RESEARCH REPORT

CompTIA

Tech Trade Snapshot 2019

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

National and statewide data

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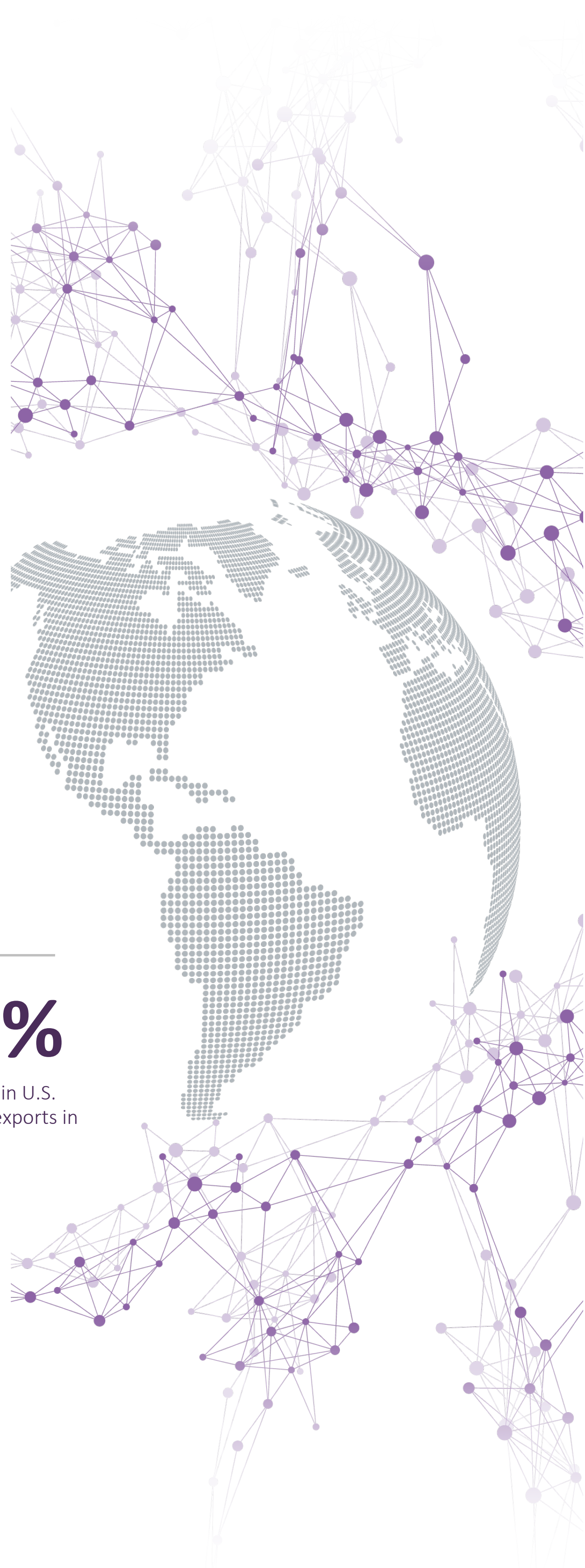
#techtrade

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 now top $23 trillion. As a percentage of global GDP, exports now account for nearly one-third of global economic activity, a 100 percent increase since 1970[1].

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.



$338 billion

Estimated value of U.S. exports of technology products and services in 2018

858,000

Number of U.S. jobs directly supported by U.S. technology exports to overseas customers

50%

Exports directly support approximately 50% U.S. tech manufacturing jobs

39

Number of states recording positive exports-supported jobs growth in 2018

2.5%

Growth rate in U.S. technology exports in 2018

$1 in $4

Exports account for approximately $1 in every $4 generated in the U.S. tech sector

2nd

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

$40 billion

U.S. trade surplus in tech services

2nd

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

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 50 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.

CompTIA champions industry innovation, a skilled workforce and solutions that drive business at the federal, state, local and international levels. CompTIA gives eyes, ears and a voice to technology companies, informing them of policy developments – and providing the means to do something about it.

CompTIA advocates for trade policies that expand export destinations and open new markets for the U.S. technology sector. For more details on CompTIA's trade work, visit:

https://www.comptia.org/advocacy/policy-issues/global-trade-and-market-access.

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.

OVERVIEW

U.S. information technology exports reached an estimated $338 billion in 2018, an increase of 2.5 percent over the previous year. Growth slowed slightly compared to the 2017 rate of 4.5 percent. Since 2010, U.S. exports of technology added nearly $65 billion in new earnings and aggregate growth of 23 percent.

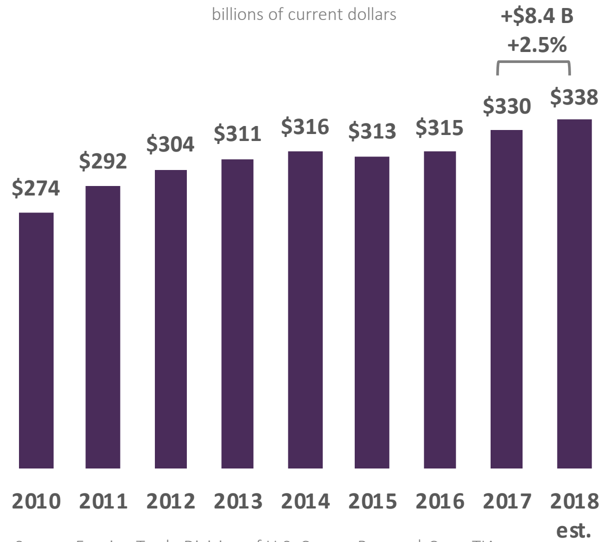
Growth in the tech sector, especially as it relates to international trade, is a function of many factors. Macro technology trends, such as the ongoing push of digital business transformation, combined with economic conditions – are customers in the mood to buy, currency fluctuations, and government trade policies all have a bearing on growth.

Analysis of the export subsectors within the technology category reveal many of these factors. On a percent change basis, the information and data processing services subsector led all technology export categories in growth at 15.2 percent. The IT services category and the software/software-as-a-service category also performed well, recording growth of 5.9 percent and 4.5 percent, respectively. 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 computing, 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.

On the hardware front, also referred to as manufactured goods, the computing equipment category recorded the highest export growth at 7.4 percent. This was followed by navigational, measuring, and control equipment category (6.3 percent), and semiconductors and components (1.6 percent). 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, 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.

U.S. TECH PRODUCT + SERVICES EXPORTS

billions of current dollars



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

The one export category that notably lagged was telecommunications. Exports of communications equipment hardware fell -6.0 percent, a loss of $2.5 billion in revenue, while telecommunications services dropped -8.1 percent, a loss of nearly $900 million in revenue compared to the prior year. For context, the overall U.S. telecom market for equipment, services, and employment has been sluggish the past couple of years. In many markets, traditional wired telecom along with segments of wireless telecom, can be considered mature categories. Moreover, as the transition to 5G gets underway, both telecom providers and customers must contend with the uncertainty that comes with any disruptive shift.

37 Number of states that recorded positive growth in exports of tech services in 2018

Like most countries, the U.S. is both a buyer and seller of technology. U.S. businesses and consumers purchased nearly $500 billion in technology goods and services from overseas sellers in 2018. The net of technology exports from the U.S. and technology imports to the U.S. results in a trade deficit of nearly $161 billion.

In tech services, the U.S. experienced a trade surplus of nearly $40 billion in 2018, a figure that grew 10.5 percent over the previous year. This is driven heavily by U.S. software (+$29.5 billion surplus), followed by information and data processing services (+$7.2 billion surplus).

In tech goods, the U.S. experienced a trade deficit of slightly over $200 billion in 2018, a figure that grew by 4.1 percent year-over-year. The largest deficit occurred in the communications equipment category, where U.S. buyers purchased $83.7 billion more in goods from overseas buyers than overseas buyers purchased from U.S. providers. The computing equipment category recorded a deficit of -$56.8 billion, followed by semiconductors (-$25.5 billion), and audio and video equipment (-$22.3 billion).

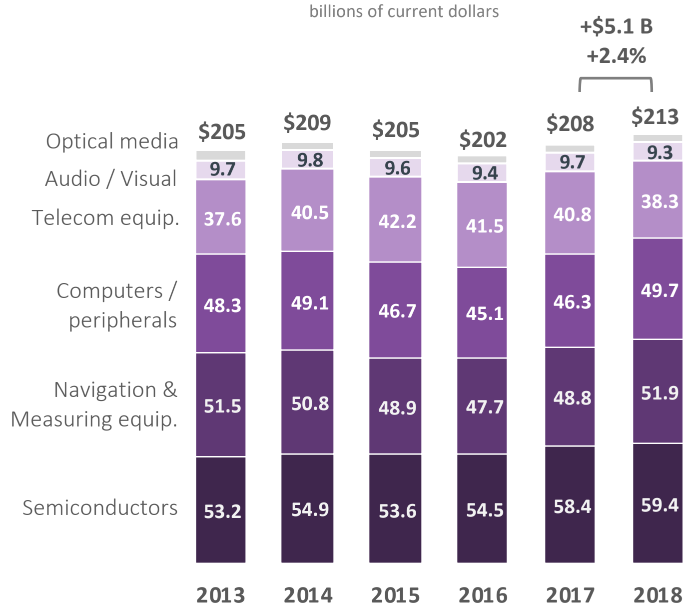
China accounted for 84 percent of the deficit in tech goods trade with the U.S., down slightly from their 2017 rate of 87 percent. Since 2010, China's share of the tech goods trade deficit has fluctuated between a high of 97 percent and a low of 84 percent. The next two largest trade imbalances for tech goods in 2018 belong to Malaysia (10 percent of the total deficit), and Mexico (also 10 percent).

Note: because the U.S. runs a trade surplus with the vast majority of its tech goods trading partners (82 percent surplus vs. 18 percent 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 2018 was nearly identical to the previous year. The top four markets for U.S. tech product exports remained unchanged, while at #5, Germany moved up one slot, switching places with Japan at #6. U.S. tech services exports followed a similar pattern, with the top 10 markets consistent with the prior year. The one notable newcomer to the list was Hong Kong appearing at #10. See tables on following page.

U.S. TECH PRODUCT EXPORTS

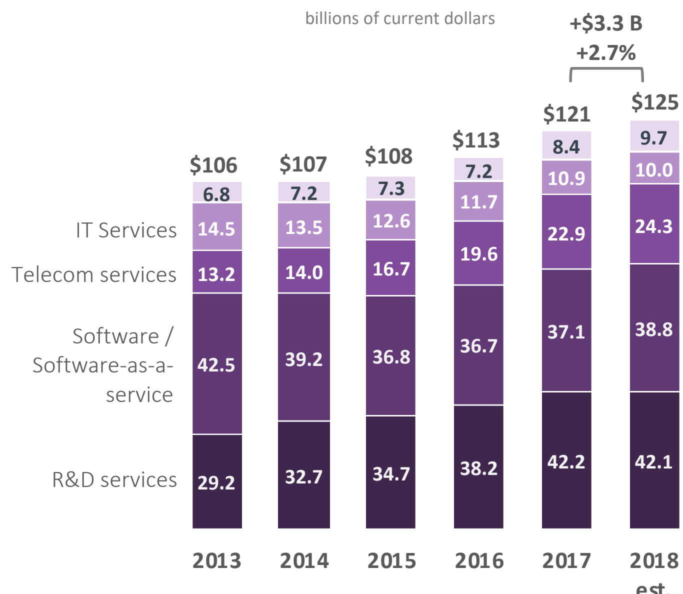
billions of current dollars



Source: Foreign Trade Division of U.S. Census Bureau | CompTIA | rounding may affect totals percent change calculations

U.S. TECH SERVICES EXPORTS

billions of current dollars



Source: U.S. Bureau of Economic Analysis | CompTIA | rounding may affect totals percent change calculations

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 technology goods and services.

For example, the iPhone 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 the research consultancy IHS Market, Chinese assembly facilities capture only 3 to 6 percent of the total manufacturing costs of an iPhone, meaning nearly all of 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 percent lower." This is but one example. The same principle applies to many tech product categories. See CompTIA's supplemental brief for additional details on U.S.-China tech trade.

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.	Malaysia
4.	Hong Kong	4.	Taiwan
5.	Germany	5.	Japan
6.	Japan	6.	South Korea
7.	Netherlands	7.	Thailand
8.	South Korea	8.	Vietnam
9.	Taiwan	9.	Germany
10.	Singapore	10.	Canada

Source: Foreign Trade Division of U.S. Census Bureau | CompTIA | 2018 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. For example, tech goods from China sent first to Mexico and then onto the U.S. market. The data indicates Mexico recorded the largest gain of any country exporting tech goods to the U.S. market: +$5.5 billion in new sales or an increase of 9.2 percent. 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.	Ireland
3.	United Kingdom	3.	Canada
4.	Japan	4.	United Kingdom
5.	Singapore	5.	Germany
6.	Canada	6.	China
7.	Germany	7.	Israel
8.	Brazil	8.	Japan
9.	Netherlands	9.	Singapore
10.	Hong Kong	10.	Netherlands

Source: U.S. Bureau of Economic Analysis | CompTIA | 2017 data

Strengthening U.S. Dollar adds another concern to the mix

The ICE Dollar Index, which measures the dollar against a basket of six other currencies, has increased more than 5 percent during the past 12 months. The Index has risen steadily since early 2018 based on the strength of the U.S. economy and rising U.S. interest rates. A strong dollar provides greater purchasing power, making international travel or imports relatively cheaper for U.S. buyers. The tradeoff, though, U.S. exports become more expensive to many overseas buyers. The combination of new tariffs and a strengthening dollar mean many U.S. companies could face a "double whammy" of competitive pressures.

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 second, trailing the transportation and motor vehicle category. To help put into context, the dollar value of U.S. technology product exports is more than double that of petroleum and coal products.

In the services category tech also ranks second, accounting for 15 percent 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 11 states, tech ranks as the #1 goods export across all categories of state export activity. Interestingly, even though Texas is the largest exporter of tech goods among all states, tech ranks 3rd in the state behind the oil & gas category, and the petroleum & coal products category.

For six states, tech products exports rank #2, and for 11 other states, rank #3. In the aggregate, 28 states claim technology as a top 3 goods export category.

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

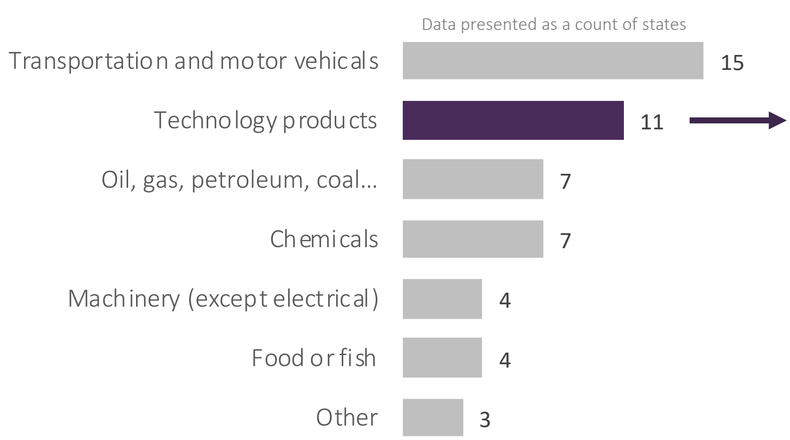
	$ Billions	% of Total
1. Transportation / motor vehicles	$283	17%
2. Tech products	$213	13%
3. Chemicals	$208	12%
4. Machinery	$143	9%
5. Petroleum & coal products	$103	6%

TOP 5 U.S. SECTORS FOR SERVICES EXPORTS

	$ Billions	% of Total
1. Travel services	$211	26%
2. Tech services	$121	15%
3. Business & professional services	$112	14%
4. Financial services	$110	14%
5. Intellectual property use (not software)	$91	11%

Source: Foreign Trade Division of U.S. Census Bureau | U.S. Bureau of Economic Analysis | CompTIA | Goods data covers 2018 and services data covers 2017 time period

STATE DISTRIBUTION OF TOP GOODS EXPORTS



States where tech is the #1 goods export

- Arizona
- California
- Colorado
- Florida
- Idaho
- Massachusetts
- Minnesota
- New Hampshire
- New Mexico
- Oregon
- Vermont

ASSESSING THE EMPLOYMENT IMPACT OF TRADE

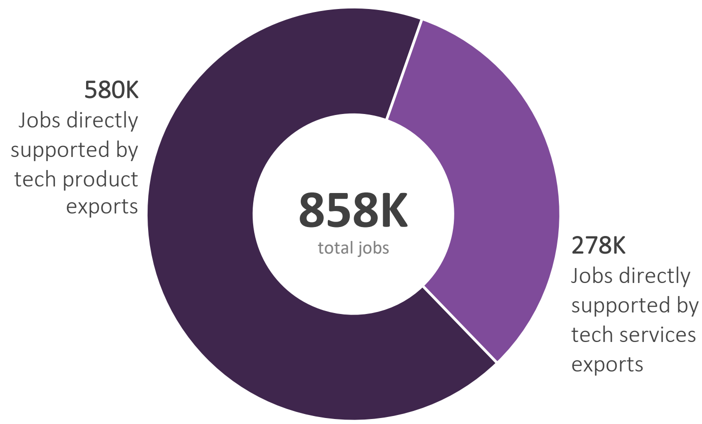
U.S. technology exports directly supported an estimated 858,000 American jobs in 2017, the most recent year of available data. During that time period, export-supported jobs grew by 43,000 positions, an increase of 5.2 percent year-over-year. Tech goods account for 68 percent of exports-supported jobs, while tech services account for the remaining 32 percent. Tech services exports boosted employment in the U.S. by 23,000 jobs, a growth rate of 9 percent; in comparison, tech goods exports added 19,667 new jobs for a growth rate of 3.5 percent.

Applying the average wage for these tech industry sectors to the base of employment results in earnings of over $105 billion – that is, the amount of money these workers will then spend in their local community and across the economy. 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 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.

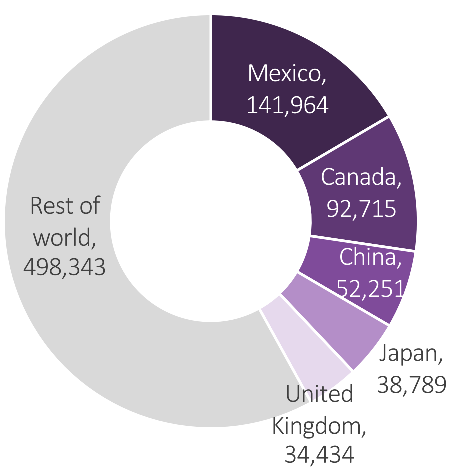
U.S. JOBS DIRECTLY SUPPORTED BY TECH EXPORTS

+5.2% YoY growth | +43K new jobs created



Source: Trade Partnership CDxports database | CompTIA | Data cover 2017 time period

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



Source: Trade Partnership CDxports database | CompTIA | Data cover 2017 time period

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 to 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.

STATE RANKINGS

U.S. tech product exports numeric change growth 2017-2018		U.S. tech product exports % change growth 2017-2018	
1.	California	1.	Ohio
2.	Ohio	2.	North Dakota
3.	Texas	3.	Montana
4.	Georgia	4.	Georgia
5.	Minnesota	5.	Virginia
6.	Virginia	6.	Minnesota
7.	Arizona	7.	Nebraska
8.	New Jersey	8.	Mississippi
9.	New York	9.	Connecticut
10.	Massachusetts	10.	South Carolina

U.S. tech services exports numeric change growth 2016-2017		U.S. tech services exports % change growth 2016-2017	
1.	California	1.	South Carolina
2.	Washington	2.	Maine
3.	Texas	3.	Alabama
4.	Massachusetts	4.	Kansas
5.	Virginia	5.	Montana
6.	Colorado	6.	Nevada
7.	Georgia	7.	California
8.	North Carolina	8.	Missouri
9.	Maryland	9.	Nebraska
10.	Indiana	10.	Iowa

Tech export-supported jobs numeric change growth 2016-2017		Tech export-supported jobs % change growth 2016-2017	
1.	California	1.	Delaware
2.	New Jersey	2.	District of Columbia
3.	Washington	3.	Wyoming
4.	Florida	4.	Oklahoma
5.	Massachusetts	5.	New Hampshire
6.	New York	6.	Nevada
7.	Illinois	7.	Montana
8.	Georgia	8.	Kentucky
9.	Indiana	9.	Indiana
10.	Arizona	10.	New Jersey

Source: Foreign Trade Division of U.S. Census Bureau | U.S. Bureau of Economic Analysis | Trade Partnership | CompTIA | Jobs data covers employment directly supported by exports

U.S. TECH PRODUCT EXPORTS DETAIL

Rank	State	2017	2018	2017-2018 Change	2017-2018 % Change
1.	Texas	$46,969,203,414	$47,894,768,172	$925,564,758	2.0%
2.	California	$43,670,701,034	$45,138,079,588	$1,467,378,554	3.4%
3.	Florida	$12,956,419,775	$13,067,284,574	$110,864,799	0.9%
4.	Illinois	$8,584,694,931	$8,590,428,005	$5,733,074	0.1%
5.	Massachusetts	$7,455,610,947	$7,672,503,247	$216,892,300	2.9%
6.	Oregon	$8,760,011,440	$7,538,863,246	-$1,221,148,194	-13.9%
7.	New York	$7,105,167,035	$7,359,282,098	$254,115,063	3.6%
8.	Arizona	$5,873,411,865	$6,336,950,129	$463,538,264	7.9%
9.	New Jersey	$5,041,241,717	$5,464,733,402	$423,491,685	8.4%
10.	Tennessee	$5,390,099,760	$4,619,352,215	-$770,747,545	-14.3%
11.	Washington	$4,243,477,352	$4,419,899,305	$176,421,953	4.2%
12.	Minnesota	$3,651,027,990	$4,244,772,134	$593,744,144	16.3%
13.	Ohio	$2,796,990,512	$3,929,823,182	$1,132,832,670	40.5%
14.	Pennsylvania	$3,603,137,492	$3,464,511,851	-$138,625,641	-3.8%
15.	Georgia	$2,722,728,806	$3,402,462,538	$679,733,732	25.0%
16.	Michigan	$3,300,542,901	$3,060,738,277	-$239,804,624	-7.3%
17.	Wisconsin	$2,741,881,745	$2,830,869,504	$88,987,759	3.2%
18.	Virginia	$2,026,618,439	$2,499,593,807	$472,975,368	23.3%
19.	North Carolina	$2,248,655,790	$2,237,511,199	-$11,144,591	-0.5%
20.	Nevada	$1,910,283,307	$2,120,676,153	$210,392,846	11.0%
21.	New Mexico	$1,867,716,338	$2,029,773,999	$162,057,661	8.7%
22.	Colorado	$1,920,002,743	$1,930,476,263	$10,473,520	0.5%
23.	Vermont	$1,755,586,932	$1,905,323,072	$149,736,140	8.5%
24.	Kentucky	$1,800,514,566	$1,865,375,217	$64,860,651	3.6%
25.	Indiana	$1,804,975,220	$1,782,638,041	-$22,337,179	-1.2%
26.	Idaho	$1,653,233,476	$1,702,530,557	$49,297,081	3.0%
27.	Utah	$1,847,812,388	$1,568,108,842	-$279,703,546	-15.1%
28.	New Hampshire	$1,632,356,919	$1,399,266,430	-$233,090,489	-14.3%
29.	South Carolina	$1,250,305,459	$1,389,871,342	$139,565,883	11.2%
30.	Mississippi	$1,113,431,623	$1,280,576,656	$167,145,033	15.0%
31.	Connecticut	$1,131,151,700	$1,260,018,124	$128,866,424	11.4%
32.	Maryland	$1,089,998,031	$1,039,751,962	-$50,246,069	-4.6%
33.	Oklahoma	$814,751,324	$894,190,633	$79,439,309	9.8%
34.	Kansas	$703,041,033	$761,020,132	$57,979,099	8.2%
35.	Missouri	$632,953,314	$631,841,206	-$1,112,108	-0.2%
36.	Iowa	$647,159,502	$606,249,485	-$40,910,017	-6.3%
37.	Alabama	$522,996,340	$544,089,473	$21,093,133	4.0%
38.	Delaware	$751,814,245	$521,676,689	-$230,137,556	-30.6%
39.	Maine	$326,409,545	$341,802,572	$15,393,027	4.7%
40.	Nebraska	$215,864,275	$250,801,052	$34,936,777	16.2%
41.	District of Columbia	$257,361,186	$249,573,446	-$7,787,740	-3.0%
42.	Rhode Island	$168,140,742	$172,635,004	$4,494,262	2.7%
43.	Arkansas	$191,035,929	$170,810,993	-$20,224,936	-10.6%
44.	Louisiana	$178,641,500	$162,568,829	-$16,072,671	-9.0%
45.	West Virginia	$123,798,958	$122,213,789	-$1,585,169	-1.3%
46.	South Dakota	$87,903,053	$86,918,030	-$985,023	-1.1%
47.	North Dakota	$60,527,300	$79,598,883	$19,071,583	31.5%
48.	Montana	$35,082,487	$45,260,140	$10,177,653	29.0%
49.	Alaska	$23,704,556	$23,236,608	-$467,948	-2.0%
50.	Hawaii	$21,187,991	$21,119,757	-$68,234	-0.3%
51.	Wyoming	$17,429,295	$14,059,878	-$3,369,417	-19.3%

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

U.S. TECH SERVICES EXPORTS DETAIL

Rank	State	2016	2017	2016-2017 Change	2016-2017 % Change
1.	California	$32,285,435,787	$36,442,487,837	$4,157,052,050	12.9%
2.	Washington	$14,208,006,909	$14,972,936,022	$764,929,113	5.4%
3.	Massachusetts	$8,200,037,710	$8,631,386,582	$431,348,872	5.3%
4.	Texas	$5,673,313,724	$6,201,311,146	$527,997,422	9.3%
5.	New York	$5,877,923,599	$5,934,598,916	$56,675,316	1.0%
6.	North Carolina	$4,405,573,548	$4,576,958,588	$171,385,040	3.9%
7.	Georgia	$3,741,883,051	$3,918,351,223	$176,468,172	4.7%
8.	New Jersey	$3,627,127,510	$3,752,115,174	$124,987,664	3.4%
9.	Colorado	$3,214,717,904	$3,423,229,490	$208,511,586	6.5%
10.	Pennsylvania	$3,295,701,609	$3,369,439,243	$73,737,634	2.2%
11.	Virginia	$2,733,851,652	$3,022,833,503	$288,981,850	10.6%
12.	Maryland	$2,580,308,680	$2,732,459,243	$152,150,563	5.9%
13.	Oregon	$2,353,796,623	$2,483,888,025	$130,091,403	5.5%
14.	Illinois	$2,440,065,931	$2,418,599,215	-$21,466,716	-0.9%
15.	Florida	$2,127,676,735	$2,209,910,118	$82,233,382	3.9%
16.	Wisconsin	$1,727,534,474	$1,706,840,702	-$20,693,772	-1.2%
17.	Utah	$1,605,908,672	$1,695,479,820	$89,571,148	5.6%
18.	Indiana	$1,521,484,452	$1,672,976,012	$151,491,559	10.0%
19.	Connecticut	$1,491,689,008	$1,530,730,109	$39,041,101	2.6%
20.	Minnesota	$1,420,767,193	$1,373,605,306	-$47,161,888	-3.3%
21.	Arizona	$1,042,978,505	$1,154,549,009	$111,570,504	10.7%
22.	Michigan	$1,105,113,285	$1,110,586,673	$5,473,387	0.5%
23.	Missouri	$963,074,257	$1,084,947,679	$121,873,422	12.7%
24.	Ohio	$961,245,704	$911,063,100	-$50,182,604	-5.2%
25.	District of Columbia	$802,665,991	$884,679,509	$82,013,518	10.2%
26.	New Hampshire	$647,519,480	$690,101,589	$42,582,109	6.6%
27.	Kansas	$527,694,208	$604,515,899	$76,821,690	14.6%
28.	New Mexico	$402,893,823	$417,083,401	$14,189,578	3.5%
29.	Alabama	$284,483,852	$326,404,340	$41,920,487	14.7%
30.	Iowa	$225,221,908	$249,931,931	$24,710,023	11.0%
31.	South Carolina	$205,683,230	$240,231,465	$34,548,235	16.8%
32.	Tennessee	$210,182,630	$221,589,845	$11,407,215	5.4%
33.	Idaho	$194,382,485	$212,461,430	$18,078,946	9.3%
34.	Nebraska	$178,132,628	$200,063,062	$21,930,434	12.3%
35.	Rhode Island	$132,239,461	$121,413,504	-$10,825,958	-8.2%
36.	Arkansas	$125,443,038	$116,350,757	-$9,092,281	-7.2%
37.	Vermont	$106,662,059	$112,689,249	$6,027,190	5.7%
38.	North Dakota	$126,881,373	$105,949,164	-$20,932,209	-16.5%
39.	Kentucky	$98,048,881	$103,135,547	$5,086,666	5.2%
40.	Oklahoma	$110,220,681	$101,752,467	-$8,468,214	-7.7%
41.	Nevada	$73,484,063	$83,063,350	$9,579,287	13.0%
42.	Maine	$62,093,918	$71,287,481	$9,193,563	14.8%
43.	Delaware	$61,049,676	$66,599,786	$5,550,110	9.1%
44.	Mississippi	$43,901,384	$42,750,469	-$1,150,916	-2.6%
45.	Alaska	$43,050,539	$37,541,121	-$5,509,417	-12.8%
46.	Louisiana	$32,371,188	$35,049,615	$2,678,427	8.3%
47.	West Virginia	$31,589,154	$30,679,341	-$909,813	-2.9%
48.	Hawaii	$29,659,370	$28,325,526	-$1,333,844	-4.5%
49.	South Dakota	$27,193,302	$26,624,756	-$568,545	-2.1%
50.	Montana	$22,738,502	$25,832,258	$3,093,756	13.6%
51.	Wyoming	$4,296,649	$3,610,404	-$686,245	-16.0%

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

U.S. JOBS DIRECTLY SUPPORTED BY TECH EXPORTS

Rank	State	Tech Product Export Jobs 2017	Tech Services Export Jobs 2017	Total Tech Export Jobs 2017	2016-2017 Change	2016-2017 % Change
1.	California	123,002	82,759	205,761	20,385	11.0%
2.	Texas	145,051	15,310	160,360	-1,242	-0.8%
3.	Washington	10,889	31,456	42,346	2,929	7.4%
4.	Florida	35,031	4,917	39,948	2,912	7.9%
5.	Massachusetts	19,574	19,727	39,302	2,340	6.3%
6.	Oregon	26,874	5,409	32,283	-2,897	-8.2%
7.	New York	18,902	12,554	31,456	2,175	7.4%
8.	Illinois	19,712	6,230	25,942	2,115	8.9%
9.	New Jersey	14,669	9,342	24,010	3,091	14.8%
10.	Arizona	16,356	2,933	19,289	1,025	5.6%
11.	North Carolina	6,373	10,458	16,831	-62	-0.4%
12.	Tennessee	15,773	489	16,262	338	2.1%
13.	Pennsylvania	9,321	6,722	16,043	104	0.7%
14.	Georgia	7,733	8,308	16,041	1,422	9.7%
15.	Virginia	5,882	9,172	15,054	582	4.0%
16.	Colorado	5,147	7,929	13,076	755	6.1%
17.	Minnesota	9,463	3,423	12,886	519	4.2%
18.	Michigan	8,152	2,831	10,983	601	5.8%
19.	Wisconsin	7,139	3,593	10,731	-466	-4.2%
20.	Ohio	7,398	2,252	9,650	647	7.2%
21.	Maryland	2,747	6,708	9,454	-380	-3.9%
22.	Indiana	5,189	3,766	8,955	1,162	14.9%
23.	Utah	4,948	3,869	8,817	585	7.1%
24.	New Mexico	6,307	919	7,225	-492	-6.4%
25.	Connecticut	2,712	3,417	6,129	256	4.4%
26.	New Hampshire	4,385	1,606	5,991	1,016	20.4%
27.	Idaho	5,033	478	5,511	-1,254	-18.5%
28.	Nevada	5,277	205	5,481	904	19.7%
29.	Vermont	5,120	288	5,409	-439	-7.5%
30.	Kentucky	4,894	231	5,124	723	16.4%
31.	Missouri	1,700	2,902	4,602	393	9.3%
32.	South Carolina	3,248	533	3,781	209	5.9%
33.	Mississippi	3,057	68	3,125	362	13.1%
34.	Kansas	1,612	1,437	3,049	293	10.6%
35.	District of Columbia	564	2,150	2,714	662	32.2%
36.	Oklahoma	2,460	165	2,625	494	23.2%
37.	Alabama	1,564	830	2,394	38	1.6%
38.	Delaware	1,926	183	2,108	740	54.1%
39.	Iowa	1,476	576	2,052	201	10.9%
40.	Nebraska	562	593	1,154	103	9.8%
41.	Maine	920	178	1,097	24	2.2%
42.	Rhode Island	433	374	807	0	0.0%
43.	Arkansas	536	215	751	-245	-24.6%
44.	Louisiana	416	63	479	13	2.7%
45.	North Dakota	144	211	355	-2	-0.7%
46.	West Virginia	276	65	341	20	6.2%
47.	South Dakota	269	41	310	17	5.7%
48.	Montana	80	65	145	21	16.7%
49.	Hawaii	49	59	108	-34	-24.2%
50.	Alaska	58	45	104	-1	-0.7%
51.	Wyoming	38	5	43	9	26.3%
	TOTAL	580,435	278,061	858,496	42,673	5.2%

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, 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."

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/

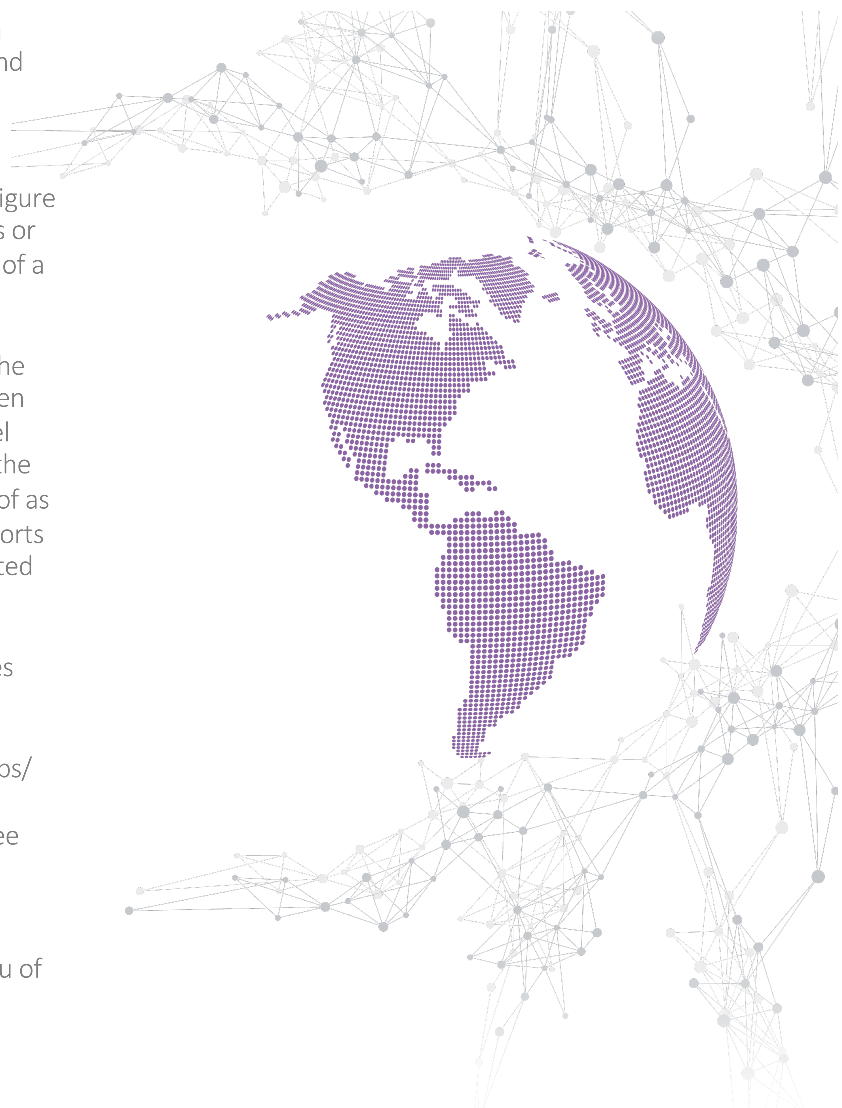
For additional data on manufactured goods exports, see the U.S. International Trade Administration:
http://tse.export.gov/tse/tsehome.aspx.

For additional data on services exports, see U.S. Bureau of Economic Analysis:
https://www.bea.gov/iTable/index_ita.cfm.

[1]Data from World Bank and IMF

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,



APPENDIX

Total tech exports (product + service), 2018	
1.	California
2.	Texas
3.	Washington
4.	Massachusetts
5.	Florida
6.	New York
7.	Oregon
8.	Illinois
9.	New Jersey
10.	Arizona

Tech services exports as a % of state's total tech exports		Tech services %
1.	Washington	77.9%
2.	District of Columbia	77.5%
3.	Maryland	71.5%
4.	North Carolina	67.1%
5.	Colorado	64.1%
6.	North Dakota	63.6%
7.	Missouri	63.2%
8.	Alaska	61.3%
9.	Virginia	59.9%
10.	Georgia	59.0%

Estimated tech exports as a % of state GDP, 2017		%
1.	Vermont	6.2%
2.	Oregon	5.4%
3.	Washington	4.4%
4.	Texas	3.4%
5.	Massachusetts	3.4%
6.	California	3.3%
7.	New Hampshire	3.2%
8.	Idaho	2.9%
9.	New Mexico	2.7%
10.	Arizona	2.5%

Sources for data tables above: Foreign Trade Division of U.S. Census Bureau | U.S. Bureau of Economic Analysis | EMSI | CompTIA

Global tech hubs put spotlight on the ingredients for innovation

The ingredients of innovation have never been more accessible. With little more than a broadband connection and a credit card, a startup can spin up powerful, scalable compute and storage capacity with minimal investment. Add in open source code, stackable technologies, talent marketplaces, and creative financing and the ingredients are all there for innovation to flourish. The data bears this out as tech hubs have sprouted up across the globe (think Toronto, Nairobi, Budapest, Singapore, Stockholm, Dubai, and Sao Paulo, to name just a few). While Silicon Valley and other U.S. cities remain dominant players, their share of the total "innovation pie" may shrink as a percentage of the total due to accelerating growth in markets around the world. This means the next breakthrough in fintech, smart cities, AI, robotics, quantum computing, or 'to-be-determined' could occur in any number of global tech hubs. Countries looking to leapfrog ahead increasingly pursue efforts to enhance their appeal, which typically starts with building the most tech-savvy workforce possible. Other efforts may revolve around support for R&D, public-private partnerships that facilitate the efficient transfer and deployment of technology, or targeted innovation policies. Lastly, factors such as livability, affordability, and openness cannot be overlooked when the competition for talent extends beyond borders.

For complete CompTIA IT Industry Outlook report: https://www.comptia.org/resources/it-industry-trends-analysis

APPENDIX

TECH EXPORTS FROM U.S.	Type	2014	2015	2016	2017	2018 est.
Computer / peripheral equipment	Product	49,080,733,680	46,748,140,492	45,132,566,351	46,271,543,602	49,677,528,139
Communications equipment	Product	40,458,336,822	42,156,979,791	41,540,861,800	40,766,405,698	38,318,513,503
Audio / video equipment	Product	9,771,035,582	9,613,922,984	9,397,643,017	9,746,555,937	9,267,222,018
Semiconductors / components	Product	54,890,642,780	53,647,436,281	54,497,349,384	58,435,368,109	59,363,158,185
Navigational / Measuring / Instruments	Product	50,829,332,583	48,869,406,979	47,733,225,761	48,836,679,667	51,924,230,221
Magnetic / Optical Media	Product	4,090,878,039	3,659,784,001	3,632,262,402	4,068,184,434	4,665,115,397
IT / computer services	Service	13,991,000,000	16,707,000,000	19,626,000,000	22,941,000,000	24,290,000,000
Information / data processing services	Service	7,160,000,000	7,285,000,000	7,186,000,000	8,399,000,000	9,673,000,000
R&D and testing services	Service	32,731,000,000	34,743,000,000	38,159,000,000	42,191,000,000	42,080,000,000
Telecommunications services	Service	13,539,000,000	12,587,000,000	11,736,000,000	10,879,000,000	9,996,000,000
Software / software-as-a-service	Service	39,177,000,000	36,791,000,000	36,708,000,000	37,081,000,000	38,757,000,000
Tech product subtotal	Subtotal	209,120,959,486	204,695,670,528	201,933,908,715	208,124,737,447	213,215,767,463
Tech services subtotal	Subtotal	106,598,000,000	108,113,000,000	113,415,000,000	121,491,000,000	124,796,000,000
Total	Total	315,718,959,486	312,808,670,528	315,348,908,715	329,615,737,447	338,011,767,463

TECH IMPORTS INTO U.S.	Type	2014	2015	2016	2017	2018 est.
Computer / peripheral equipment	Product	92,509,650,327	91,761,230,070	86,741,584,959	96,988,166,769	105,971,921,597
Communications equipment	Product	107,494,759,454	114,257,343,252	116,276,096,281	125,354,123,196	121,791,960,511
Audio / video equipment	Product	36,164,782,078	36,806,046,053	34,229,264,339	32,065,406,521	31,328,118,779
Semiconductors / components	Product	71,396,990,764	72,152,679,185	74,259,569,345	81,128,232,622	86,059,732,451
Navigational / Measuring / Instruments	Product	53,382,595,888	54,195,101,018	53,061,560,034	54,414,390,502	57,604,085,308
Magnetic / Optical Media	Product	5,654,007,533	6,865,400,319	8,204,312,791	10,613,819,883	11,275,090,328
IT / computer services	Service	27,285,000,000	27,940,000,000	29,531,000,000	31,956,000,000	32,239,000,000
Information / data processing services	Service	2,461,000,000	2,483,000,000	2,370,000,000	2,619,000,000	2,472,000,000
R&D and testing services	Service	30,869,000,000	32,256,000,000	34,133,000,000	35,344,000,000	35,163,000,000
Telecommunications services	Service	6,757,000,000	6,281,000,000	5,490,000,000	5,478,000,000	5,706,000,000
Software / software-as-a-service	Service	6,714,000,000	6,795,000,000	7,593,000,000	9,957,000,000	9,284,000,000
Tech product subtotal	Subtotal	366,602,786,044	376,037,799,897	372,772,387,749	400,564,139,493	414,030,908,974
Tech services subtotal	Subtotal	74,086,000,000	75,755,000,000	79,117,000,000	85,354,000,000	84,864,000,000
Total	Total	440,688,786,044	451,792,799,897	451,889,387,749	485,918,139,493	498,894,908,974

TRADE BALANCE (exports - imports)	Type	2014	2015	2016	2017	2018 est.
Computer / peripheral equipment	Product	(43,428,916,647)	(45,013,089,578)	(41,609,018,608)	(50,716,623,167)	(56,294,393,458)
Communications equipment	Product	(67,036,422,632)	(72,100,363,461)	(74,735,234,481)	(84,587,717,498)	(83,473,447,008)
Audio / video equipment	Product	(26,393,746,496)	(27,192,123,069)	(24,831,621,322)	(22,318,850,584)	(22,060,896,761)
Semiconductors / components	Product	(16,506,347,984)	(18,505,242,904)	(19,762,219,961)	(22,692,864,513)	(26,696,574,266)
Navigational / Measuring / Instruments	Product	(2,553,263,305)	(5,325,694,039)	(5,328,334,273)	(5,577,710,835)	(5,679,855,087)
Magnetic / Optical Media	Product	(1,563,129,494)	(3,205,616,318)	(4,572,050,389)	(6,545,635,449)	(6,609,974,931)
IT / computer services	Service	(13,294,000,000)	(11,233,000,000)	(9,905,000,000)	(9,015,000,000)	(7,949,000,000)
Information / data processing services	Service	4,699,000,000	4,802,000,000	4,816,000,000	5,780,000,000	7,201,000,000
R&D and testing services	Service	1,862,000,000	2,487,000,000	4,026,000,000	6,847,000,000	6,917,000,000
Telecommunications services	Service	6,782,000,000	6,306,000,000	6,246,000,000	5,401,000,000	4,290,000,000
Software / software-as-a-service	Service	32,463,000,000	29,996,000,000	29,115,000,000	27,124,000,000	29,473,000,000
Tech product subtotal	Subtotal	(157,481,826,558)	(171,342,129,369)	(170,838,479,034)	(192,439,402,046)	(200,815,141,511)
Tech services subtotal	Subtotal	32,512,000,000	32,358,000,000	34,298,000,000	36,137,000,000	39,932,000,000
Total	Total	(124,969,826,558)	(138,984,129,369)	(136,540,479,034)	(156,302,402,046)	(160,883,141,511)

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

CompTIA.org