

CompTIA®



Tech Trade Snapshot

U.S. technology export trends and
trade-supported jobs analysis

National and statewide data

CompTIA.org #techtrade

INTRODUCTION

The growth of international trade is one of the defining trends of our time. While trade has shaped societies and economies for as long as societies and economies have existed, its impact over the past half century has been nothing short of extraordinary. During this time, trade volumes of goods and services increased 20-fold and topped \$25 trillion in 2019. And yet despite this growth, we are continuously reminded of how quickly disruptions can compromise the flow of goods and services between trade partners. The global COVID-19 pandemic is the most striking example of late. While many economies are on the path of recovery, the direct fallout could extend well into 2022 and the indirect repercussions likely much longer.

Technology plays a unique role in the international trade landscape. As a category, it represents one of the largest segments of U.S. trade. This reflects the insatiable demand of consumers and businesses for the latest and greatest in devices, applications, content – and by extension, the underlying digital infrastructure to make it all work. Additionally, as an enabling force, trade in technology goods and services creates its own virtuous cycle. The more technology is put into use, the more businesses and consumers have the tools to communicate, create, and exchange, thereby encouraging even more trade.



\$335 billion

Estimated value of U.S. exports of technology products and services in 2020

918,500

Estimated number of U.S. jobs in 2018 directly supported by U.S. technology exports to overseas customers

60%

Estimated percent of exports that directly support U.S. tech manufacturing jobs

32

Number of states exporting more than \$1 billion worth of technology products in 2020

\$1 in \$5

Exports account for approximately \$1 in every \$5 generated in the U.S. tech sector

2nd

Rank of technology services exports among all U.S. services export categories in 2020

\$55 billion

Estimated U.S. trade surplus in tech services in 2020

3rd

Rank of technology product exports among all U.S. goods export categories in 2020

ABOUT COMPTIA

The Computing Technology Industry Association (CompTIA) is a leading voice and advocate for the \$5 trillion global information technology ecosystem; and the more than 75 million industry and tech professionals who design, implement, manage, and safeguard the technology that powers the world's economy. Through education, training, certifications, advocacy, philanthropy, and market research, CompTIA is the hub for advancing the tech industry and its workforce.

ABOUT COMPTIA'S INTERNATIONAL TRADE REGULATION AND COMPLIANCE (ITRC) PRACTICE

CompTIA's International Trade Regulation & Compliance (ITRC) practice is focused on trade regulation and compliance. Our Customs Committee and Export Controls Committee consist of over 400 trade compliance and policy professionals from leading technology companies. CompTIA ITRC develops policy positions that support our members with their trade compliance programs, reducing risk and financial burdens. We advocate for streamlined, effective, clearly defined, and industry-informed customs regulations, export controls, and sanctions. To learn more, visit <https://connect.comptia.org/connect/public-sector/international-trade-regulation-compliance>

ABOUT THIS REPORT

This report provides data, analysis, and insight into the international trade market for information technology products and services. The underlying import and export statistics are compiled by the Foreign Trade Division of the U.S. Census Bureau, the U.S. International Trade Administration of the Department of Commerce, and the U.S. Bureau of Economic Analysis. The export-supported employment figures are compiled by The Trade Partnership's CDxports database. Additional CompTIA sources referenced in the report include Cyberstates and the IT Industry Outlook.

See Methodology page of this report for additional context, caveats, and details of the NAICS categories used to represent technology products and services. Questions can be directed to the CompTIA Research and Market Intelligence Department at research@comptia.org.

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OVERVIEW

U.S. information technology exports reached an estimated \$335 billion in 2020, a decrease of -4.9% from the previous year. The pandemic put the brakes on three consecutive years of positive U.S. exports growth. Despite the severity of the pandemic, however, U.S. exports of tech products and services held up relatively well. The chart at the bottom left depicts a few minor dips during April and May, but for the most part tech exports were steady during the year. Tech imports, interestingly, were trending downward several months prior to what could be characterized as the start of the pandemic in the United States.

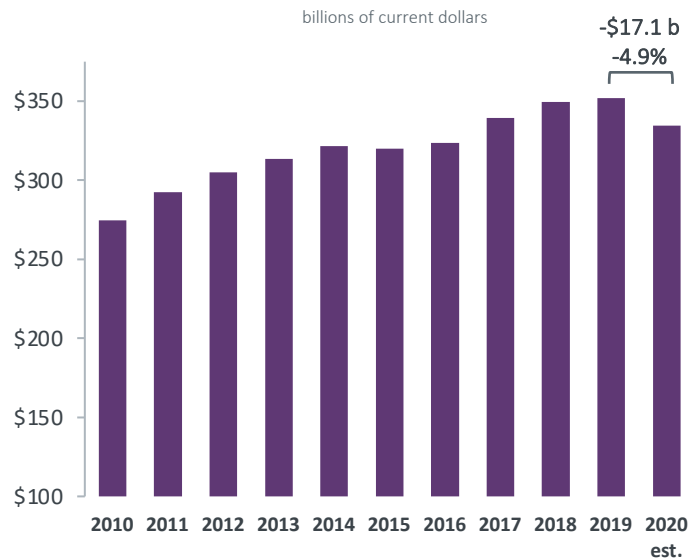
Growth in the tech sector, especially as it relates to international trade, is a function of many factors. Macro-technology trends, such as the ongoing push of digital business transformation, currency fluctuations, and government trade policies all have a bearing on growth. Combine those with economic conditions affecting customers mood to buy and “black swan” events such as the global pandemic, and you are dealing with multiple moving parts.

Analysis of export subsectors within the technology category reveal many of these facets. On a percent change basis, the services category encompassing custom software development services, cloud computing and data storage services and IT services led all technology export categories in growth at approximately 11.9% year-over-over.

The growth in tech services and the “everything-as-a-service” model have been driving forces in the tech sector over the past decade. The migration to cloud platforms, the modernization of legacy applications and workflows, and the mission-critical importance of data – and soon artificial intelligence (AI), translate to demand for expertise in integration, software development, data management, cybersecurity and related competencies categorized as technology services. Combined, these categories generated an additional \$33.3 billion of net-new revenue for U.S. companies over the past 10 years.

On the hardware products front, also referred to as manufactured goods, the semiconductors and components category recorded the most notable growth at 5.6% for the year, translating to \$3.3 billion in additional revenue. As an enabling technology used in countless products, demand for semiconductors was strong pre-pandemic and never really let up during the pandemic. With supply compromised, shortages of semiconductors became a serious economic and strategic concern. Post-pandemic, discussions increasingly focus on the importance of improving

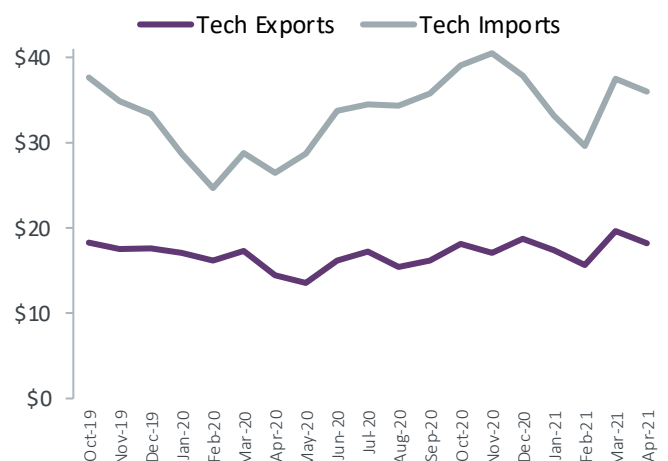
U.S. TECH PRODUCT + SERVICES EXPORTS



supply chain resiliency and rethinking the tradeoffs of manufacturing models such as just-in-time (JIT) inventory that may buckle under stress.

As important as tech services, applications, and data have been to growth, these categories can only thrive when there is a large installed base of devices (think users with computers, tablets, mobile phones, etc.) and robust infrastructure that reliably delivers faster service, higher capacity, and less costly computing and storage. Emerging technologies such as internet of things (IoT), edge computing, smart cities, and robotics require cutting edge processors and the components that form the “brains” of these intelligent solutions.

MONTHLY U.S. TECH PRODUCT EXPORTS



Like most countries, the U.S. is both a buyer and seller of technology. U.S. businesses and consumers purchased an estimated \$475 billion in technology products and services from overseas sellers in 2020. The net of technology exports from the U.S. and technology imports to the U.S. results in a trade deficit of approximately \$140 billion.

In tech services, the U.S. experienced a trade surplus of \$55 billion. Tech services have been a U.S. strength for the past decade with aggregate exports of nearly \$1.3 trillion resulting in a trade surplus of \$433 billion over the 10-year period. The software services category contributed the bulk of the positive surplus (87%) during this period, followed by R&D services, telecommunications services and database and data processing services. The IT services category reported an aggregate deficit of \$127.5 billion during the 2010-2020 period.

With tech products, the U.S. experienced a trade deficit of \$195 billion in 2020, a gap that widened by nearly \$15 billion year-over-year. This is consistent with the general slowdown in trade volumes due to the global pandemic. The largest deficit occurred in computers and peripherals, followed closely by the communications equipment category, where U.S. buyers purchased \$144 billion more in product from overseas buyers than overseas buyers purchased from U.S. providers.

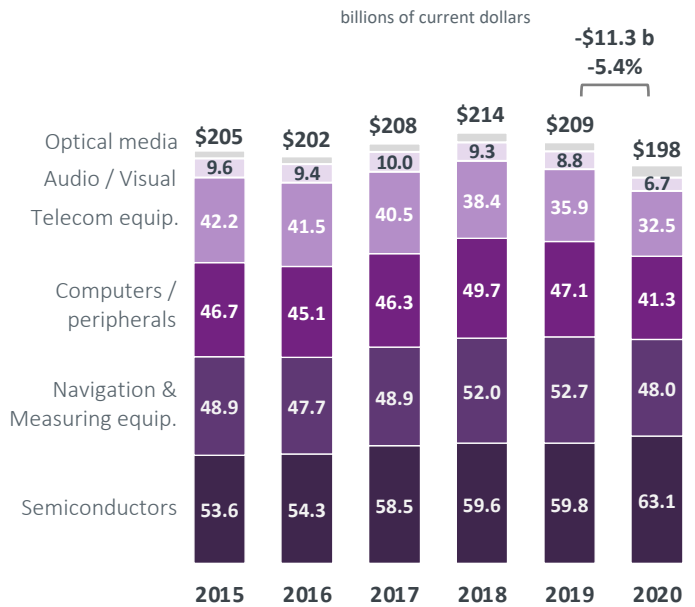
China accounted for 62% of the deficit in tech products' trade with the U.S., down from their 2019 rate of 71%. The U.S. also ran a deficit with Taiwan in 2020 (-\$22.4 billion), but a surplus with Hong Kong (+\$10.4 billion).

The next two largest trade imbalances for tech goods in 2020 belonged to Mexico (13% of the total deficit), and Viet Nam (12%).

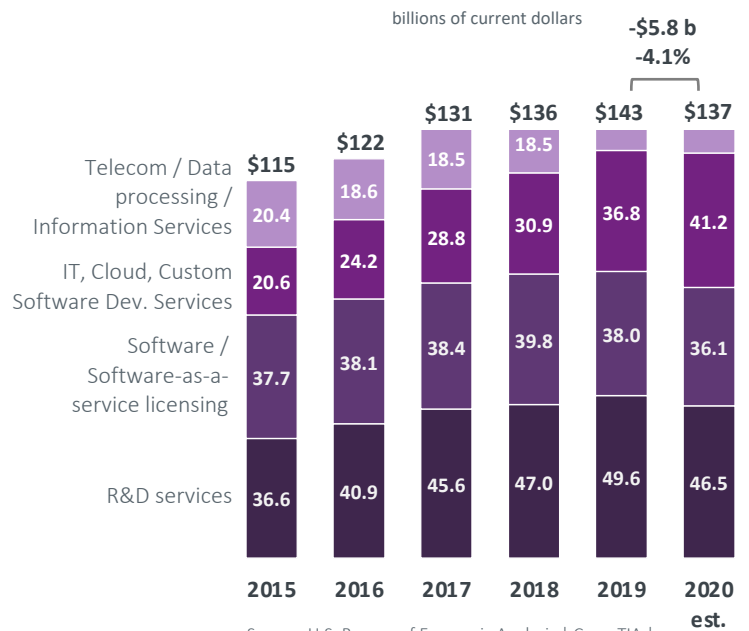
Note: because the U.S. runs a trade surplus with the vast majority of its tech goods trading partners (nearly 80% surplus vs. 20% deficit), as a percentage of the total trade balance, some figures may appear to exceed 100 percent, which is a function of offsetting figures in the surplus column.

The top destinations for U.S. exports in 2020 were nearly identical to the previous year. The top 10 markets for U.S. tech product exports remained unchanged, although a few countries swapped places in the ordering. The U.S. top markets list for tech services followed a similar pattern. The notable newcomer was China. See tables on following page.

U.S. TECH PRODUCT EXPORTS



U.S. TECH SERVICES EXPORTS



Debate over the meaning of trade deficits has been a topic of discussion since the earliest days of international economic analysis. Given the many complexities of trade, confusion and concern are not uncommon. Because of limitations in how trade statistics are calculated, deficits can be mischaracterized and misinterpreted, which can be especially problematic for the category of technology goods and services.

The classic example to illustrate these complexities is the iPhone. The mobile device is designed in the U.S. by Apple and then an estimated two hundred suppliers from around the world provide the materials and parts that go into the final product. Lastly, the phone is mostly assembled in China. When shipped back to the U.S. for domestic customers, the entire wholesale value of the device is counted as an import from China. According to the research consultancy IHS Market, Chinese assembly facilities account for about 3% - 6% of the total manufacturing costs of an iPhone, meaning nearly all the value flows to Apple and other suppliers.

As noted by Louis Kuijs, head of Asia economics research at Oxford Economics, “if trade deficits were measured to account for the complex nature of global supply chains for products such as smartphones, the U.S.-China trade deficit would be about 36% lower.” This is but one example. The same principle applies to many tech product categories.

LEADING TRADING PARTNERS FOR TECH PRODUCTS

Exports from the U.S.	Imports into the U.S.
1. Mexico	1. China
2. Canada	2. Mexico
3. China	3. Taiwan
4. Hong Kong	4. Viet Nam
5. Germany	5. Malaysia
6. Netherlands	6. South Korea
7. Japan	7. Thailand
8. Taiwan	8. Japan
9. South Korea	9. Germany
10. Singapore	10. Canada

Source: Foreign Trade Division of U.S. Census Bureau | CompTIA | 2020 data

Another limitation with trade statistics is the difficulty in accounting for avoidance behaviors. This typically entails sellers in one country shipping their product to an intermediary country that may have more favorable trade terms with the final market destination. Trade statistics for services continue to improve, but limitations remain with frequency and the level of detail, which also adds to less-than-ideal visibility into international trade patterns. In the aggregate the figures generally hold, but evaluating the trade relationship with any single market can quickly get murky because of these scenarios.

LEADING TRADING PARTNERS FOR TECH SERVICES

Exports from the U.S.	Imports into the U.S.
1. Ireland	1. India
2. Switzerland	2. Canada
3. Japan	3. Ireland
4. Singapore	4. United Kingdom
5. Canada	5. China
6. United Kingdom	6. Germany
7. Germany	7. Singapore
8. Netherlands	8. Israel
9. China	9. Netherlands
10. India	10. Mexico

Source: U.S. Bureau of Economic Analysis | CompTIA | 2019 data

International Trade Trends to Watch

A recent World Trade Organization (WTO) headline proclaimed “global trade primed for strong but uneven recovery after COVID-19 pandemic shock.” The WTO projects the volume of global goods trade will increase 8.0% in 2021, reversing the fall of -5.3% in 2020. In preparation for the next inevitable disruption to global trade, businesses will increase their focus on improving supply chain agility and supply chain risk management. AI-enabled tools, coupled with end-to-end IoT connectivity, will enhance the data streams needed to fine-tune decision-making and resource allocation. While technology will play a prominent role in these efforts, more businesses will also take a fresh look at reshoring and nearshoring models to manage supply chain risk. According to the UN’s *Global Trade Update 2021*, the advance of regional trade agreements (e.g. RCEP and AfCFTA) will affect a range of decisions on the production and consumption side of trade. Lastly, government trade policies and regulations will continue to be unpredictable. New tariff and non-tariff trade barriers will cast an ever-present shadow, while discussions of sustainability and equity will become more pressing.

TECHNOLOGY IS ONE OF THE LARGEST CATEGORIES OF U.S. EXPORTS

Exports are a measure of buyer perceptions of quality, value for money, and the degree to which the product or service aligns with business or user objectives. With these basic criteria in mind, the data confirms that technology is one of the most desired offerings among all U.S. exports.

In the manufactured goods category, technology ranks third, trailing the chemicals category and the transportation and motor vehicle. To help put into context, the dollar value of U.S. technology product exports is more than double that of the high-profile oil and gas products category.

In the services category, tech ranks second, accounting for 16% of total U.S. services exports. As noted previously, this affirms the macro trend toward a services orientation in the delivery of technology, as well as the market-leading position of many U.S. technology firms.

Analysis of tech exports at the state-level provides additional insights. As depicted in the accompanying chart, for 14 states, tech ranks as the #1 products export across all categories of state export activity. Interestingly, even though Texas is the largest exporter of tech products among all states, tech ranks third in the state behind the oil and gas category, and the petroleum and coal products category.

For seven states, tech products exports rank #2, and for eight other states, rank #3. In the aggregate, 29 states claim technology as a top 3 products export category.

TOP 5 U.S. SECTORS FOR MFG. GOODS EXPORTS

	\$ Billions	% of Total
1. Chemicals	\$199	14%
2. Transportation / motor vehicles	\$198	14%
3. Tech products	\$198	14%
4. Machinery	\$123	9%
5. Oil and gas	\$84	6%

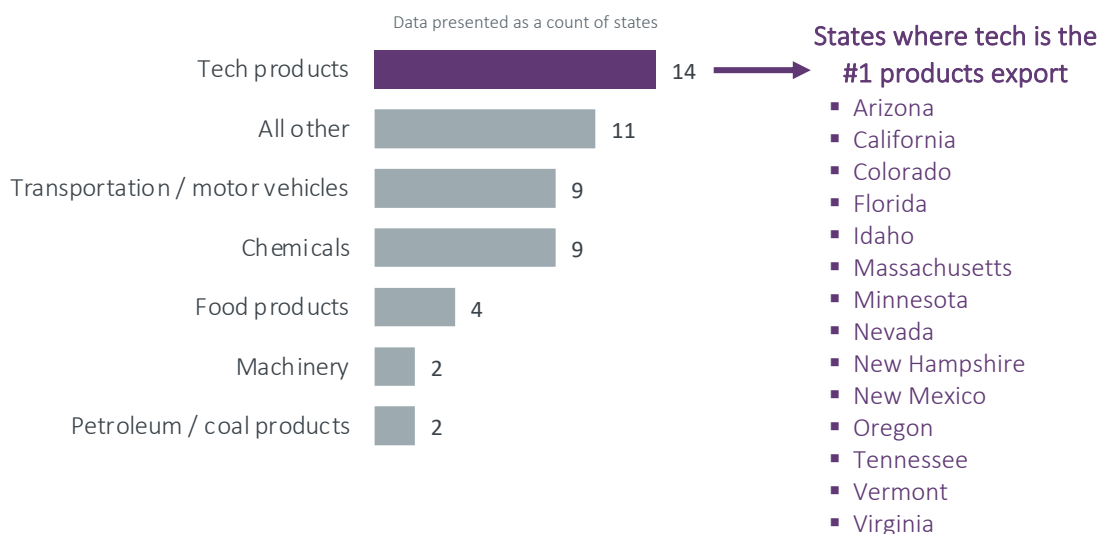
TOP 5 U.S. SECTORS FOR SERVICES EXPORTS

	\$ Billions	% of Total
1. Travel services	\$193	22%
2. Tech services	\$143	16%
3. Financial services	\$136	15%
4. Business & professional services	\$105	12%
5. Transportation services	\$91	10%

Source: Foreign Trade Division of U.S. Census Bureau | U.S. Bureau of Economic Analysis | CompTIA | Products data covers 2020 and services data covers 2019 time period

Note: a number of factors affect state-level international trade statistics. Product exported from state A may have inputs from states B and C; or product manufactured in state D may be assembled in state E and then stored in a warehouse in state F before leaving port in state G. Some of these factors even out in the aggregate, but others undoubtedly skew the results. See the U.S. [Guide to Foreign Trade Statistics](#) for more detail.

STATE DISTRIBUTION OF TOP PRODUCTS EXPORTS



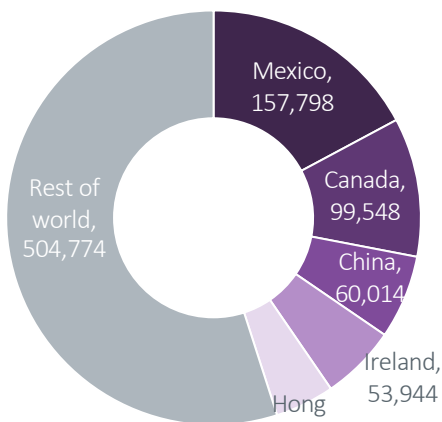
ASSESSING THE EMPLOYMENT IMPACT OF TRADE

U.S. technology exports directly supported an estimated 918,500 American jobs in 2018, the most recent year of available data at time of publication. During that period, export-supported jobs grew by 21,620 positions, an increase of 2.4% year-over-year. Tech goods accounted for 69% of exports-supported jobs, while tech services accounted for the remaining 31%. Tech services exports boosted employment in the U.S. by 9,463 jobs, a growth rate of 3.4%; in comparison, tech goods exports added 12,157 new jobs for a growth rate of 2.0%.

Applying the average wage for these tech industry sectors to the base of employment results in earnings of over \$113 billion – that is, the amount of money these workers will then spend in their local community and across the economy, including a portion spent in the form of taxes. These figures are compelling in their own right but there is more to the story.

Beyond the direct export-supported jobs, there is an additional indirect employment effect associated with trade. Technology development requires many inputs, starting with raw materials, but also various components and software layers. Technology also frequently acts as a platform and enabler, providing users the tool to run applications, pursue business activities, or enjoy entertainment content. The labor behind these inputs or technology ‘enhancements’ is connected to trade, but not directly. This approach can be taken even further

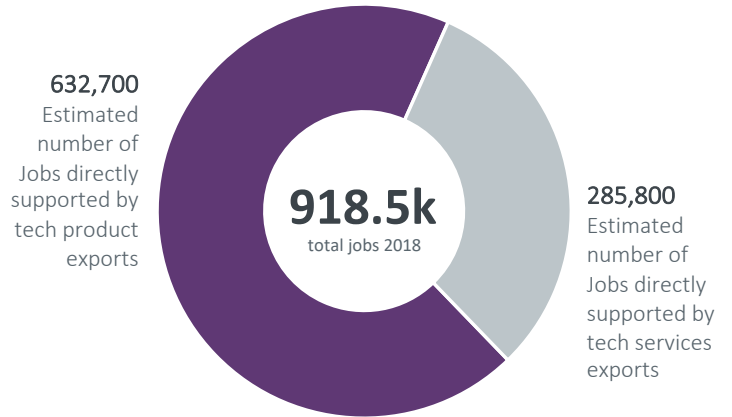
U.S. JOBS DIRECTLY SUPPORTED BY TECH EXPORTS BY MARKET



Source: Trade Partnership CDxports database | CompTIA | Data cover 2018 time period – most recent available data at time of publication

U.S. JOBS DIRECTLY SUPPORTED BY TECH EXPORTS

+2.4% YoY growth | +22K new jobs created



Source: Trade Partnership CDxports database | CompTIA | Data cover 2018 time period – most recent available data at time of publication

to include workers a step or two removed, such as law firms, shipping companies, marketing firms and so on. For the purposes of this report, only the workers directly supported by technology exports are covered.

On the imports side of the equation, there is a different, and more nuanced impact on employment. While trade creates jobs, it also inevitably has the opposite effect and can lead to employment shifts or displacements. In 2001, the primary technology manufacturing sector (NAICS 334) employed nearly 1.8 million American workers. By 2018, that figure fell to 1.1 million, a loss of 700,000 jobs. Undoubtedly, a portion of these job losses were due to global competition and offshoring. But there are other factors at play, including automation, process improvements, domestic competition, changing workforce characteristics, and the shift to often higher-margin software or tech services categories.

The challenge comes in trying to isolate these effects given that many of the variables are interconnected. Research from government agencies, think tanks, academics, and consultancies can vary widely in their assessment of the workforce impact of trade versus other factors. Some assert the trade impact is relatively small, while others believe unfair trade practices are a major culprit of manufacturing job losses.

For detailed state-by-state export-support employment figures, see CompTIA’s 2020 *Tech Trade Snapshot* report.

U.S. TECH PRODUCT EXPORTS DETAIL

Rank	State	2019	2020	2019-2020 Change	2019-2020 % Change
1.	Texas	49,376,034,931	44,854,154,003	-4,521,880,928	-9.2%
2.	California	40,206,920,463	37,566,946,407	-2,639,974,056	-6.6%
3.	Oregon	10,283,942,324	12,184,689,158	1,900,746,834	18.5%
4.	Florida	12,079,509,389	10,936,981,408	-1,142,527,981	-9.5%
5.	Illinois	7,768,551,855	6,975,580,606	-792,971,249	-10.2%
6.	New York	7,298,232,411	6,795,209,491	-503,022,920	-6.9%
7.	Massachusetts	6,787,031,532	6,158,372,635	-628,658,897	-9.3%
8.	Arizona	6,248,367,990	5,229,202,593	-1,019,165,397	-16.3%
9.	New Jersey	5,288,154,665	4,886,529,663	-401,625,002	-7.6%
10.	Tennessee	4,448,450,154	4,606,247,800	157,797,646	3.5%
11.	Washington	4,040,609,217	3,956,717,494	-83,891,723	-2.1%
12.	Pennsylvania	4,080,936,377	3,941,335,725	-139,600,652	-3.4%
13.	Nevada	2,104,239,351	3,651,959,330	1,547,719,979	73.6%
14.	Ohio	4,264,492,465	3,540,107,796	-724,384,669	-17.0%
15.	Minnesota	4,007,181,916	3,309,661,954	-697,519,962	-17.4%
16.	Georgia	3,012,197,243	3,010,969,300	-1,227,943	0.0%
17.	Wisconsin	2,611,181,204	2,728,963,503	117,782,299	4.5%
18.	Kentucky	2,039,740,795	2,651,068,828	611,328,033	30.0%
19.	Virginia	2,184,853,243	2,346,413,958	161,560,715	7.4%
20.	Michigan	2,892,197,520	2,270,077,945	-622,119,575	-21.5%
21.	North Carolina	2,217,609,086	2,161,123,078	-56,486,008	-2.5%
22.	Colorado	1,800,018,231	2,061,743,672	261,725,441	14.5%
23.	New Mexico	2,484,693,263	1,970,646,261	-514,047,002	-20.7%
24.	Utah	1,481,462,228	1,778,938,617	297,476,389	20.1%
25.	Indiana	1,683,603,575	1,635,123,734	-48,479,841	-2.9%
26.	New Hampshire	1,351,175,702	1,506,996,383	155,820,681	11.5%
27.	Vermont	1,974,231,208	1,443,273,071	-530,958,137	-26.9%
28.	South Carolina	1,511,386,717	1,301,814,113	-209,572,604	-13.9%
29.	Mississippi	1,325,914,456	1,232,330,354	-93,584,102	-7.1%
30.	Maryland	1,168,039,525	1,189,166,957	21,127,432	1.8%
31.	Connecticut	1,176,902,352	1,033,419,596	-143,482,756	-12.2%
32.	Kansas	892,818,785	814,686,271	-78,132,514	-8.8%
33.	Idaho	1,079,666,514	789,998,793	-289,667,721	-26.8%
34.	Oklahoma	844,439,821	751,044,197	-93,395,624	-11.1%
35.	Missouri	741,987,983	612,531,064	-129,456,919	-17.4%
36.	Iowa	646,541,495	605,552,961	-40,988,534	-6.3%
37.	Delaware	489,715,905	569,923,049	80,207,144	16.4%
38.	Alabama	662,426,076	458,135,025	-204,291,051	-30.8%
39.	Maine	321,981,343	306,206,022	-15,775,321	-4.9%
40.	Nebraska	215,807,684	212,992,038	-2,815,646	-1.3%
41.	District of Columbia	481,019,589	197,009,970	-284,009,619	-59.0%
42.	Louisiana	166,473,906	171,246,741	4,772,835	2.9%
43.	Rhode Island	157,068,110	142,113,454	-14,954,656	-9.5%
44.	Arkansas	135,111,420	125,448,866	-9,662,554	-7.2%
45.	North Dakota	78,326,809	75,716,558	-2,610,251	-3.3%
46.	South Dakota	86,049,295	69,596,437	-16,452,858	-19.1%
47.	West Virginia	121,261,262	63,456,531	-57,804,731	-47.7%
48.	Montana	44,596,403	38,485,008	-6,111,395	-13.7%
49.	Hawaii	26,515,986	31,040,144	4,524,158	17.1%
50.	Wyoming	16,709,665	14,084,838	-2,624,827	-15.7%
51.	Alaska	16,216,815	12,275,770	-3,941,045	-24.3%

Source: Foreign Trade Division of U.S. Census Bureau | CompTIA

EXPORTS, IMPORTS AND TRADE BALANCE

TECH EXPORTS FROM U.S.	Type	2016	2017	2018	2019	2020
Computer Equipment	Products	45,128,683,263	46,274,987,035	49,686,086,190	47,122,509,134	41,273,974,990
Communications Equipment	Products	41,542,550,823	40,477,017,030	38,356,040,984	35,896,344,320	32,460,190,009
Audio & Video Equipment	Products	9,397,996,268	10,038,407,463	9,273,411,233	8,789,410,063	6,683,805,719
Semiconductors & Components	Products	54,317,801,891	58,518,677,204	59,603,183,013	59,782,211,811	63,100,535,625
Navigational & Meas. Instruments	Products	47,739,197,006	48,858,499,976	51,966,905,203	52,675,146,507	48,000,005,599
Magnetic & Optical Media	Products	3,632,386,855	4,066,413,586	4,668,116,649	4,615,467,359	6,057,205,628
Software Licenses and Packaged Software	Services	38,149,000,000	38,406,000,000	39,796,000,000	37,954,000,000	36,099,000,000
Telecommunications Services	Services	11,446,000,000	10,220,000,000	9,045,000,000	7,825,000,000	5,924,000,000
Custom Software Development Services	Services	14,942,000,000	18,173,000,000	19,792,000,000	23,804,000,000	26,626,636,798
Cloud Computing and Data Storage Services	Services	2,442,000,000	3,207,000,000	3,761,000,000	6,141,000,000	6,869,189,068
IT Services	Services	6,859,000,000	7,458,000,000	7,352,000,000	6,882,000,000	7,698,055,556
Database and Other Information Services	Services	7,118,000,000	8,303,000,000	9,412,000,000	10,703,000,000	7,437,150,477
Research and Development Services	Services	40,928,000,000	45,550,000,000	46,977,000,000	49,614,000,000	46,474,000,000
Tech Products Subtotal	Subtotal	201,758,616,106	208,234,002,294	213,553,743,272	208,881,089,194	197,575,717,570
Tech Services Subtotal	Subtotal	121,884,000,000	131,317,000,000	136,135,000,000	142,923,000,000	137,128,031,899
Total	Total	323,642,616,106	339,551,002,294	349,688,743,272	351,804,089,194	334,703,749,469

TECH IMPORTS INTO U.S.	Type	2016	2017	2018	2019	2020
Computer Equipment	Products	86,731,865,238	96,872,996,864	105,561,872,086	103,756,603,703	115,253,367,915
Communications Equipment	Products	116,365,960,390	125,317,129,498	121,719,538,340	111,613,562,668	102,573,365,808
Audio & Video Equipment	Products	34,110,235,675	31,916,659,477	31,201,936,388	30,486,232,159	32,458,436,140
Semiconductors & Components	Products	74,257,090,315	81,090,253,378	85,858,933,250	75,128,270,338	77,070,014,877
Navigational & Meas. Instruments	Products	52,995,092,122	54,311,373,212	57,466,052,107	57,548,722,698	51,096,364,828
Magnetic & Optical Media	Products	8,203,683,310	10,614,988,136	11,317,658,161	10,945,891,157	14,510,685,395
Software Licenses and Packaged Software	Services	8,013,000,000	9,868,000,000	11,256,000,000	11,981,000,000	10,737,000,000
Telecommunications Services	Services	5,800,000,000	5,766,000,000	5,897,000,000	5,105,000,000	4,536,000,000
Custom Software Development Services	Services	11,423,000,000	13,152,000,000	13,139,000,000	13,301,000,000	11,347,021,872
Cloud Computing and Data Storage Services	Services	1,014,000,000	883,000,000	758,000,000	537,000,000	458,112,228
IT Services	Services	19,095,000,000	20,658,000,000	20,178,000,000	20,682,000,000	17,643,718,995
Database and Other Information Services	Services	2,318,000,000	2,556,000,000	2,512,000,000	4,080,000,000	4,175,648,352
Research and Development Services	Services	35,531,000,000	37,059,000,000	34,828,000,000	33,772,000,000	33,128,000,000
Tech Products Subtotal	Subtotal	372,663,927,050	400,123,400,565	413,125,990,332	389,479,282,723	392,962,234,963
Tech Services Subtotal	Subtotal	83,194,000,000	89,942,000,000	88,568,000,000	89,458,000,000	82,025,501,447
Total	Total	455,857,927,050	490,065,400,565	501,693,990,332	478,937,282,723	474,987,736,410

TRADE BALANCE (exports - imports)	Type	2016	2017	2018	2019	2020
Computer Equipment	Products	-41,603,181,975	-50,598,009,829	-55,875,785,896	-56,634,094,569	-73,979,392,925
Communications Equipment	Products	-74,823,409,567	-84,840,112,468	-83,363,497,356	-75,717,218,348	-70,113,175,799
Audio & Video Equipment	Products	-24,712,239,407	-21,878,252,014	-21,928,525,155	-21,696,822,096	-25,774,630,421
Semiconductors & Components	Products	-19,939,288,424	-22,571,576,174	-26,255,750,237	-15,346,058,527	-13,969,479,252
Navigational & Meas. Instruments	Products	-5,255,895,116	-5,452,873,236	-5,499,146,904	-4,873,576,191	-3,096,359,229
Magnetic & Optical Media	Products	-4,571,296,455	-6,548,574,550	-6,649,541,512	-6,330,423,798	-8,453,479,767
Software Licenses and Packaged Software	Services	30,136,000,000	28,538,000,000	28,540,000,000	25,973,000,000	25,362,000,000
Telecommunications Services	Services	5,646,000,000	4,454,000,000	3,148,000,000	2,720,000,000	1,388,000,000
Custom Software Development Services	Services	3,519,000,000	5,021,000,000	6,653,000,000	10,503,000,000	15,279,614,926
Cloud Computing and Data Storage Services	Services	1,428,000,000	2,324,000,000	3,003,000,000	5,604,000,000	6,411,076,840
IT Services	Services	-12,236,000,000	-13,200,000,000	-12,826,000,000	-13,800,000,000	-9,945,663,440
Database and Other Information Services	Services	4,800,000,000	5,747,000,000	6,900,000,000	6,623,000,000	3,261,502,125
Research and Development Services	Services	5,397,000,000	8,491,000,000	12,149,000,000	15,842,000,000	13,346,000,000
Tech Products Subtotal	Subtotal	-170,905,310,944	-191,889,398,271	-199,572,247,060	-180,598,193,529	-195,386,517,393
Tech Services Subtotal	Subtotal	38,690,000,000	41,375,000,000	47,567,000,000	53,465,000,000	55,102,530,452
Total	Total	-132,215,310,944	-150,514,398,271	-152,005,247,060	-127,133,193,529	-140,283,986,941

Source: Foreign Trade Division of U.S. Census Bureau | U.S. Bureau of Economic Analysis | CompTIA

EXPORT-SUPPORTED JOBS BY TOP STATES

For detailed employment figures by state, see CompTIA's *Tech Trade Snapshot 2020* report. Export-supported employment figures will be updated when they become available. At present, 2018 is the most recent available data.

Rank	Top States for Tech <u>Product</u> Export-Supported Jobs (2018)	Rank	Top States for Tech <u>Services</u> Export-Supported Jobs (2018)
1.	Texas	1.	California
2.	California	2.	Washington
3.	Florida	3.	Massachusetts
4.	Oregon	4.	Texas
5.	Massachusetts	5.	New York
6.	New York	6.	North Carolina
7.	Illinois	7.	Virginia
8.	Arizona	8.	New Jersey
9.	New Jersey	9.	Georgia
10.	Tennessee	10.	Colorado
11.	Ohio	11.	Maryland
12.	Washington	12.	Pennsylvania
13.	Minnesota	13.	Illinois
14.	Georgia	14.	Oregon
15.	Pennsylvania	15.	Florida
16.	Michigan	16.	Utah
17.	Wisconsin	17.	Indiana
18.	Virginia	18.	Wisconsin
19.	North Carolina	19.	Connecticut
20.	New Mexico	20.	Minnesota
21.	Nevada	21.	Arizona
22.	Vermont	22.	Missouri
23.	Colorado	23.	Michigan
24.	Idaho	24.	District of Columbia
25.	Indiana	25.	Ohio

Source: Source: Trade Partnership CDxports database | CompTIA

METHODOLOGY

Sizing the technology industry has become increasingly challenging. This stems from the ongoing blurring of lines between what constitutes tech, as well as how tech is categorized by government statistics agencies. For example, for an automobile company exporting its own autonomous vehicle technology or a financial services firm providing fintech data services abroad, some portion of the value of these activities will not be captured by export statistics as currently categorized. Some of the inputs used by automotive companies or financial services companies, such as semiconductors, will be captured in tech manufacturing, but if companies are developing their own software or other technology internally, for example, it will not be captured. Because these scenarios are becoming more prevalent, there is some degree of undercounting of tech products and services exports.

This report relies on a set of categories defined by the NAICS codes used by government agencies. While any categorization system has limitations, relying on established NAICS ensures consistency in tracking data over time and in comparisons across states, regions, and industry sectors.

As it relates to totals, in some cases the sum of the underlying states will not exactly match the reported figure at the national level. This is due to a portion of imports or exports categorized as 'unallocated' and the presence of a small amount of trade attributed to U.S. territories.

As it relates to trade-supported employment figures, the U.S. Office of Trade and Economic Analysis states, "given the data used to estimate jobs supported by state-level exports, care should be taken in the interpretation of the results. The figures presented should best be thought of as representing the number of jobs supported by the exports from a state as opposed to the number of jobs supported by exports within a state."

It is not uncommon for government agencies to issue revisions to past data. In some cases, revisions could span many years. *CompTIA's Tech Trade Snapshot* uses the most current data at time of publication. However, past reports could become outdated due to data revisions.

For additional detail and methodology on state services exports and jobs tied to exports, see The Trade Partnership's CDxports database:
<http://tradepartnership.com/data/cdxports-and-cdxjobs/>

For additional data on manufactured goods exports, see the U.S. International Trade Administration. For additional data on services exports, see U.S. Bureau of Economic Analysis.

NAICS Manufactured goods categories

334	Computer and Electronic Products
3341	Computer Equipment
3342	Communications Equipment
3343	Audio / Video Equipment
3344	Semiconductors / Components
3345	Navigational / Measuring / Control Instruments
3346	Magnetic / Optical Media

NAICS Services categories

517	Telecommunications services
518	Data processing, hosting, and related services
5112	Software publishers
5415	IT services / computer systems design services
54171	R&D services / R&D in physical, engineering,





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