. And so, we need to keep the momentum and keep the roadmap execution as strong as it has been.

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Q - Vivek Arya {BIO 6781604 <GO>}

Got it. And for my follow-up, you announced a $4 billion share buyback. I believe you kind of midway or late midway through Q2, you only did about $256 million of that. How should we think about buybacks going forward? Are you -- do you have a certain timeframe in mind? Just how -- what's going to guide your decision when and how much of buybacks to do? Thank you.

A - Devinder Kumar {BIO 17763436 <GO>}

Yes. I think no specific, Vivek. As you know, these programs, I mean, we'll be opportunistic and we will obviously return capital to the shareholder as the balance sheet continues to improve. We're very pleased to initiate the program in Q2 with about $256 million purchase and $3.2 million. And you will see us do more over time, but I wouldn't want to get into any specifics on this call.

Operator

Thank you. Your next question is coming from Matt Ramsay from Cowen and Company. Your line is now live.

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Q - Matt Ramsay {BIO 17978411 <GO>}

Thank you very much. Good afternoon, everybody. I guess, Lisa, one of the things I was really pleased to see in this set of results and investors have asked me about quite a bit is that you're delivering the revenue upside, but the operating margin leverage is coming with that. You guys have rightly been spending a ton to grow the business, and that's been reflected in the growth. And I just wonder how you're thinking about the balance of revenue growth versus delivering sort of upside to operating margins going forward because it's an item that's been a fulcrum from some investors in my conversations. Thanks.

A - Lisa Su {BIO 5791223 <GO>}

Sure, Matt. Maybe I'll start and then see if Devinder has anything to add. I think we've always been very thoughtful about how we both invest in the business as well as delivering operating leverage. And, look, I think our revenue growth has been very strong. It was certainly above what we had previously forecasted. We are taking the opportunity to invest in the business, and that's investing in R&D and investing in sales and marketing and really the overall capabilities there. But you do see the operating leverage in the business, and I think we intend to continue to deliver improved operating margins as we go forward. So, I think we can do all of those things. I think we can continue to grow revenue significantly above the industry. We will continue to invest in OpEx at a lower rate than the revenue growth, and we will continue to deliver operating margin improvement over time.

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A - Devinder Kumar {BIO 17763436 <GO>}

Yes, I think you covered it, Lisa. I think that's all said. I mean as you saw, we did update the guidance for OpEx as a percentage of revenue from about 26% to 25% for the year, and we continue to be discipline from a viewpoint of the investments we need to make to grow the business as well as obviously invest in R&D, go-to-market, hiring people is another area of focus right now as the business is growing pretty significantly.

Q - Matt Ramsay {BIO 17978411 <GO>}

Thank you both for that. As my follow-up, it's interesting, the more strength the PC market shows, it's almost like the more concern investors have that eventually we revert back towards the mean. And Lisa, your competitor gave some fairly bullish commentary about the state of the PC industry going forward. And I wonder if you might share your view and we've heard in our work a few bobbles in the Chromebook market and maybe a couple of PC OEMs saying they're building a tiny bit of CPU inventory.

So, on the back of that commentary about the market, if you have any views on your own visibility and inventory of AMD parts or maybe the gap between orders and your ability to fulfill them in the PC market, those things would be really helpful. Thank you.

A - Lisa Su {BIO 5791223 <GO>}

Yes. Sure, Matt. So, look, there are lots of different signals in the PC market. So, maybe I will make a few comments. I think it's fair to say that the end-user demand has been very strong. So, very strong in the first half of the year, very strong in the second half of last year and that's from all this work from home, school from home sort of and then some of this return to office trends. Within that, there is a little bit of a mix shift as you go through time.

When I look at the market, I would say that we performed very well. Within this market backdrop, we continue to gain revenue share. And what that means is, we're focusing on the most strategic segments of the PC market. As we go forward, I do agree that end-user demand is strong. I also believe that if you look at the second half of this year for the PC market, you'll hear about sort of pockets of component shortages or match sets and things like that. So, we're taking that into account as we think about the second half of the year.

From our perspective, we're planning the PC -- our PC business to be about flattish first half into second half. And again, we think that that's very well supported by all of the ordering patterns and all of our sort of look at what the PC OEMs are doing. From an inventory standpoint, we do not believe there's significant inventory. We do track it very closely of AMD product anyway, as we look at it at the retailers as well as at -- with our OEMs.So I think we have this very -- we're watching it very closely and recognize that the PC market may go up or down. We're expecting it to be, like I said, for our business roughly flattish first half into second half. And that being the case, we continue to believe that there is strong end user demand and there's just some supply matching that needs to happen in the marketplace.

Operator

Thank you. Our next question today is coming from John Pitzer from Credit Suisse. Your line is now live.

Q - John Pitzer {BIO 1541792 <GO>}

Yes. Good afternoon, Lisa. Thanks for letting me ask the question and congratulations on the solid results. Firstly, just a clarification. I think you said in your prepared comments relative to the June quarter that Epyc grew solidly double-digit sequentially. The overall segment grew about 19%. I'm just curious, did Epyc outgrow the overall segment, or was it more in line? Can you give us a sense of how it did relative to the segment?

A - Lisa Su {BIO 5791223 <GO>}

Yes. We outgrew the segment in the second quarter.

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Q - John Pitzer {BIO 1541792 <GO>}

Perfect. And then my second question is just more of a strategic question around pricing. Clearly, last week on their conference call, Intel talked about perhaps being a little bit more price aggressive, especially in data center to protect share. And I'd like to get kind of your thought on pricing. I mean, in my mind, that market is much more about a total cost of ownership than an entry point. And given your price performance, I'm just kind of curious as to how concerned you are about the pricing environment and how concerned do you think we should be over time?

A - Lisa Su {BIO 5791223 <GO>}

Yes. Thanks for that, John. Look, I think the market has always been competitive. I don't see that it has become more competitive or that's changed. As you said, pricing is not the first order variable when you're buying a server CPU. It really is about total cost of ownership. I think the performance leadership that we have is clearly there, and I think customers see that. So, we'll always fight for every socket. I mean, you know that we're very competitive in that fashion. But we think that the way to do that is with the strength of the roadmap and the strength of the deep partnerships and price is sort of a second order lever in this market.

Q - John Pitzer {BIO 1541792 <GO>}

Thank you.

Operator

Thank you. Your next question today is coming from Harlan Sur from JPMorgan. Your line is now live.

Q - Harlan Sur {BIO 6539622 <GO>}

Good afternoon and great job on the quarterly execution. Now with Milan on a strong ramp trajectory and also good to see the momentum in enterprise, as you guys continue to drive Epyc into new markets, just wanted to get an update on the pull in the telco service provider market, right. It's a relatively big market. It's about a $6 billion, $7 billion market. Milan supports much more networking functionality versus prior generations and operators continue to virtualize the core of their networks. And with 5G, they're also starting to virtualize their radio access networks. And so, just wanted to see if the team is seeing early momentum with Milan with telco equipment OEMs as well as with some of the large 5G service providers.

A - Lisa Su {BIO 5791223 <GO>}

Yes. Sure. Harlan, thanks for the question. Yes, look, we believe the telco segment is a very good segment for us. And I would say that there is a lot of interest. I wouldn't say it's a significant piece of revenue today. So, I view that as sort of opportunity as we continue to build out the solutions for Milan. But it is one of the areas that we believe is very strategic for AMD. And as Xilinx comes into -- so as we combined the Xilinx business with ours, I think their relationships as well in the communications and telco market will be helpful in

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just bringing the overall solution set together. So, yes, we think it's a good market for us, but I would say we're still very early on that particular cycle.

Q - Harlan Sur {BIO 6539622 <GO>}

Great. Thank you. And then on the strong early momentum in enterprise as you move into the second half and as you probably have some visibility into next year, because the enterprise call cycles are probably a bit longer than some of your cloud customers. Can you just talk about the breadth of the engagements in enterprise across large corporations and small- to medium-sized businesses?

A - Lisa Su {BIO 5791223 <GO>}

Yes, Harlan. So, we have seen a very strong pipeline and that started -- that started with Rome, but we see that expanding with Milan. I think if you look at the breadth of platform offerings from all the largest OEMs for Milan, it's just broader than our past generation. And I think people are also starting to come up with more appliances, and we've done quite a bit more ISV optimization as well. So, our visibility is very good into the second half of the year, and it's also very good into 2022.

I think the good piece about this, as you said, it is longer design cycles, but with large companies and certainly with some of the Tier 2 cloud guys, we've seen good strong visibility for multiple quarters. And then, as we think about sort of the small, medium business and more of the channel business, I think all of that is strong opportunity for us.

Operator

Thank you. Our next question is coming from Joe Moore from Morgan Stanley. Your line is now live.

Q - Joe Moore {BIO 17644779 <GO>}

Great. Thank you. I wonder if you could talk about the seasonality of the console business in the back half of the year. Is there any seasonality? Or does that continue to be kind of more of a supply constraint?

A - Lisa Su {BIO 5791223 <GO>}

Sure, Joe. So, the console business, we're quite early in the console cycle, and I think you've seen that there's very strong demand for those products. And so, I think the seasonality is not typical. So, typically, we see the second half stronger than the first half, and that is sort of more muted this year. So, there is some growth into the second half of the year, but it's not nearly what it is in a typical console seasonality.

Q - Joe Moore {BIO 17644779 <GO>}

Great. Thank you.

Operator

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Thank you. Our next question is coming from Stacy Rasgon from Bernstein Research. Your line is now live.

Q - Stacy Rasgon {BIO 16423886 <GO>}

Hi, guys. Thanks for taking my questions. Lisa, around the PC environment, so you sound a bit more sanguine about it versus your competitor who does seem to be calling for growth next year and maybe that's a function of some of the opportunities -- the other opportunities that you have. I'm just curious, given your other outlook for kind of continued strong growth, do you think that strong growth is dependent at all on the state of the PC market next year? So, for example, like a PC say we're down 10% next year. Do you still think you could still grow strongly year-over-year in 2022 off the rest of the portfolio?

A - Lisa Su {BIO 5791223 <GO>}

Yes. Sure, Stacy. So, look, I think -- I mean, there are lots of different signals in the PC market for 2022. So, I think what we're doing is taking, let's call it, we're planning for various different scenarios. But I would say that from our point of view, the overall answer to your question is yes. I mean, we believe that there is a -- we have strong growth momentum across the portfolio. And we believe that we will -- we can grow in the PC business as well even if the market is, let's call it, not as robust as some might forecast.

Our view is that we're still underrepresented across the board in the markets that we play in, whether you're talking about data center or PCs or gaming. And on the PC side, in particular, we're making very good progress in sort of commercial premium gaming notebooks, premium consumer. We have more platforms coming with our Ryzen 5000 and our next generation. So, I think our sort of outlook is less dependent on what exactly happens in the market. But obviously, we watch the market very closely, and we work with our OEM partners very closely to stay in tune with what they're seeing.

Q - Stacy Rasgon {BIO 16423886 <GO>}

Got it. Thank you. That's helpful. For my follow-up, I want to ask the OpEx question a little more explicitly. So, you did take it down for the year on your 25%. But if I'm doing my math right, the Q4 OpEx percentage is closer to 28%. And I get why I understand. But I think the Analyst Day model you've given, 16 months ago, had sort of an OpEx to revenue midpoint somewhere in the mid-26s. Should we think about OpEx, I guess, trending down from that exit rate to that more kind of like model level? Or are you still going to be taking this opportunity, at least for the next like several quarters maybe to invest at a bit of a higher level? Is that exit rate of OpEx to revenue more representative of what we might see in the near to medium term?

A - Devinder Kumar {BIO 17763436 <GO>}

Yes. I think, Stacy, first of all, you hit it right. The priority for this is to invest in the business for growth. We are growing significantly and just to cut the guidance. So, obviously, there's a lot of areas to invest in to support that growth, whether it's R&D or go-to-market or even hiring. Second half of the year, you also have salary increases that kick in for our

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employees. And obviously, that does drive the OpEx higher just given the guide we gave for Q3, which is higher than Q2 from an overall OpEx standpoint.

As far as the numbers are concerned, I know you're probably running your model there, but those numbers are approximate. And really, if you ask me from an overall standpoint, I would expect that for the year, we come in a little under 25%. We gave the approximate guidance of 25%, but I think will come in under 25% for the year. Nothing extraordinary there. It's just making sure we plan the business, support the growth and make sure that into 2022, as we have new product introductions that Lisa just talked about, we continue to support that because there are a lot of new products coming into 2022. So, really, that's what it is, Stacy.

Q - Stacy Rasgon {BIO 16423886 <GO>}

Got it. Thank you very much.

A - Lisa Su {BIO 5791223 <GO>}

Thank you, Stacy. Operator, two more questions, please.

Operator

Certainly. Our next question is coming from Blayne Curtis from Barclays. Your line is now live.

Q - Blayne Curtis {BIO 15302785 <GO>}

Hey. Thanks for letting me ask questions. I just want to ask on the graphic strength. I think you said it doubled. Just curious, is there a way to parse out how much is coming from crypto? And then, I think what I heard you say is in the back half, it's a driver for September. Just driving into December with PC slot again, kind of just maybe you could describe how much of the strength in graphics is kind of more client graphics versus the data center.

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A - Lisa Su {BIO 5791223 <GO>}

Yes. Sure, Blayne. So, to your question about the quarter -- second quarter, we do not believe there was a significant crypto component in our graphics revenue. I mean, the graphics revenue, as we see it, is really RDNA 2 ramping. We launched some new products in mobile and we're pleased with the reception of RDNA 2 in mobile as well as we started shipments of some of our data center GPUs. So, our view is that the crypto-based component is really negligible.

And then, as we go into the second half of the year, I wouldn't say graphics is the largest driver of our business. The driver really is around data center and that's data center across CPUs as well as some of the early ramp of the GPUs. But we do expect there continues to be strong demand for gaming graphics. And we know there are a lot of gamers out there who are still looking to get some of their cards. And so, we will support that demand. But I

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don't think crypto was a big piece of it, and we'll continue to focus our efforts on getting our gaming graphics over into the gamers' hands.

Q - Blayne Curtis {BIO 15302785 <GO>}

Thanks. And then maybe just a follow-up on the data center GPU opportunity. You've mentioned you have some new wins with HPC and a couple of them are fairly chunky. Just kind of curious when you think about that impact in the model, is that a next year story? Or is it a bit further out?

A - Lisa Su {BIO 5791223 <GO>}

Yes. So, I mean, we'll see some growth in the second half of the year off of a small base. I think it becomes a more meaningful driver as we go into next year and then certainly the following year. So, think about the data center GPU story as sort of the early innings of what we did on the CPU side. We're excited about the product, Blayne. I think it's a very exciting product with our next-generation CDNA 2. I think we have won some early wins with HPC. We're continuing to work with some cloud customers on the machine learning and AI aspects of it. But it's really a multiyear journey. And the larger driver of our data center business is the server CPU side.

Operator

Thank you. Our final question today is coming from Mark Lipacis from Jefferies. Your line is now live.

Q - Mark Lipacis {BIO 2380059 <GO>}

Hi. Thanks for taking my questions. Lisa, I had a question about your announcement with Google for their Tau instances. I thought it was fascinating because it looks like they're disabling one of the threads and running Milan in a single threaded mode, which seems to me like a throwback to 20 years ago. So, I had couple of questions on this.

I haven't seen Intel Xeon processors in this mode. Is there something about the AMD architecture, the Milan architecture beyond higher core count that just makes it more sense to use AMD processors in this mode versus Intel processors? Are you seeing a lot of demand outside of Google for this kind of single-threaded implementation? And if you are, would it make sense to make like a separate line of CPUs that streamlines the logic for only one processing thread. And then you could fit, potentially been a lot more course on the CPU and cut the power dissipation. It seems like it would be the next logical step. Would that even be feasible? Is that something you consider you're getting demand for? Thank you.

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A - Lisa Su {BIO 5791223 <GO>}

Sure. So, Mark, the way I would say is this, and again, I want to be a little bit sort of broad in how I answer the question. I think what you see in the server land is that there are lots of different use cases for the processors. And you have some that are looking for sort of the bleeding-edge performance and there the multi-threading is very, very useful, and

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you get better performance per watt performance per dollar and just overall socket level performance.

I think what we've seen is that as you look across use cases, there are some use cases where you're more focused on performance per dollar than overall performance, and you might choose to optimize sort of what you do, sort of how you configure the processor differently. I think what you'll see from us, Mark, is, we're spending a lot of time with our hyperscale partners. And what we want to do is offer them the type of incidence that they need and that their customers need. So, you'll see us do more customization across the board with the idea of we want to satisfy that range of performance that across sort of the entire range of use cases. So, I think we'll talk more about how we think about the roadmap as we go forward. But I will say that we're being very thoughtful in ensuring that we have the right product for the right workload and that it's optimized for performance and power and cost in all those areas.

Q - Mark Lipacis {BIO 2380059 <GO>}

Great. Thank you. Very helpful. Appreciate it.

A - Lisa Su {BIO 5791223 <GO>}

Thanks, Mark.

Operator

Thank you. We reached the end of our question-and-answer session. I'd like to turn the floor back over for any further or closing comments.

A - Laura Graves {BIO 15126067 <GO>}

Thank you, everyone. We appreciate your time today and certainly your interest in AMD. As always, we appreciate your support, and we look forward to seeing you in an event here in Q3. Have a great day.

Operator

Thank you. That does conclude today's teleconference and webcast. You may disconnect your line at this time, and have a wonderful day. We thank you for your participation today.

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