

Networking and Communication Equipment

February 6, 2020

Information Technology Sector

Industry Rating

Overweight

Investment Thesis

We recommend an industry rating of overweight for the networking and communication equipment industry. The networking and communication equipment industry has been one of the fast-growing industries in the market as the industry develops various trending technological products such as intent-based network and IoT. Therefore, we recommend an overweight rating on the networking and communication equipment industry as this industry is expecting to grow at 3.4% in 2020³⁴.

Drivers of Thesis

- The adoption of cloud computing, 5G network, and AI has become an increasing trend, which fulfills the demand for processing a large amount of data and fast network speed as 5G market is expecting to increase at 42% annual growth rate and AI market is expected to reach a revenue of 118.6 billion¹³
- The strong growth trend for markets such as IoT and ethernet switch and routers market contributes to the growth of the industry as a whole. IoT market is expected to have a CAGR of 24.7%¹⁰
- 5G is expected to contribute \$2.2 trillion, 5.3% per cent of total GDP growth over the next 10 years

Risks to Thesis

- The trade war between the US and China has hurt companies in this industry with increased tariffs and banned in the sale of technology equipment to the Chinese company
- The networking and communication equipment industry is largely depending on the development of the internet. The lack of opportunity to diversify risk becomes a drawback of this industry
- The uncertainty of coronavirus disease has affected the supply chain in this industry as many companies have businesses in China

Key Industry Players

Market Value in millions

Cisco System	\$207,319
Hewlett Packard Enterp	\$19,096
Arista Networks	\$17,755
Juniper Networks	\$8,093

P/E

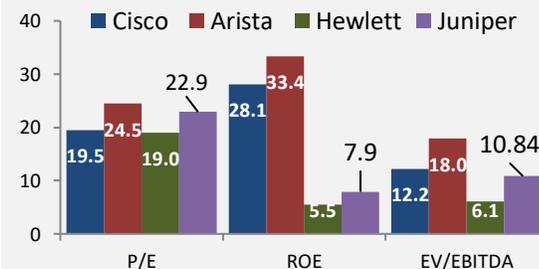
Cisco System	19.47
Hewlett Packard Enterp	19.04
Arista Networks	24.49
Juniper Networks	22.90

Five Year Beta

Cisco System	1.27
Hewlett Packard Enterp	1.51
Arista Networks	1.33
Juniper Networks	1.06

Return on Assets

Cisco System	11.1%
Hewlett Packard Enterp	2.0%
Arista Networks	24.0%
Juniper Networks	4.1%



Data Source: Factset

12 Month Performance



Industry Description

The networking and communication equipment industry produces technologies and services to support communication. Major products include infrastructure equipment, networking devices, and cloud platforms. Companies in this industry include Arista Networks, Broadcom Inc, and Juniper Network. These companies have developed various wireless products and infrastructure platforms to store data and provide communication services.

EXECUTIVE SUMMARY

The networking and communication equipment industry has remained a stable growth rate year by year. Typical companies in this industry include Cisco, Hewlett Packard Enterprise, and Arista Networks. Key markets contain ethernet switches and routers, cloud computing, and cyber security market. As the demand for fast, secure, and reliable network increases, these three markets have been projected to have a huge market share in the next 3 to 5 years, which will fuel the growth of the industry.

To capture the recent trending technological markets and concepts that have been predicted to seize the market over 3 to 5 years, companies in this industry has been developing products and services related to 5G, IoT (internet of things), AI, and intent-based network. For example, 5G is predicted to contribute to a global GDP of \$2.2 trillion over the next 10 years. Therefore, we believe that following these trending technological markets will provide sustainable revenue to this industry.

Although this industry captures the latest trends in the market, it suffers risks from the possibility of failing a research project, quick life cycle, and international markets. Companies spend a huge portion of their spending on research and development progress, and they compete by having a short product cycle. These are risks that will likely affect the performance in this industry.

Current events like trade war and coronavirus create uncertainty in this industry as many companies having businesses in China. We recommend an industry rating of overweight for this industry based on its strong projected market size and revenue growth over 3 to 5 years, but we highly recommend to keep tracking risk factors and current events that are correlated with this industry. Therefore, we recommend an overall rating of overweight on this industry.

Industry Description

The networking and communication equipment industry has been a rapid growth industry in the recent 25 years. The primary focus of companies in this industry is to develop wireless and wireline products. However, with the rapid development of the internet, the demand for storing data, protecting data, and exchanging data increase dramatically. Companies in this industry start developing technologies such as data centers, machine learning, and

cloud platforms. For example, Cisco, a leading company in this industry, has accelerated its progress in developing machine learning and cloud computing technologies. Cisco's application revenue as a percentage of product revenue has increased from 11% to 15% over the last five years.

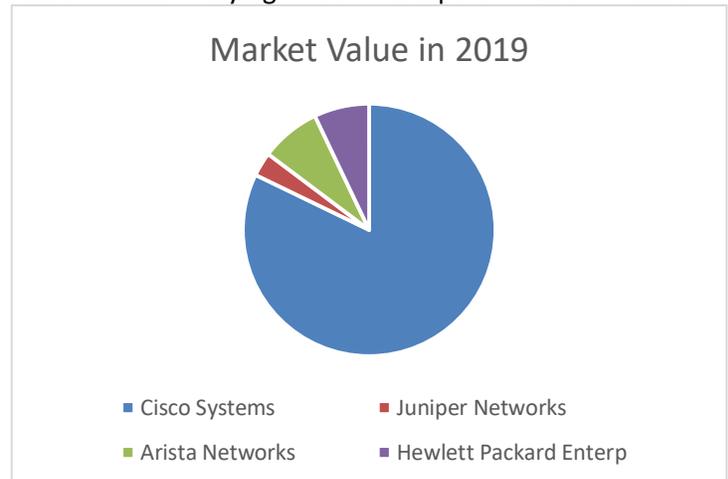
The main players in this industry include Cisco System, Arista Networks, and Juniper Networks. All these three companies are actively engaged in developing products such as switches, routers, and cloud platforms.

2019 (All figure in million)	Sales	Net Income	Net Income 3 Yr Growth	Net Margin
Cisco System	51993	10998	3.5	21.20%
Juniper Networks	4418	368	-38.7	8.30%
Arista Networks	2453	769	358	31.30%

Data Source: Factset

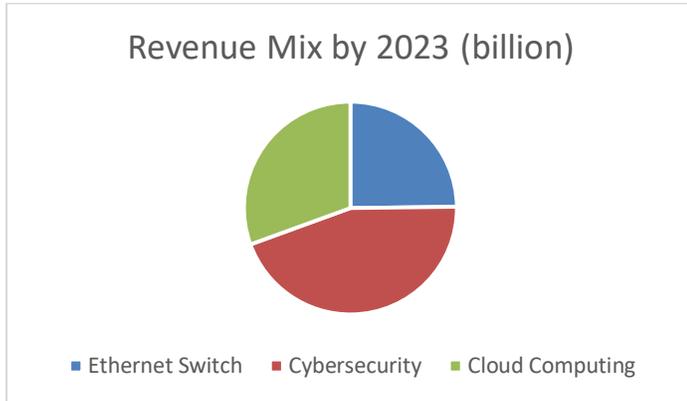
The table above compares these three companies with several metrics. Cisco System is still dominant in the industry with the most sales and net income compared to the other two. In addition, Arista Networks is growing very fast with a net margin of 31.30%, and the performance of Juniper Networks is relatively bad compared to the other two in the industry in terms of the company size.

Besides those three companies mentioned above, Hewlett Packard Enterprise is also a strong company in this industry. The graph below analyzes the market share of these four companies in 2019. It is no doubt that Cisco System is still the leading company in this industry. However, companies like Arista Networks and Hewlett Packard Enterprise are gradually increasing their market share and trying to compete with Cisco.



Data Source: Factset

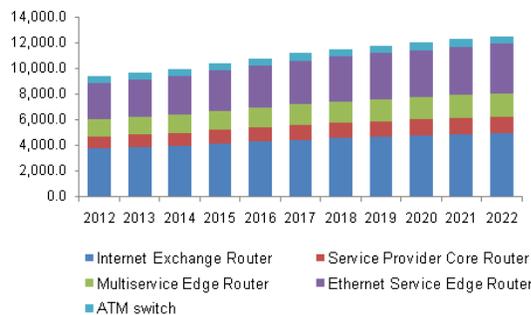
The three most important markets in this industry are ethernet switches and routers, cloud computing, and cybersecurity market. Companies in this industry have developed products and services in these three markets, and they have different strategies for operating in these markets.



Ethernet Switches and Routers

Ethernet switches and routers market is one of the biggest markets in the networking and communication equipment industry. Switches are used to connect computers in the same network while routers are used to connect multiple networks together. According to McCrea¹, increasing demand for internet-enabled devices and the expansion of cloud networking are expected to drive the ethernet switches and routers market.

Global Router and Switch Market Size

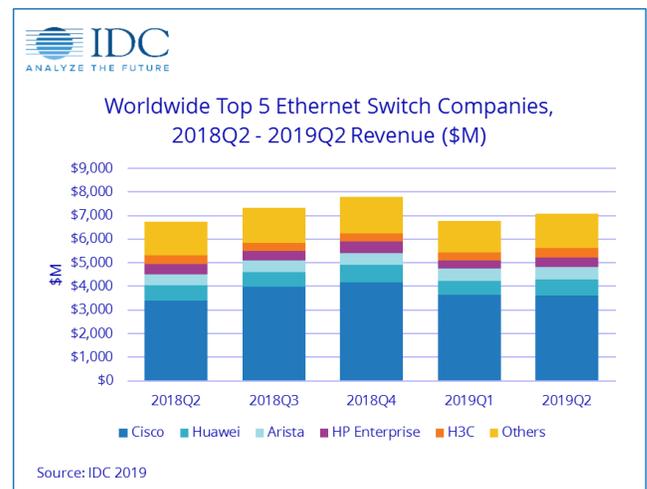


Data Source: Grand View Research

Based on the graph above provided by Grand View Research group, the global router and switches market size is expected to exceed \$41 billion by 2022, which will increase the market share of the networking and communication equipment industry.

IDC (International Data Corporation) has published a report on September 2019⁴, which points out that the ethernet switch market reached a revenue of \$7.07 billion in the Q2 2019, an increase of 4.8% year over year. In addition, the worldwide total enterprise and service provider router market revenue grew 3.4% year over year in the Q2 2019 to \$3.96 billion.

According to the IDC report⁴, the USA ethernet market grew by 10.7% while Canada's market grew 3.8%. China's market declined 4.7% year over year. Although it is supervising to see that China's ethernet market declined, most of the companies in this industry focus on the US and European market.



Data Source: IDC

The above graph shows the worldwide top 5 ethernet switch companies. One takeaway from this graph is that Cisco dominates 60% of the ethernet switch and routers market, which is a market leader in this industry. Other companies such as Arista, HP Enterprise, and H3C are increasing their weight in this market as well.

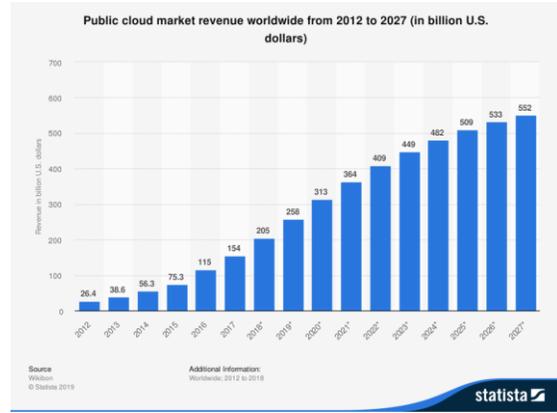
Ethernet switch and routers market is currently in the growing phase and it is expected to see that this market is going to take over a big portion of the networking and communication equipment industry as this industry is increasing of 0.1% year over year²⁰.

Cloud Computing

Cloud computing is the hottest trend in the networking and communication equipment industry in these two

years. According to Microsoft Azure⁵, cloud computing is the delivery of computing services, including servers, storage, and software to lower operating costs and run the business efficiently. Many companies such as Arista Network and Cisco in the networking and communication equipment industry have developed advanced cloud models and services and put into the market.

Cloud computing consists of two categories, which are cloud models and cloud services. Cloud models include models such as public cloud, private cloud, and hybrid cloud while cloud services include services like software as a service (SaaS) and Infrastructure as a service (IaaS).



Data Source: Statista

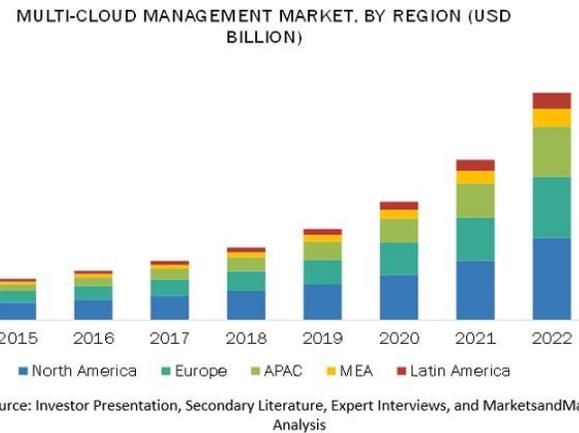
The bar chart above shows the public cloud market revenue worldwide from 2012 to 2027 (estimation). It shows that the public cloud market will reach a revenue of 552 billion in 2027. In addition, IDC (International Data Corporation)⁸ in its 2019 report states that worldwide spending on public cloud services and infrastructure will more than double over the 2019-2023 forecast period.



Data Source: Kinta

The graph above shows the cloud market growth and segment leaders in 2019. One thing to be noticed is that cloud services like software as a service (SaaS) and Infrastructure as a service (IaaS) are growing fast. Companies like Amazon, Microsoft, and Google are actively engaged in developing cloud services in recent day. The companies mentioned above such as Cisco, Arista, and Juniper are also developing cloud models and services, but their cloud businesses are still in the developing phase, which takes up a relatively small portion of the cloud computing market.

Synergy Research Group⁶ in their 2019 report points out that 91% of businesses reported using a public cloud service, 72% opting for a private cloud solution, and 69% selecting a hybrid solution. Most companies rely on public cloud services day, and it is expected to see that more companies will shift toward cloud services platforms in the next couple of years.



Data Source: Markets and Markets

The chart above analyzes the market size in the multi-cloud management market. Looking at this graph, North America will have the largest market size in this market, and it is expected to seize a huge portion of this market in 2022. Following North America, Europe is anticipated to hold the second-largest market size in the cloud market. Lastly, the market size of the cloud market in the Asia Pacific region is expected to be growing as well.

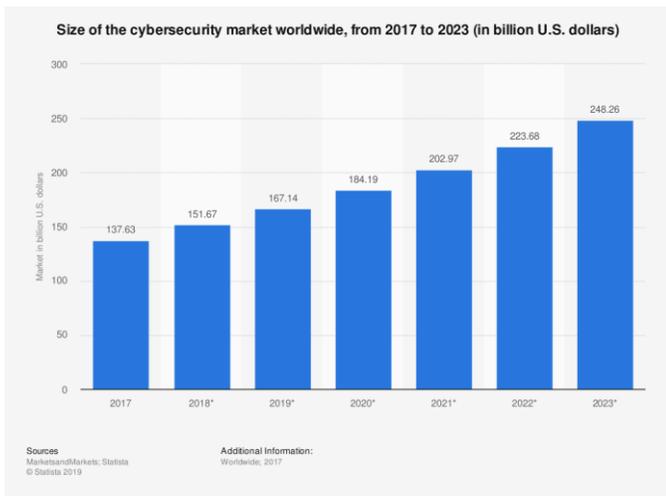
Cloud computing market is one of the fastest-growing markets in the networking and communication equipment industry, it is clear that cloud computing will be widely

used in the next three years, which will generate a significant portion of revenue to the entire industry.

Cyber Security

Cyber security becomes an important market in the networking and communication equipment industry as we move into a digitalized world where the public is concerned about data security and personal privacy. As the demand for a safety networking environment is rising, companies in the networking and communication equipment industry begin to focus on cyber security and develop related products. For example, Cisco System has increased its spending on security product lines, and its revenue from the security component as a percentage of product revenue has increased from 5% to 7% for the year 2015 to 2019. Other companies such as Arista Network, Hewlett Packard Enterprise, and Juniper Network have their own security product lines.

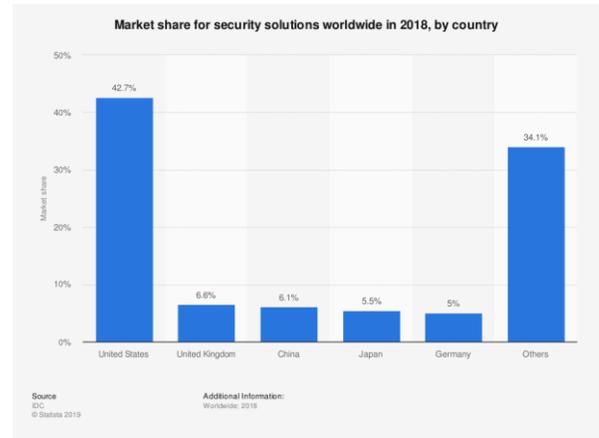
According to Cisco System¹⁰, cybersecurity is the practice of protecting systems, networks, and programs from digital attacks. Typical cybersecurity issues include Malware, Ransomware, and phishing. To fight with these cybersecurity issues, companies like Cisco and Arista have developed their own security systems, such as Arista’s Macro-Segmentation Services (MSSTM), and Cisco’s Talos technology.



Data Source: Statista

Cyber security market is one the most important today and in the next couple of years. The bar chart above which referenced from Statista tells the size of the cybersecurity market worldwide, from 2017 to 2023 (estimation). The global cybersecurity market is expected to grow to 248.26

billion from 167.14 billion in 2019, which indicates that cyber security market like other markets in this industry is going to be expanded with a huge demand in the next three years.



Data Source: Statista

Looking at cyber security market from the country’s perspective, the bar chart above shows the market share for security solutions worldwide in 2018, by country. As the graph indicates that the US enjoys the largest market share of security solutions. China and the UK are holding 6.1% and 6.6% of market share in the cyber security market.

The United States is the dominant market leader in the cyber security market, and it is projected to be a market leader in this market for the next two years. we believe that the US are experiencing more web attacks as the US has the most advanced network system in the world. Although the second-largest economy in the world, China, its market share in this market is far less than the US, many Chinese cyber security companies such as Meiya Pico, 360 Enterprise Security Group, and H3C are growing in a fast paced. Therefore, it is expected to see that the US and China will gain the largest market share in the cyber security market and generate a significant profit from it in the near future.

RECENT DEVELOPMENTS

Many companies in the networking and communication equipment industry have developed innovative products and services. Two of the recent developments in this industry are intent-based network and Internet of things (IoT). This section is going to examine these two innovative

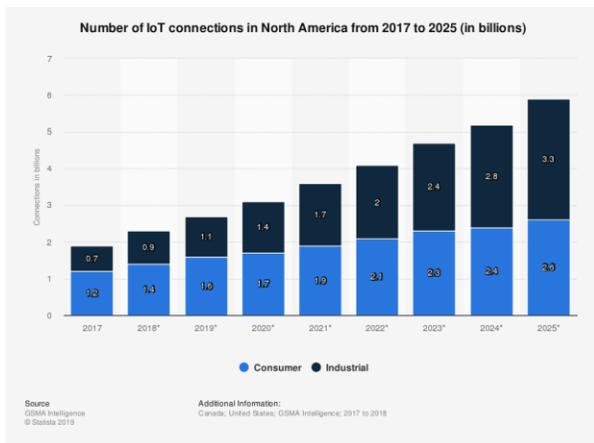
technologies in detail and project their future development.

Intent-Based Networks

Companies such as Cisco, Juniper, and Huawei in the networking and communication equipment industry have invented innovative networks, which is called intent-based network. According to Cisco¹³, IBN transforms a hardware-centric, manual network into a controller-led network that captures business intent and translates it into policies that can be automated and applied consistently across the network. The goal of Intent-based network is to integrate IT flows, detect security issues quicker, and perform analytics by using machine learning tools.

Two typical companies that have achieved great progress on intent-based networks are Cisco System and Juniper Network. Both of these two companies have incorporated machine learning algorithms to optimize network operations. In addition to companies in the US, Chinese company Huawei has introduced its intent-based network in 2018, which helps Huawei build a future-proof wireless network.

In terms of the impact on the industry, the Intent-based network will bring 25% of market share to IT and telecom sector by 2025, and the intent-based network is expected to reach a market value of \$4 billion by 2025 based on a report published by Market Watch¹⁴. According to Global Market Insights¹⁵, the growing demand for reducing network downtime, avoiding errors in network configuration, and reducing network infrastructure delivery time are driving the market growth of intent-based network market.

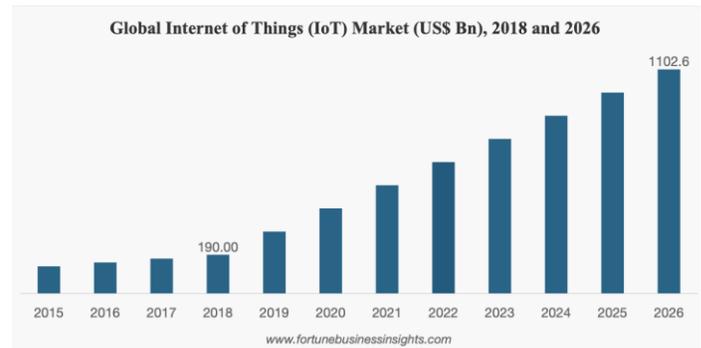


Data Source: Statista

The graph above shows the number of intent-based network connections of consumers and industrials in North America from 2017 to 2025(estimation), the trend shows that there will be more people connected to intent-based network. In 2025, Statista predicts that there will be 2.6 billion consumers connected to the intent-based network, which is a huge number compared to where we are now. The increasing popularity of the intent-based network will be beneficial for the IT industry as well as the companies developing the intent-based network.

Internet of Thing (IoT)

According to Morgan from Forbes¹⁷, Internet of thing refers to connect any devices with an on and off switch to the internet. Devices can be anything such as cellphones, washing machines, and so on. Some top companies engage in internet of thing include Cisco and Google.



Data Source: Fortune Business Insights

More and more businesses are using digital technologies like internet of thing to transform their businesses. According to the IMD and Cisco Digital Vortex 2019 report¹⁹, 88% of executives believe that digital disruption will have a major or transformative impact on their industries, compared with only 27% in 2015, which shows that the demand for internet of thing is high.

The above graph shows the global internet of thing market from the year 2015 to 2026 (estimation). Based on the graph, the market size of internet of thing will increase dramatically from 190 billion in 2018 to 1102 billion in 2026, and the market will expand at a CAGR of 24.7% throughout the forecast years.

Internet of thing will become a main trend in the next two years because of the explosion of IoT devices, apps, and most importantly, machine-to-machine (M2M) devices. According to Cisco 2020 global networking trend report²⁰,

machine-to machine (M2M) devices will account for 51% (14.6 billion) of all networked devices in the year 2022. We can see that the company in this industry like Cisco has accelerated its development of the complementary architecture, network function virtualization (NFV), which will be used to manage IoT devices. Therefore, it is anticipated to see that Internet of thing market will be one of the fastest developed markets in this industry.

INDUSTRY TRENDS

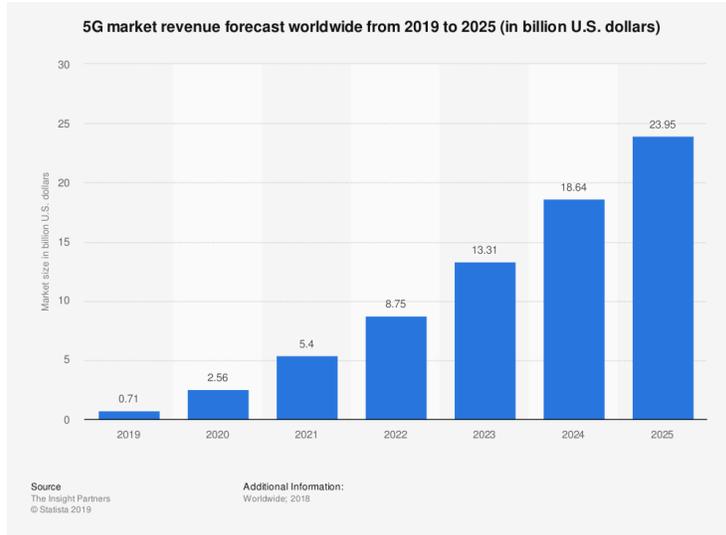
According to the Cisco 2020 global networking trend report²⁰, there will be 48.9 billion connected devices in use around the world by 2023, and the 2018 Cisco Complete VNI Forecast predicts that the average amount of data consumed will be almost 60 GB per personal computer per month. As a result, we need innovative technologies to drive network evolution. In this section, two industry trends will be discussed, which are mobility (5G & Wi-Fi 6) and AI.

Mobility (5G & Wi-Fi 6)

People are now relying on mobile applications and owning a mobile device has become a necessity. The development of mobile devices has changed our lifestyle. As we move into a more advanced mobile lifestyle, we want our mobile experience to be personalized, fast, and always connected. That is when 5G and Wi-Fi 6 become a trend in the networking and communication equipment industry. Wi-Fi 6 is the next generation standard in WiFi technology.

In addition, to enhance mobile experience, the newly added business innovations should also be taken into considerations, which include AR, VR, and high-definition video. These business innovations require a higher performance connectivity network.

According to the Cisco report²⁰, Wi-Fi 6 and public mobile 5G networks both promise dramatically better performance to support such requirements since Wi-Fi 6 brings higher data rates, lower latency, increased device density. On the other hand, public mobile 5G networks will offer speeds over four times faster than those experienced on 4G, and 5G will offload over 70% of its traffic, up from the 59% that 4G networks offload.

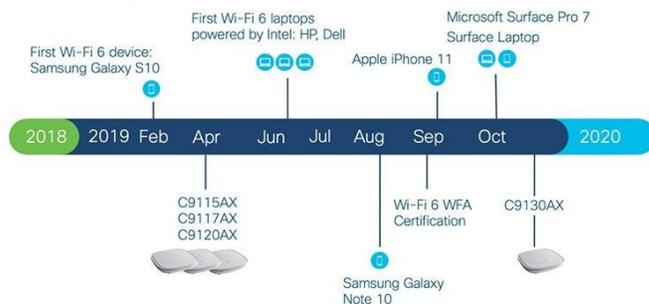


Data Source: Statista

The chart above predicts that 5G market revenue will reach 23.95 billion from the year 2019. In addition, according to the Cisco “VNI Forecast Highlights Tool,” global business mobile data traffic will grow at an annual growth rate of 42% from 2017 to 2022. Therefore, the 5G market will be growing to be the biggest networking market in the next five years.

Like the 5G market, Wi-Fi 6 market is growing, and many companies have adopted Wi-Fi 6 technologies into their product lines. The chart below provided by Cisco System²² summarizes the Wi-Fi 6 adoption process. Samsung has made its first step in adopting Wi-Fi 6, followed by Dell, Intel, and HP. What we predict is that there will be more companies developing and adopting Wi-Fi 6 technologies into their product lines as the demand for fast and reliable networks increases.

Wi-Fi 6 adoption began in 2019 and it is accelerating



Data Source: Cisco

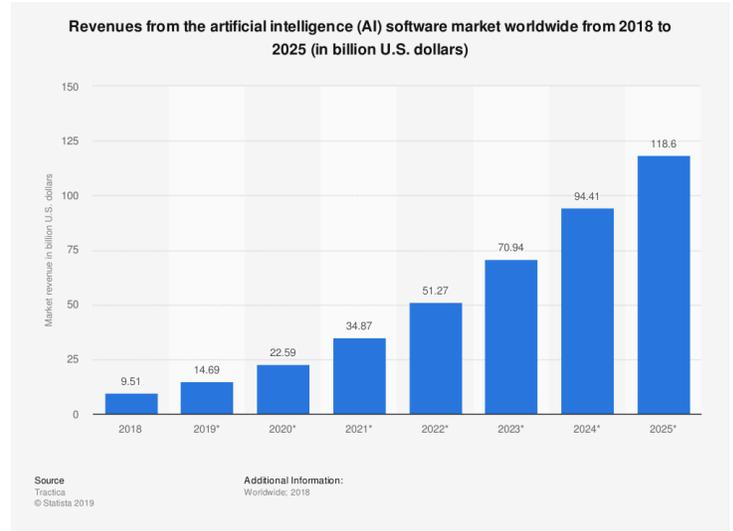
Artificial Intelligent (AI)

Artificial Intelligent (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions according to Jake from Investopedia²³. Areas that artificial intelligent cover includes machine learning, neural networks, and deep learning. Companies that are currently developing AI technology include Microsoft Corporation, Google, Facebook, and IBM.

As the development of cloud computing and Intent-based network accelerate, AI has helped analyze the complexity of the networking environment. According to Cisco 2020 global networking trend report²⁰, networks are generating massive amounts of data that exceed the ability of human operators alone to manage. However, AI can analyze massive amounts of data in a short time frame, which can help businesses create a better baseline and predict unexpected problems in a network.

Some key findings presented in Cisco’s report²⁰ states that (1) Over 50% of network strategists identify AI as a priority network investment. (2) 72% of network strategists project using AI-enabled predictive insights or prescriptive remediation within the next two years, and (3) Only 17% of network strategists believe a lack of maturity in AI technologies poses an obstacle to network modernization. All these findings lead us to the conclusion that the power of the AI market cannot be neglected. The chart below shows the revenue from the AI software market from 2018 to 2025 (estimation). As the upward trend shows that the AI market will be one of the fastest-growing markets worldwide, and the AI software market is expected to see revenue of 118.6 billion.

We believe that AI will be the new dominant technology in this industry, not only because the amount of data that needed to be analyzed is massive, but also because AI technology is crucial in the development of Intent-based network, IoT, and cloud computing.



Data Source: Statista

Industry and Competition

The Networking and communication equipment industry is a broad industry that consists of companies specialized in different fields that include technology, cable production, network equipment, and so on. Therefore, we are going to examine this industry by analyzing risks, competitions, and structure of this industry in this section.

Industry History

The word “network” did not exist until the telephone was invented by Alexander Graham Bell in 1876. The telephone is the first thing that connects the world together, which forms a unified network. As the demand for the telephone grew up, communication equipment industry was formed by companies that specialized in producing telephone cables and telephones, one of the biggest companies in the communication equipment industry was AT&T.

As the internet appeared, the definition of the network changed from physical network to the internet network. The communication equipment market shifted from producing the telephone cable to internet equipment. For example, Cisco System was the first company that sells multiple network protocols routers.

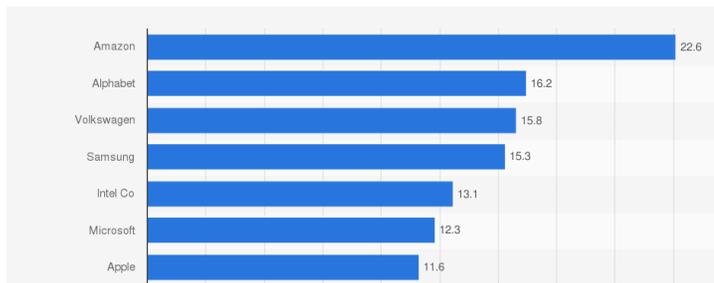
Nowadays, as more advanced internet-related product such as cloud platforms and 5G networks get developed, there are more companies joining the networking and communication equipment industry, and this industry is expanding at an unprecedented speed. We are expected

to see this industry taking over a big portion of the market in the future.

Life Cycle

The networking and communication equipment industry is facing rapid technological developments, evolving standards, changes in customer requirements, and new product introductions and enhancements²⁷. In order for companies in this industry to survive, they need to develop new products and improve existing products that meet customers' expectations. Therefore, companies need to invest significantly in resources to conduct research and development efforts, which cases a high research and development expense.

Seven Highest R&D Expense Companies



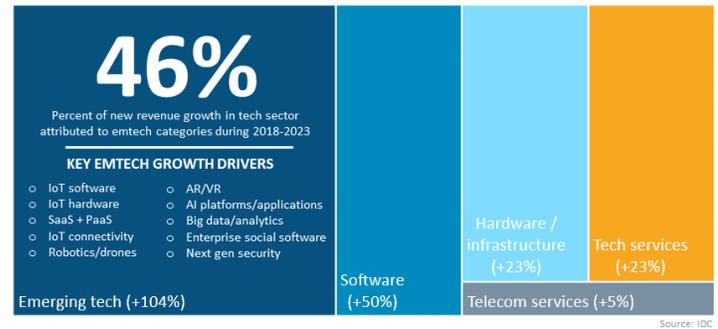
Data Source: Statista

Above graph shows the top seven highest research and development expense as % of sales companies in the US, what we notice is that most of the companies like Amazon, Google, and Samsung are in the networking and communication equipment industry, which proves that research and development is one of the heavily invested fields for companies in this industry.

According to CompTIA IT industry outlook 2020²⁸, although emerging tech market that includes technologies like AI and IoT currently account for only 17% of the overall global revenue, they are expected to drive nearly half of the growth in new revenue. Based on the graph below, the emerging tech market is expecting to be growing at a growth rate of 46% from the year 2018 to 2023, which is a huge portion of revenue growth compared to the other tech markets.

Emerging Tech Categories Drive Revenue Growth

Estimated contribution of new global tech spending during the 2018-2023 time period



Data Source: CompTIA

Industry Risks

- Companies in the networking and communication equipment industry are facing intensive competition from the competitors. Rapid technological innovation will likely change a company dominant position in the industry. In addition, following customers' needs and industry trends are crucial for companies since companies in this industry are largely depending on products and services based on customers' needs. If failed to follow, companies might suffer a huge impact on market share.
- Many companies in this industry are expanding globally, which means that companies need to suffer the risk of competing with local companies that are in the same industry. For example, Cisco System has operation branches in China, and Cisco System is experiencing price-focused competition from competitors in China. On the other hand, companies are exposed to exchange rate risk, which could potentially impact companies' financials and daily operations.
- In addition, companies in this industry doing business globally will suffer the risk coming from the instability of the global macroeconomic environment and local governments. For instance, many companies in this industry doing business in the UK have suffered the impact of UK withdrawal from the European Union.
- Companies in the networking and communication equipment industry are fully dependent on the growth of the internet. Without a strong internet growth, companies will suffer huge revenue losses

due to its difficulties in diversified risks. Meanwhile, for companies operating in this industry, if they ran into technological bottlenecks, it would hurt their businesses and financials as well.

Peer Comparisons

This section is going to compare several companies in the networking and communication equipment industry by looking at current ratio, gross margin, research & development expenses, sales, and EPS.

Companies that we choose to do a comparison with include Cisco System, Juniper Networks, Hewlett Packard Enterprise, Broadcom, and Arista Networks. These companies are operating in the same fields such as ethernet switch and routers market, cloud-based services, and software market. The chart below summarizes the comparison results for the year 2019.

Company				
2019	Current Ratio	Gross Margin	RD Expense	Sales
Cisco System	1.81	64.5%	6648	51556
Juniper Networks	2.08	58.9%	955	4445
Hewlett Packard Enterprise	0.79	31.5%	1861	28351
Broadcom	1.56	46.5%	4852	22666
Arista Network	5.81	64.1%	462	2410

Data Source: Factset

The current ratio is a liquidity ratio that measures how well the company can cover its current liabilities by using its current assets. The company Cisco has a current ratio greater than one, which indicates that Cisco has the assets to cover its liability efficiently. However, Cisco's accounts receivables are relatively high compared to the other four companies, which indicates that its customers are paying slowly.

For the company Hewlett Packard Enterprise, it has a current ratio of 0.79 less than one, and it signals that this company is not able to cover its liabilities efficiently. Looking at its financial statement, what we found is that this company had too many accounts payable in 2019, which caused its current liability to go up. In addition, its inventory level is high compared to the other four

technology companies, which indicates that it might have a low inventory turnover ratio.

One interesting case regarding current ratio is Arista Networks company. They have a current ratio of 5.91, which is the highest compared to the other four companies. Looking at its financial statement, we found that this company has invested heavily in marketable securities in 2019, and that produces a higher current asset.

In terms of the gross margin, Broadcom has the highest gross margin among the other four companies. However, Hewlett Packard Enterprise has a gross margin of much less than the average of the other four companies. What we conclude is that Hewlett Packard Enterprise is underperformed in this industry in terms of the ability to generate revenue. Cisco has a gross margin of 65%, which is relatively stable compared to its last two years' performance. Arista Network, as one of the fast-growing companies in this industry, has a gross margin of 64.5% last year, which is closed to Cisco's gross margin.

Look at these five companies research and development expense in 2019, Cisco has the most research and development expense as % of sales while Arista Networks spent less on research and development. Besides Arista Networks and Cisco, Broadcom has increased its spending on research and development. One trend we found is that all these five companies have increased their spending on research and development regardless of how much they spent on research and development.

One of the important metrics, when evaluate companies in this industry, is looking at their sales. According to the sales numbers, Cisco is still the dominant force in this industry with sales of 51993 million. Although Juniper Networks and Arista Networks has a small market size compared to Cisco, their revenues generated from products and services increase year by year.

In conclusion, Cisco is still the leading company in this industry, and its performance is stable with an optimistic sale and gross margin number. Arista Networks and Broadcom inc are the two fastest-growing companies in this industry. Both companies are currently in the growing phase, and they are gradually generating revenues from their products and services. Although Juniper Networks' performance is not as good as Arista Networks and Broadcom, it is still a fast-growing company specialized in

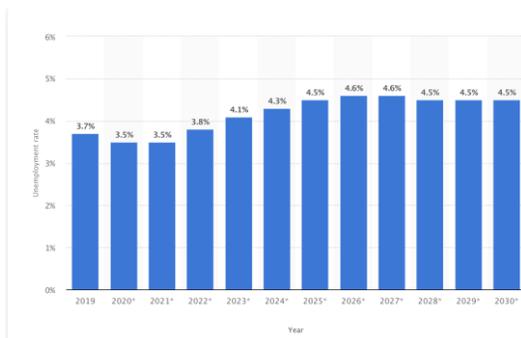
cloud computing and services. Finally, as one of the mature companies in the industry, the performance of Hewlett Packard Enterprise has slowed down in 2019, but it still has a large amount of cash and resources to develop innovative products and services to customers.

ECONOMIC OUTLOOK

Macroeconomic factors are key to predict the performance of an industry. In this section, we are going to discuss the impact of current economic conditions and macroeconomic factors on the networking and communication equipment industry.

Unemployment

Unemployment Rate in the US from 2019 to 2030

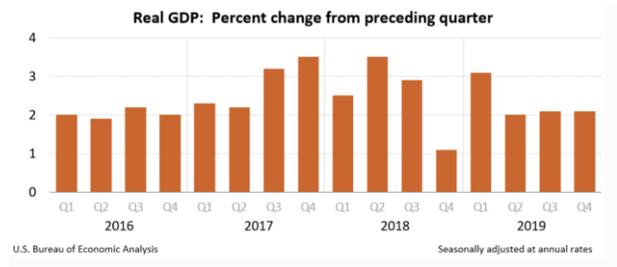


Data Source: Statista

The chart above shows the unemployment rate trend in the US from the year 2019 to 2030 (estimation). The current unemployment rate in 2020 is 3.6%, which is considered a very low unemployment rate, which will stimulate people’s spending and income. We believe that the networking and communication equipment industry will see market growth in the short term as more spending will go to this industry.

However, the unemployment rate is showing an upward trend in the graph from the year 2021 to 2030, which we believe that increase in unemployment rate will likely slow down the growth of this industry in the long run.

Real GDP



Data Source: US Bureau

The chart above shows the real GDP growth by years. According to the US Bureau of Economic Analysis, real GDP increased by 2.1 percent in the fourth quarter of 2019. Compared to the past real GDP growth rate, it is a relatively stable growth rate. What we predict is that the US real GDP growth rate will lie on a range of 2.0 to 2.3 percent. In the short term, we believe that a stable read GDP growth rate will provide a stable investment environment for the networking and communication equipment industry.

Trade War

One of the economic issues that we are currently facing is the trade war between the US and China. Many companies in this industry have operating branches in China, and they suffered some impacts from the trade war.

The US banned on selling to Huawei has created sales loss to companies in this industry. According to Richard from financial times³⁰, Broadcom, for instance, derives more than 5% of its total sales from Huawei. The uncertainty from the trade war caused Broadcom to lower its prediction of revenue in 2019.

On the other hand, the trade war has increased the tariffs on imports into the US. According to Richard³⁰, companies like Cisco suffered the impact of increased tariffs. “For suppliers of data center technology such as Cisco, a recent increase in import tariffs to 25 per cent has already started to bite.” Therefore, we believe that the trade war between the US and China will create impact to Cisco.

Coronavirus

The outbreak coronavirus in Wuhan, China has created a huge impact globally. Unsurprisingly, coronavirus has affected companies that have businesses in China in this

industry, especially their supply chain. According to Riley from Silicon Angle³², the world's largest provider of manufacturing services Foxconn, manufacturing products for Cisco, Hewlett Packard Enterprise, Huawei, has not been in production since the beginning of the Chinese New Year.

The impact of this issue would be small if the coronavirus did not last long. However, the situation of coronavirus is getting worse not only in China but also in other countries. "What we are worried about is delays for another week or even another month, the impact would be big," said Riley³². Therefore, we believe that the impact of coronavirus to companies in this industry now is small. However, if the situation of coronavirus couldn't be under control by the Chinese government within two months, the impact would be huge to the networking and communication equipment industry.

INVESTMENT POSITIVES

The networking and communication equipment industry is one of the fastest-growing industry in the market because many technology fields that this industry covers will eventually take over the market, which includes 5G, AI, cloud computing, and IoT (Internet of thing). In addition, these technologies are widely used in other fast-growing industries like healthcare and transportation, which will fuel the growth of the networking and communication equipment industry.

INVESTMENT NEGATIVES

Many companies in the networking and communication equipment industry have businesses outside of the US market. Although the US market is taking up a big portion of their market revenue, companies in this industry are still suffering the risk of unstable foreign investment environment and competitions from local companies. On the other hand, the current events which include trade war with China and coronavirus will hurt the industry growth and slow down the revenue growth of individual companies.

KEYS TO MONITOR

With this industry is largely depending on rapid technological developments, evolving standards, changes in customer requirements, and new product introductions and enhancements. We recommend keeping tracking the

recent products and services developed by companies in the networking and communication equipment industry to determine the industry's performance. In addition, companies in this industry spend significantly on the research and development process, so keep tracking of companies' product development processes is crucial as well.

The performance of this industry is largely depended on the development of the internet. As a result, we recommend monitoring the factors that could change the development of the internet, such as newly developed internet-related products, government internet regulations, and internet usage trends.

Trade war and coronavirus are economic events that will impact the networking and communication equipment industry currently. We recommend investors monitoring the latest news regarding these two events, which helps track the performance of the industry.

Lastly, it is important to monitor macroeconomic factors such as Real GDP, unemployment rate, inflation, and Fed interest rate since these key macroeconomic factors will not only affect the economy as a whole but also individual industries in the market.

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