

Data Center Trends

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JANUARY 6TH, 2021

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3Q20 Worldwide Server Tracker: Revenue

IDC reported revenue in the worldwide server market grew 1.9% year over year to \$22.5B during the second quarter of 2020 (2Q20). However, 3Q20 Revenue is down Q/Q ~7% (compared to 2Q20 revenue of \$24B). 4Q20 Revenue is expected to be down Q/Q mid single digits.

Top 5 Companies, Worldwide Server Vendor Revenue, Market Share, and Growth, Third Quarter of 2020 *(Revenues are in US\$ Millions)*

Company	3Q20 Revenue	3Q20 Market Share	3Q19 Revenue	3Q19 Market Share	3Q20/3Q19 Revenue Growth
1. Dell Technologies	\$3,757.8	16.71%	\$3,779.1	17.12%	-0.6%
2. HPE/New H3C Group ^a	\$3,521.8	15.66%	\$3,737.9	16.93%	-5.8%
3. Inspur/Inspur Power Systems ^b	\$2,114.7	9.40%	\$1,973.3	8.94%	7.2%
4. Lenovo	\$1,326.0	5.90%	\$1,189.8	5.39%	11.4%
5. Huawei	\$1,098.9	4.89%	\$916.7	4.15%	19.9%
ODM Direct	\$6,303.3	28.03%	\$5,816.0	26.34%	8.4%
Rest of Market	\$4,367.9	19.42%	\$4,663.8	21.13%	-6.3%
Total	\$22,490.5	100.00%	\$22,076.6	100.00%	1.9%

Source: IDC Worldwide Quarterly Server Tracker, December 8, 2020

- Server revenue within China grew 14.2% year over year.
- Worldwide revenues for servers running AMD CPUs were up 107.2% year over year
- ARM-based servers grew revenues 430.2% year over year.

3Q20 Worldwide Server Tracker: Unit Shipments

IDC reported that Worldwide server shipments declined 0.3% year over year to ~3.1M units in 3Q20 and declined ~4% Q/Q (compared to ~3.2M in 2Q20). 4Q20 is expected to be down again Q/Q mid single digits.

Top 5 Companies, Worldwide Server Unit Shipments, Market Share, and Growth, Third Quarter of 2020					
Company	3Q20 Unit Shipments	3Q20 Market Share	3Q19 Unit Shipments	3Q19 Market Share	3Q20/3Q19 Unit Growth
1. Dell Technologies	502,409	16.41%	502,306	16.36%	0.0%
2. HPE/New H3C Group ^a	421,039	13.75%	459,395	14.96%	-8.3%
3. Inspur/Inspur Power Systems ^b	296,121	9.67%	314,975	10.26%	-6.0%
T4. Huawei*	177,729	5.80%	156,150	5.08%	13.8%
T4. Lenovo*	163,908	5.35%	204,040	6.64%	-19.7%
ODM Direct	989,024	32.30%	896,625	29.19%	10.3%
Rest of Market	511,482	16.71%	537,752	17.51%	-4.9%
Total	3,061,713	100.00%	3,071,244	100.00%	-0.3%
Source: IDC Worldwide Quarterly Server Tracker, December 8, 2020					

- China was the fastest growing region at 14.2% year over year.
- Asia/Pacific (excluding China and Japan) increased 3.0%, Japan declined 21.4% year over year.
- Latin America grew 1.5% and North America grew 1.1% year over year, (Canada at 13.1%, USA at 0.7%).
- EMEA declined 4.9%.

Intel Outlook, Trends

- Intel earnings fell 22% 3Q20 YoY. It was the first year-over-year decline in quarterly earnings for Intel in over four years. Sales dropped 4% to \$18.33 billion. Intel PC chip sales rose 1%, but data-center chip sales fell 7%. 4Q20 is expected to fall again mid single digits.
- Intel continues to offer deep discounts on case-by-case basis for Cascade Lake to preserve share.
- Intel IceLake 10nm sampling delayed to Feb/March 2021, volume production delayed to April/May 2021.
- ODM partners received Intel Eagle Stream 10nm+ (Sapphire Rapids) board/chipset samples in July, with CPU testing center available in Taiwan (initial CPU testing is not yet mature); volume ramp/launch expected to delay to C2H21.
- Intel 7nm will push out to late 2022 or 2023. Think that Intel may outsource some 7nm (<10%) to TSMC to kick start/avoid further roadmap delay to help catch up, then remain in-house foundry.
- According to Intel, their 10nm is equivalent to AMD's 7nm and Intel 7nm is equivalent to AMD 5nm.

Recent News for Intel

11/10/2020, Apple announced Mac computers using homegrown M1 chip, claims 3.5x faster performance faster than Intel-based Macs. Apple will be using TSMC for the M1 chips. Intel was getting 5.8% of total revenue from supplying CPUs to Apple. This will be a threat to Intel long term since Apple has been designing their own chips internally for a long time and this first volume chip is to test the waters. Apple can further tune the chip and turn it into a server chip.

12/18/2020, Bloomberg reported that Microsoft is designing their own chips for datacenter servers – think this is unlikely as Microsoft doesn't have a track record of doing so. Microsoft more likely will use a third-party ARM chip.

12/29/2020, Third Point CEO, Daniel Loeb, sent letter to Intel urging for change. Puts more pressure on Intel for strategic change.

AMD Outlook, Trends

- AMD reported 3Q20 revenue up 56% YoY and 45% Q/Q driven by higher revenue in both the Enterprise, Embedded and Semi-Custom and Computing and Graphics segments. This is 4th straight quarter with >25% YoY revenue growth. 4Q20 growth will moderate due to slower industry demand/hyperscale capacity digestion, but is still expected to continue to grow single digit Q/Q.
- Rome adoption continues to gain momentum worldwide. Continued production/release delays from Intel pushing ODM/customers to dedicate more resources to AMD and more customers may skip Intel IceLake.
- RFQs/RFPs from Enterprise and CSPs specifying AMD EPYC both in 4Q20 and continue to come out in high numbers in 1Q21.
- Milan launch will be Q1/Q2 2021. Hyperscale first, then Tier1/Tier2 CSP, followed by Enterprise/OEM.
- AMD high core count EPYC SKUs are selling well for AI/HPC workloads and in some cases replacing expensive Nvidia datacenter GPUs.
- AMD Gaming cards all sold out.
- Supply shortages noted for AMD due to unfulfilled upside requests.

Nvidia/GPU/AI Outlook, Trends

- Nvidia revenue up 57% YoY in 3Q20. Revenue in Gaming Market up 37% YoY, Datacenter Market up 162% YoY, but expects revenue from datacenter segment to decline in 4Q20.
- Expect 4Q20 Datacenter revenue to decline - probably partially due to slower demand from Microsoft and a Chinese customer not buying Mellanox networking products. Mellanox acquisition accounts for 13% of total company revenue and about a 1/3 of datacenter revenue.
- Nvidia V100/T4 lead times have improved, the official lead times are still ~12 week, but should be able to receive shipments within 8-10 weeks, Nvidia official A100 lead times are also 20+ weeks, but actual lead times are more flexible. Nvidia A100 supply is getting a little bit better for the broader market because U.S. hyperscale took so much of the supply at launch. With Microsoft demand cooling off, it's opened up supply to other customers. China hyperscale validation of Nvidia A100 expected to be completed by YE20, ramp starting 1Q21.
- AI/GPU demand will continue to be strong throughout 2021 and Nvidia is still the dominant market leader.
- Viable Datacenter Market competitors – Intel Habana Labs, Graphcore, AMD are getting more POCs, but not seeing volume ramp yet.
- Nvidia gaming cards are all sold out due to supply shortages as a result of upside.

Hardware Trends

➤ **Memory:**

- 4Q20 memory price went down 8-9% Q/Q, but prices started to climb back up at the end of Dec. 1Q21 prices are already up 3-5%.
- ASP increases due partly to Micron's DRAM fab power outage in Taiwan and strong demand in mobile/PC orders.
- Select hyperscale buyers secure greater on-hand/buffer inventories in an attempt to hedge against possible supply/price disruptions into C1Q21/CY21.

➤ **HDD:**

- Sharp drop in overall HDD unit shipments/demand in 3Q20.
- Nearline and mission critical HDD shipments flat/down in 4Q20 and into 1Q21.
- Seagate could experience a modest boost in shipments given their decision to maintain shipments to Huawei. Alternatively, Toshiba will be lower in 4Q20 and 1Q21 because of inability to ship to Huawei.
- Prices are flat in 2H20 and continue to be flat in 1Q21.
- 1Q21 expect improved China Enterprise (financial, gov't, telecom) air-based nearline HDD orders, but not enough to offset weak enterprise OEM HDD demand/orders and most U.S./China hyperscale buyers are still on inventory digestion in 1Q21 since 4Q20.

➤ **SSD/NVMe:**

- C1Q21 enterprise/datacenter ASP price down mid/high single-digits Q/Q, depending on supplier/buyer, volumes, interface/capacity.
- ASP expected to go up C2Q21/C2H21
- Continued supplier cost/margins pressures are likely to force additional supply/production controls which would potentially lead to ASP stabilization/inflation by C2Q21/C2H21

US Hyperscale

- Most U.S. hyperscale shipments projected decline Q/Q in 4Q20, with Amazon shipments the only U.S. hyperscale having modest Q/Q growth.
- U.S. hyperscale shipments could increase modestly 1Q21, with Google providing the strongest relative forecasts across component suppliers and ODM partners. Google is working with many countries/governments where Covid19 is rampant to help provide technology for online learning.
- Microsoft demand slowed since 4Q20 and expected to continue to be soft into 1Q21 due partly to inventory digestion and inability to deploy fast enough into datacenters because of Covid19. Total Microsoft server orders/shipments are currently projected decline slightly Y/Y in CY21.
- Amazon server demand is projected to grow double-digits Y/Y in 2021.
- Facebook is also expected to show steady server deployment growth in CY21.

China Hyperscale/CSP

- China hyperscale order pull-ins in 3Q20 impacted builds/shipments for 4Q20.
- China hyperscale component and infrastructure demand expect will still be soft in 1Q21 due to Chinese New Year (CNY) and ByteDance, Alibaba, and Tencent have built some inventory and pulled ahead demand from 4Q20 into 3Q20 and will likely still be consuming inventory in 1Q21.
- China Hyperscale spending is likely to recover in 1H21, driving a return to overall datacenter/server growth.

Views on 2021

- C1Q21 ODM server (L6/L10) shipments expected to decline another low/mid-single-digits Q/Q, with enterprise OEMs projecting another sequential decline.
- Hyperscale demand soft in 1Q21 and expected to recover in 2Q21. Enterprise demand will continue to be weak or be diverted into public cloud to remain viable/competitive. Expect Big Enterprise spend to recover in 2H21.
- Covid19 likely to impact datacenter deployments (due to shortage of labor) in 1H21 for US market.
- Supply chain disruptions are still expected in 1H21 due to second and third wave Covid19 rolling across different countries. 2H21 should be under control for recovery.
- Upcoming launch of Ice Lake/Milan to help drive recovery into C2Q21/C2H21.
- AMD should be able to gain ~20% server market share in 2021 if no supply constrains.
- AI/GPU workloads will continue to have high growth throughout 2021.
- Expect 1H21 to be weak and 2H21 to have high growth.