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Equity Research
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CREDIT SUISSE

Comm. Equipment & Infrastructure

CIO Survey – Data Center Implications Positive, Networking Impact Neutral

Telecommunications Equipment | Channel Check

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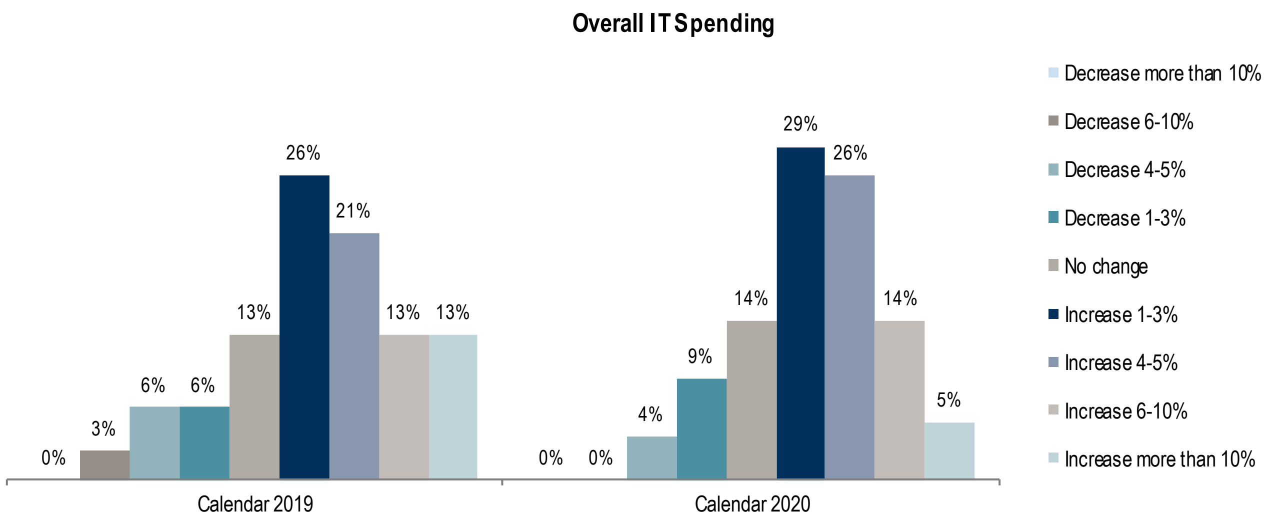
We surveyed 80 Global CIOs at companies with over $1bn in revenue to understand their spending intentions for IT. The results suggest a slight deceleration in IT budget growth to +3.1% in 2020 from +3.4% spend in 2019. The full survey findings and cross-sector takeaways and data can be found in the full report "*Credit Suisse CIO Survey: TMT 2020 Spending Outlook.*" Our CIO survey findings align with our thesis for both of our coverage sectors outlined in our *2020 Outlook – The Cloud Has Four Walls.* As it pertains to networking equipment and data centers, we make the following key points:

- **Networking Equipment:** Networking spend growth consistent in 2020 vs. prior year. Based on CIO responses, networking spend is projected to be +1.0% y/y, with no deceleration in 2020, given that 2018 spending was +1.2% y/y, 2019 at +1.0% y/y, and +1.0% y/y level projected by CIOs in 2020. Into 2020, 75% of CIOs selected CSCO (Neutral, $46 target price) as a spending wallet share gainer that compares to 78% last year, reflecting a small downtick. Of note, JNPR (Underperform, $19 target price) had 14% of CIOs planning spending share increases versus 12% last year, incrementally better than ANET (Neutral, $153 target price) at 4% versus 4% last year, driven by their recent Mist Systems acquisition and channel/salesforce investments, in our view. In campus switching and WLAN, 84% of responders selected CSCO as their main vendor of choice, an uptick versus 79% in 2019, a notable positive for CSCO given the intensified market competition by JNPR, ANET, COMM, EXTR, UI, HPE, and others across various equipment types. Altogether the survey indicates better market positioning and performance for CSCO on a relative basis compared to JNPR, ANET, and others, given spending share gain, campus switching/WLAN preferences of CIOs, and newly introduced products in switching within CSCO's robust sales channel compared to peers.
- **Data Centers:** 76% of CIOs either will be deploying into colocation/wholesale data centers (33% of respondents) or are still considering their deployment strategy (43%), highlighting the room for growth that multi-tenant data centers (MTDCs) have, as the plurality of respondents are still assessing IT deployment strategy. Over half of CIOs expect to shutdown enterprise-owned data centers going forward, another supportive indicator for the growth of the MTDC industry. That said, only 36% expect to grow their colocation footprints in 2020 y/y, emphasizing our view that there will be clear winners and losers in 2020. A key factor driving those winners and losers will be interconnection, in our view. Over half of respondents (55%) noted the increasing importance of interconnection services at colocation data centers, supporting up our view and aligning with our 2020 thesis around data center adoption, highlighted in our 2020 Outlook. We view that data centers like EQIX (Outperform, $624 target price) and SWCH (Outperform, $19 target price) will benefit from sector driven factor, given both companies have built highly connected ecosystems that offer key advantages to their customers versus other data centers. Interestingly, 61% of CIOs noted that they do not use multiple colocation providers in their strategy, which we found surprising, showing how one vendor can be the sole provider of colo. Infrastructure for certain customers. Therefore, we believe that providers with proven track records of value creation stand to benefit in the long-run.

In 2019, almost three quarters (73%) of respondents saw positive spending growth. The respondents had a similar outlook for 2020, with 74% expecting positive spending growth, most of which (55%) is clustered in the ranges of 1-3% and 4-5% growth.

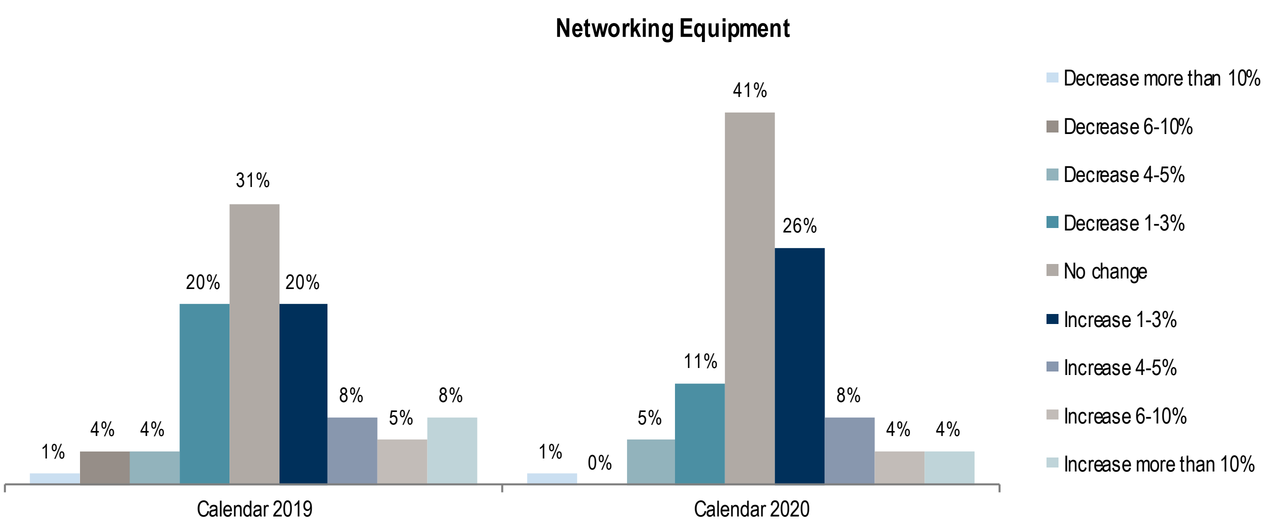
Figure 1: Overall IT - What was your company's spending growth in 2019? What is it expected to be for 2020?



Source: Credit Suisse Equity Research

As for Networking Equipment companies specifically, only 42% of respondents expect positive spending growth in 2020, in-line with our view of sluggish spending for the year. That said, a plurality of respondents (41%) expect flat growth for 2020.

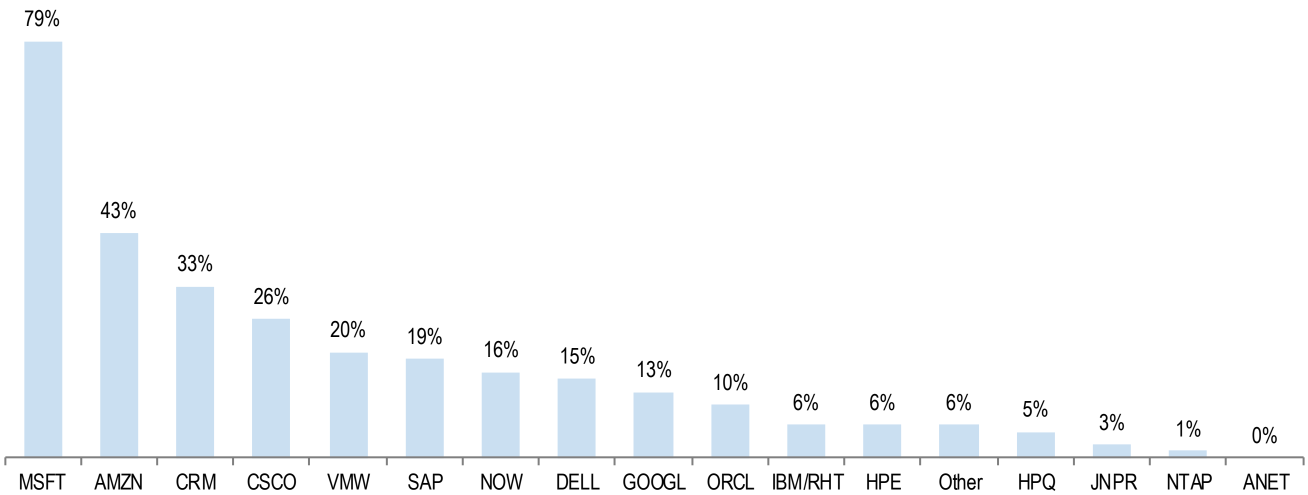
Figure 2: Networking Equipment - What was your company's spending growth in 2019? What is it expected to be for 2020?



Source: Credit Suisse Equity Research

Figure 3 highlights vendors that are expected to see the largest increase in IT spend in 2020. Companies from our Communications Equipment and Infrastructure coverage that appeared on the list include: CSCO (26%) and JNPR (3%).

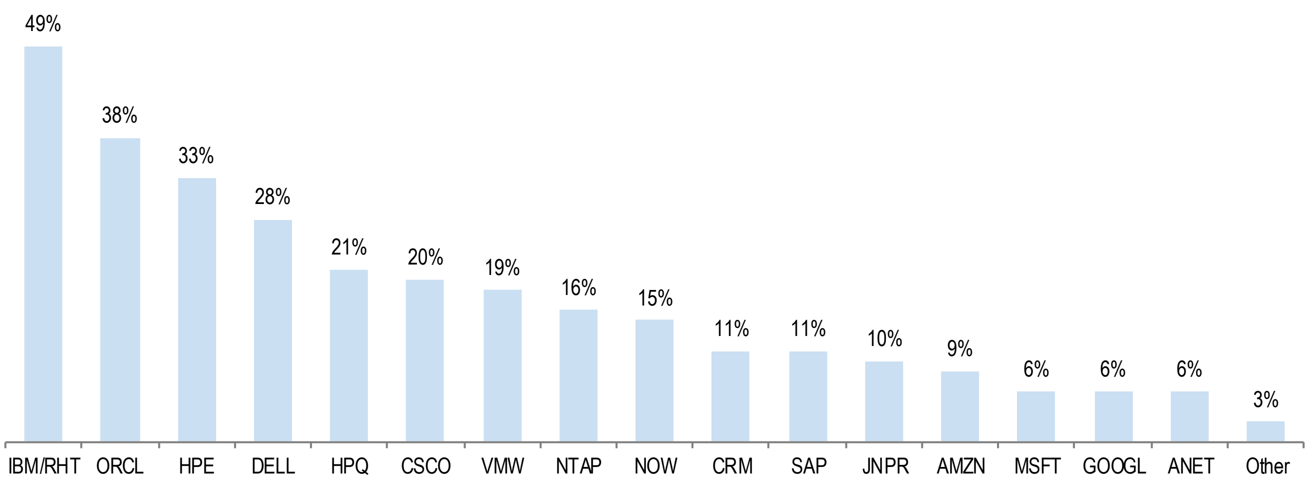
Figure 3: In your opinion, which 3 vendors will see the largest percentage increase in IT spend in calendar 2020 vs. calendar 2019?



Source: Credit Suisse Equity Research

Figure 4 highlights vendors that are expected to see the largest decrease in IT spend in 2020. Companies from our Communications Equipment and Infrastructure coverage that appeared on the list include: CSCO (20%), JNPR (10%), and ANET (6%). This shows a clear disparity in respondents' outlook for CSCO in 2020.

Figure 4: In your opinion, which 3 vendors will see the largest percentage decrease in IT spend in calendar 2020 vs. calendar 2019?

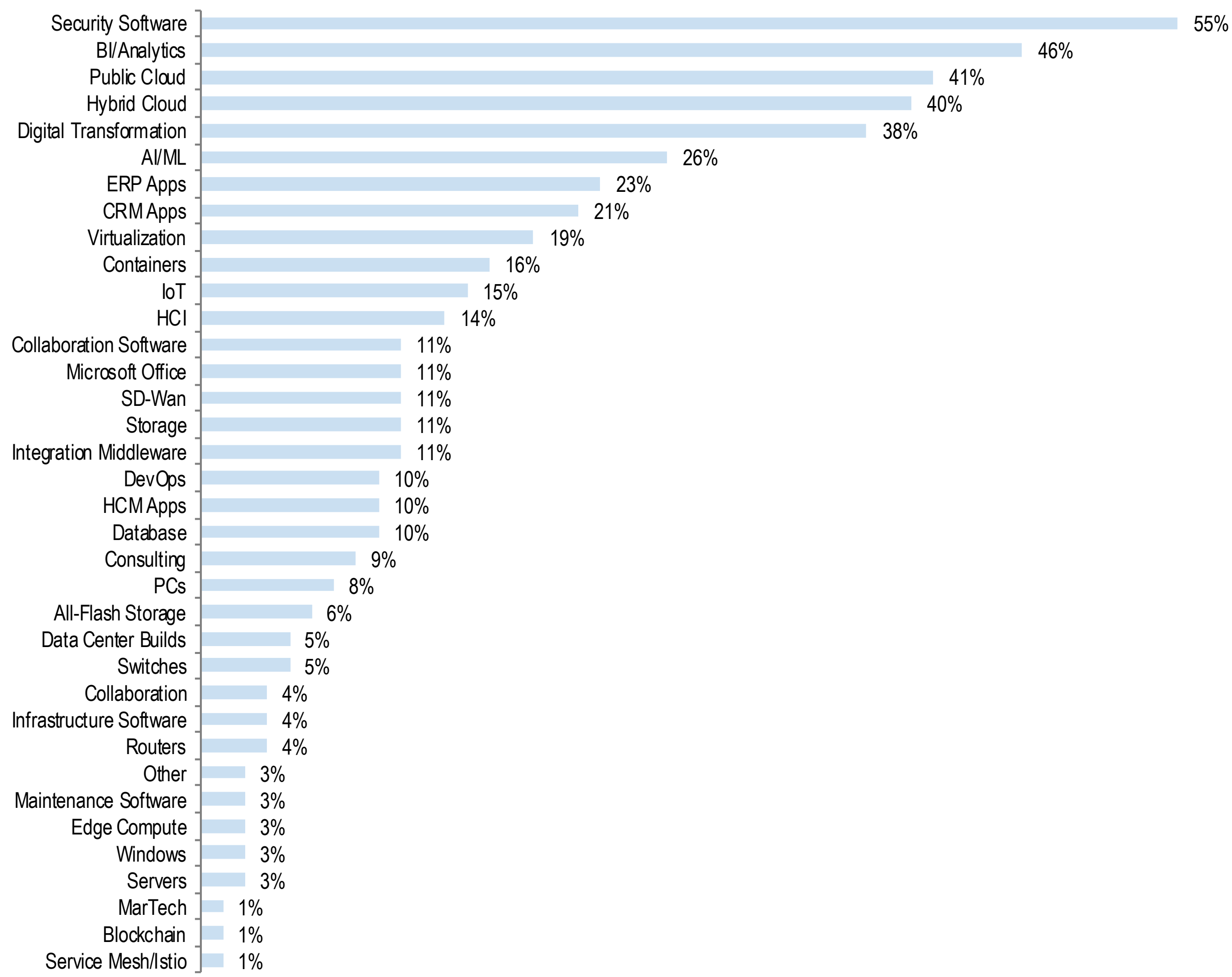


Source: Credit Suisse Equity Research

Priorities

Figure 5 underscores the continued importance of public/hybrid cloud into 2020, with ~40% of respondents naming the categories as a top-five priority for 2020. That said, the most important priority for 2020 will be security software, a positive for FFIV and its recent acquisition of Shape Security, which will accelerate FFIV's transition to a software-based company. Towards the bottom of the priority list are Switches (5%) and Routers (4%), which is another data point highlighting our tempered outlook for networking equipment companies in 2020, namely JNPR and ANET.

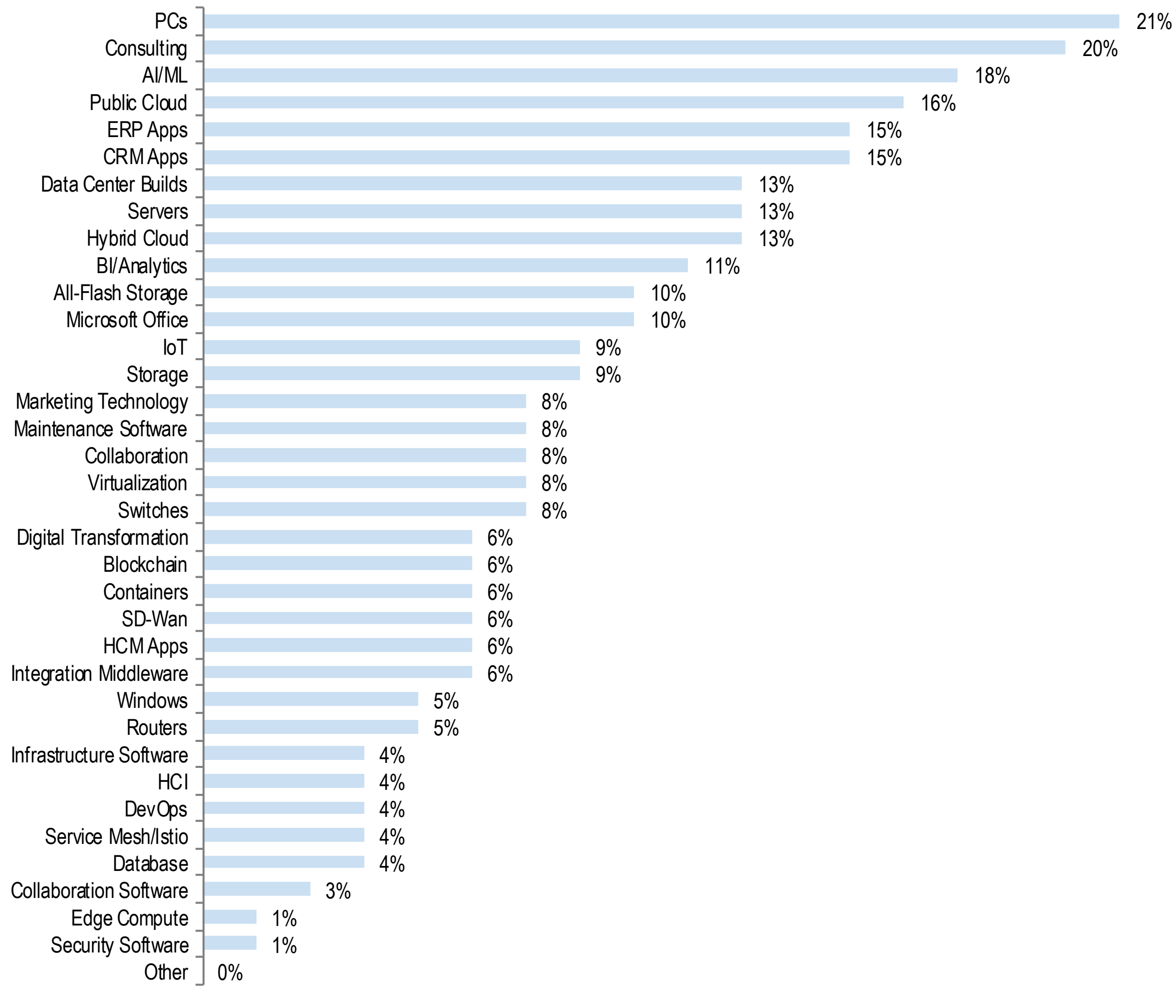
Figure 5: What are the top five areas you are prioritizing in 2020?



Source: Credit Suisse Equity Research

In Figure 6, we emphasize that in the case of an economic downturn, Public Cloud spending would likely see a greater pullback than Hybrid, given its higher average cost. Meanwhile, Figure 7 suggests that Switches and Routers would likely see a smaller pullback than other areas, which we believe is a byproduct of the already lower base for Switches and Router spending in 2020.

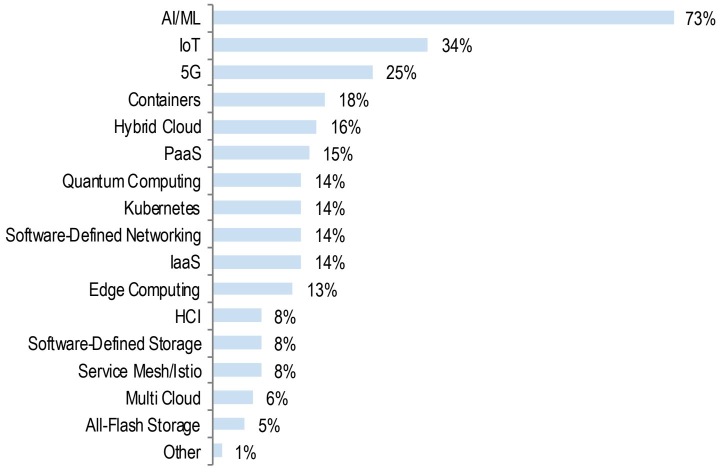
Figure 6: If the economy turns for the worse and IT budgets get cut, what are the top 3 areas where you would likely pullback spend?



Source: Credit Suisse Equity Research

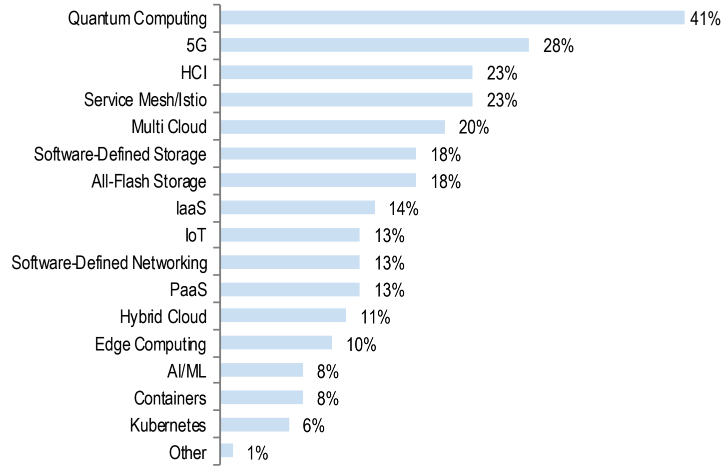
Figures 7 and 8 show that the Hybrid Cloud has few doubters, as 16% of respondents view it to be a disruptive technology over the next 3-5 years, while only 11% find it to be overrated technology. Meanwhile, 5G remains a polarizing technology with 25% viewing it as disruptive and an even greater share (28%) viewing it as overrated in the next 3-5 years. AI/Machine Learning (ML) is an overwhelming favorite to be a disruptor over the half decade. We note that while IaaS and Edge Computing were not leaders as picks to be disruptors (14% & 13%), the technologies are also proven to have many current real-world applications and therefore were not highly chosen as overrated technologies (14% & 10%) either.

Figure 7: Which of the following do you find to be a disruptive technology over the next 3-5 years?



Source: Credit Suisse Equity Research

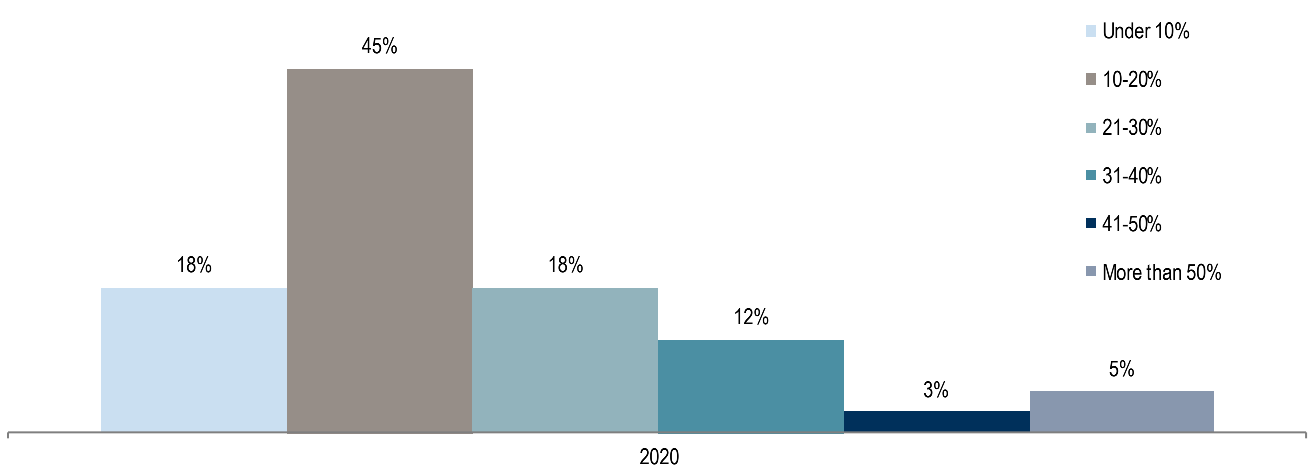
Figure 8: Which of the following do you find to be the most overrated technology over the next 3-5 years?



Source: Credit Suisse Equity Research

Over 80% of respondents expect 30% of spending or less to be tied to Digital Transformation initiatives in 2020.

Figure 9: What percentage of your company's total IT investment in 2020 is directly tied to Digital Transformation initiatives?

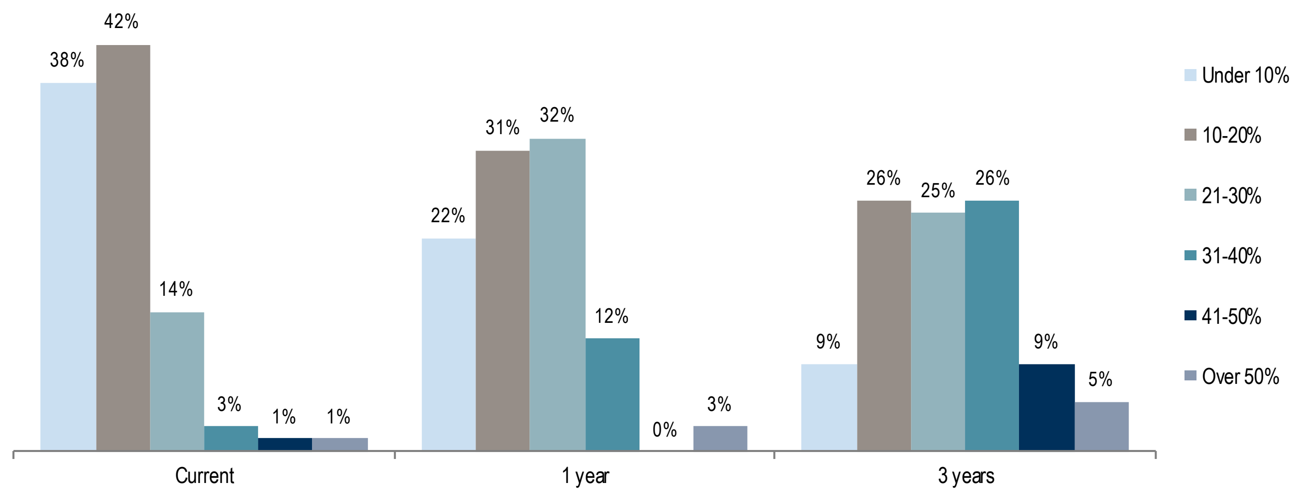


Source: Credit Suisse Equity Research

Public Cloud

Figure 10 highlights that many CIOs expect to spend an increasing percentage of their IT budget on public cloud over the next three years, with ~40% spending over 30% of their budget by 2022.

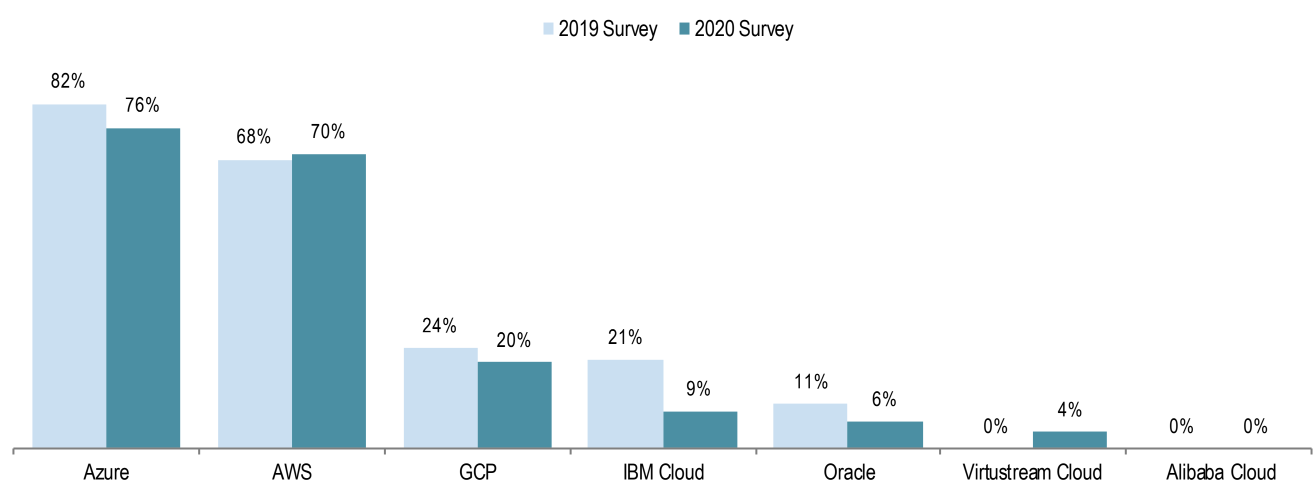
Figure 10: What percent of your IT budget do you currently spend on public cloud (SaaS/IaaS/PaaS)? How do you expect it to change over the next year and 3 years?



Source: Credit Suisse Equity Research

Azure and AWS remain head and shoulders above the public cloud competition, with over 70% of respondents choosing Azure (76%) as a preferred choice, followed closely by AWS (70%). GCP continues to hold a clear third place, receiving 20% as a preferred choice.

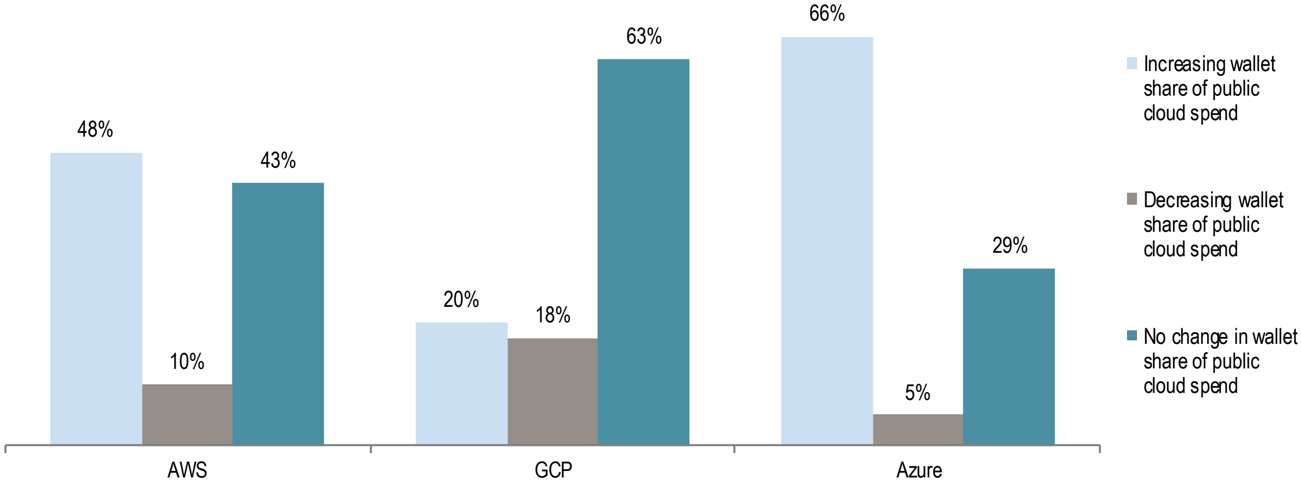
Figure 11: Which of the following is/are your preferred IaaS / PaaS cloud vendor(s) of choice?



Source: Credit Suisse Equity Research

Figure 12 highlights the growing positivity around Azure, with 66% of respondents noting increasing wallet share versus 5% for decreasing wallet share. AWS showed slightly less positive results, 48% increasing wallet share versus 10% decreasing.

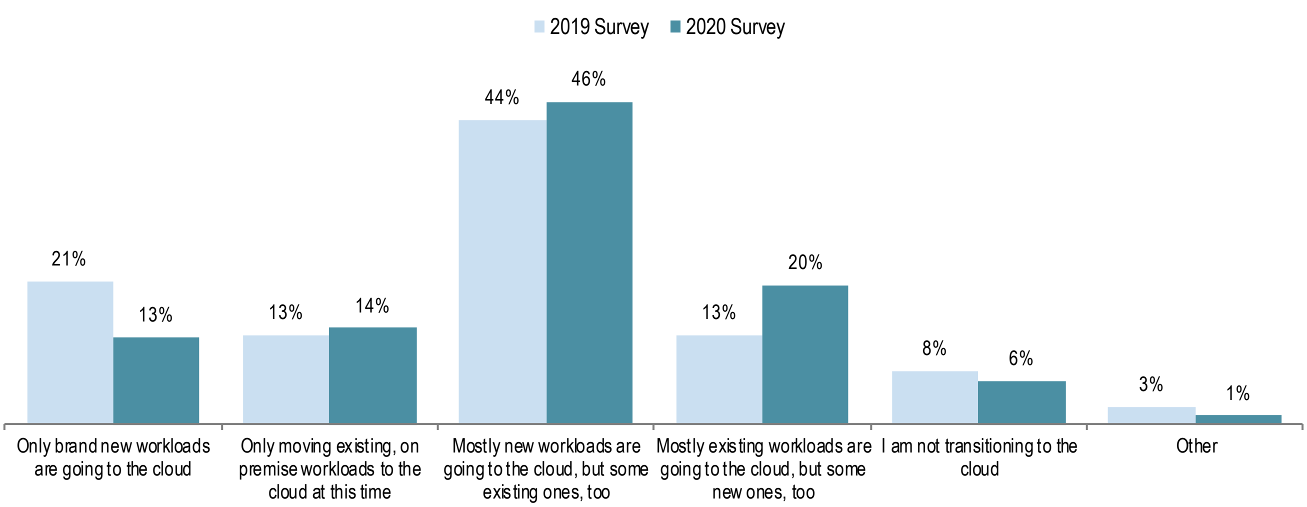
Figure 12: As a percentage of your public cloud budgets, how is spend trending with the following vendors?



Source: Credit Suisse Equity Research

Again, many enterprises move mostly new workloads to the cloud, with some existing workloads (46%). This highlights the high-growth nature of workloads going to public cloud, as enterprises only send workloads there that need to run on public clouds due to the high costs of running applications on the public cloud.

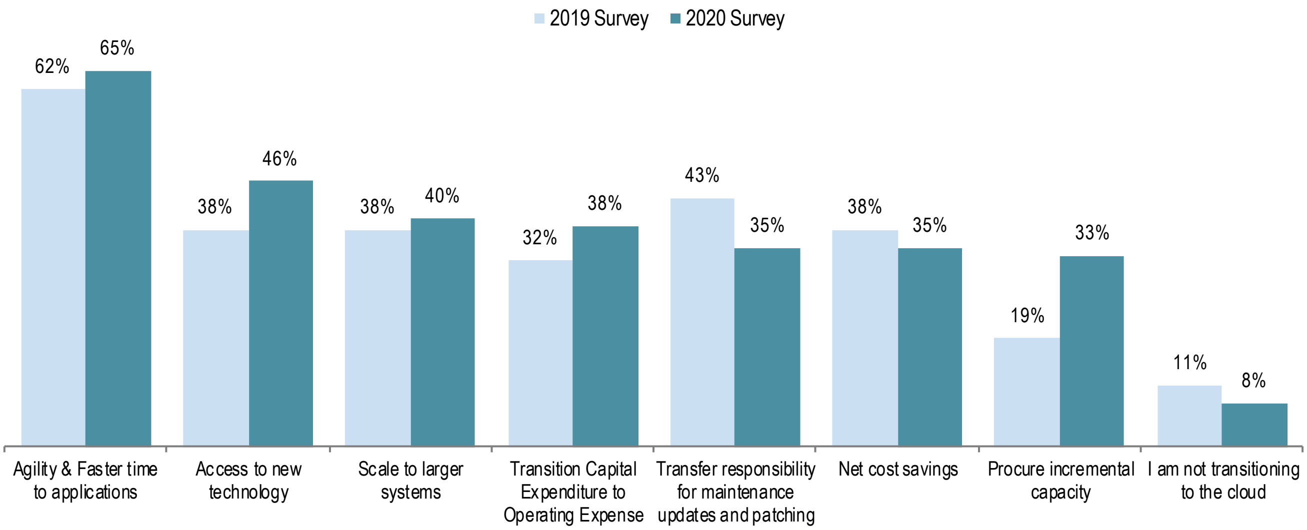
Figure 13: If your company is transitioning any workloads to the public cloud, what types are they?



Source: Credit Suisse Equity Research

Enterprises consistently transition to the public cloud for agility (65%), access to new technology (46%), and scale (40%).

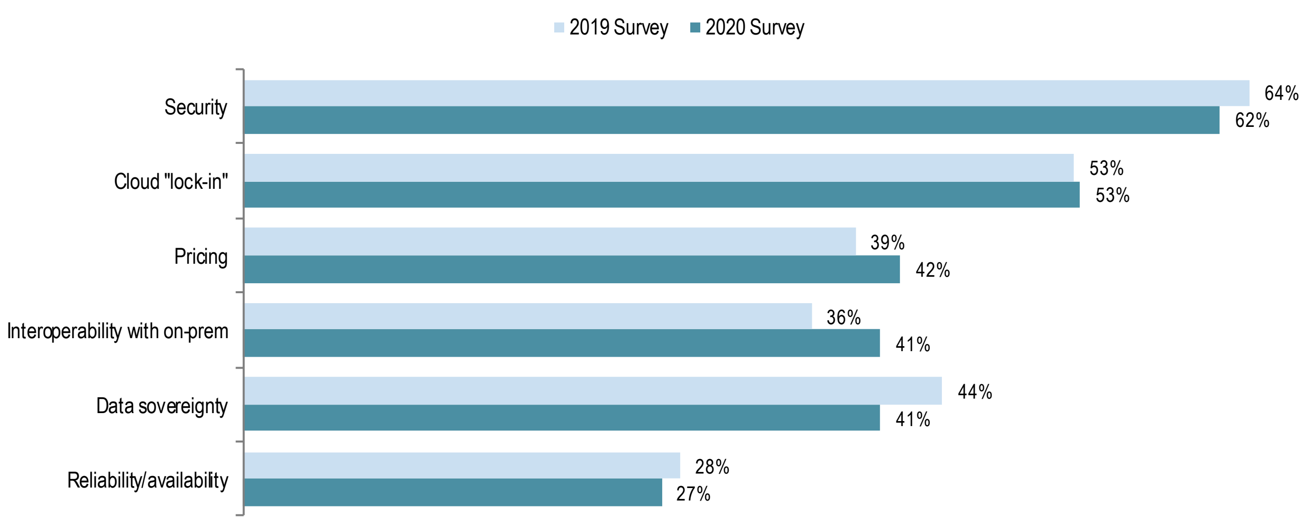
Figure 14: If your company is transitioning to the public cloud, what is the rationale?



Source: Credit Suisse Equity Research

Security concerns loom large for enterprises (62%) with a lack of security control in the public cloud space. Many enterprises also fear being locked in to the cloud, unable to switch over time due to stickiness. Pricing, interoperability with on-premise workloads, and data sovereignty are all packed closely with ~40% of CIOs highly concerned about the factors.

Figure 15: What are your biggest concerns with the move to the public cloud?

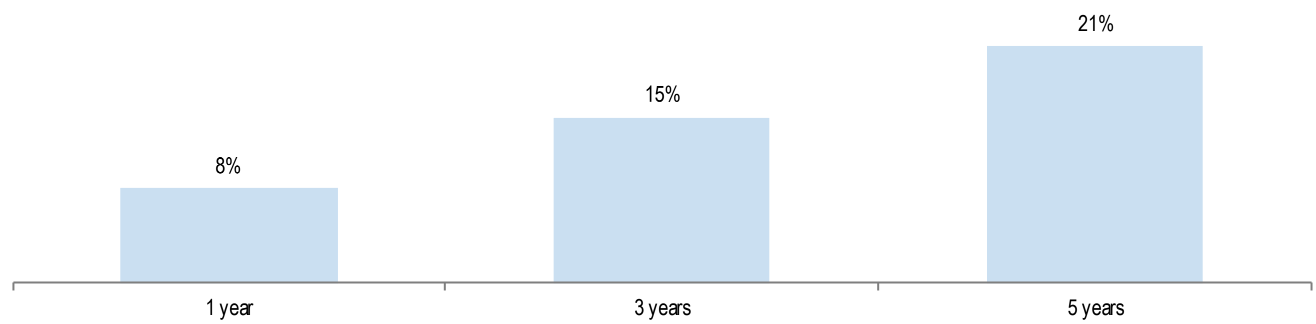


Source: Credit Suisse Equity Research

Hybrid Cloud

By 2025, CIOs expect 21% of IT spend to be allocated to hybrid cloud, over two and a half times hybrid cloud spend expectations for 2020.

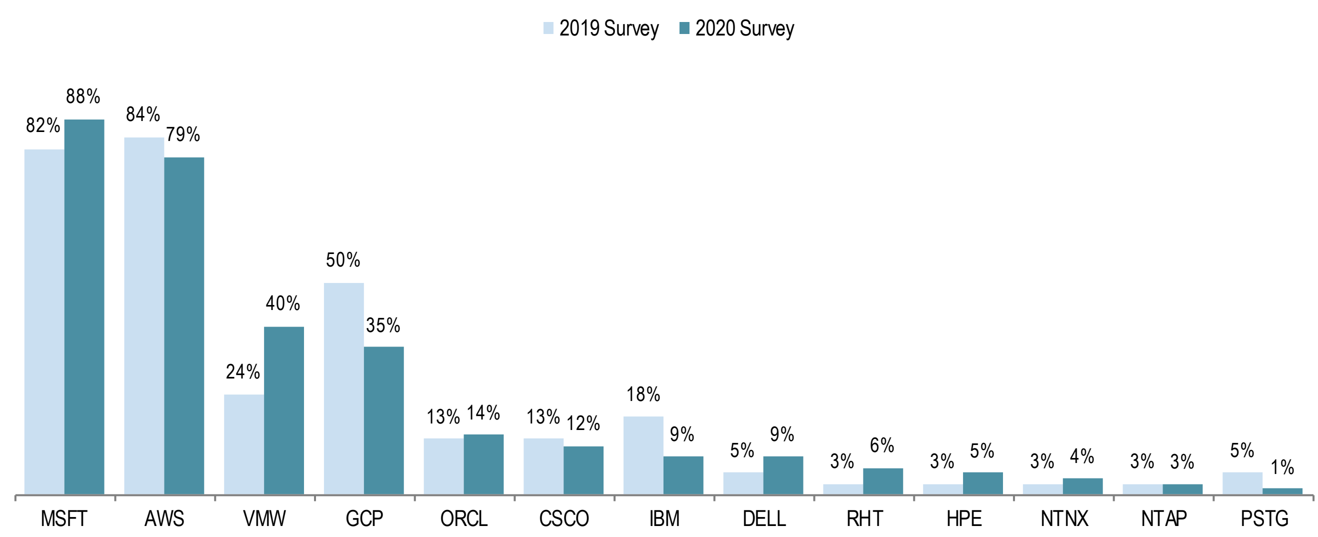
Figure 16: What percent of IT spend do you expect to be allocated to Hybrid Cloud over the next year, 3 years and 5 years?



Source: Credit Suisse Equity Research

We note CSCO's relevance to a hybrid cloud strategy, with 12% of respondents choosing it to be critical to their strategy. Despite CSCO becoming less critical to CIOs within our survey, they still remain a top 10 vendor for hybrid cloud deployments.

Figure 17: What 3 vendors are most critical to your hybrid cloud strategy?

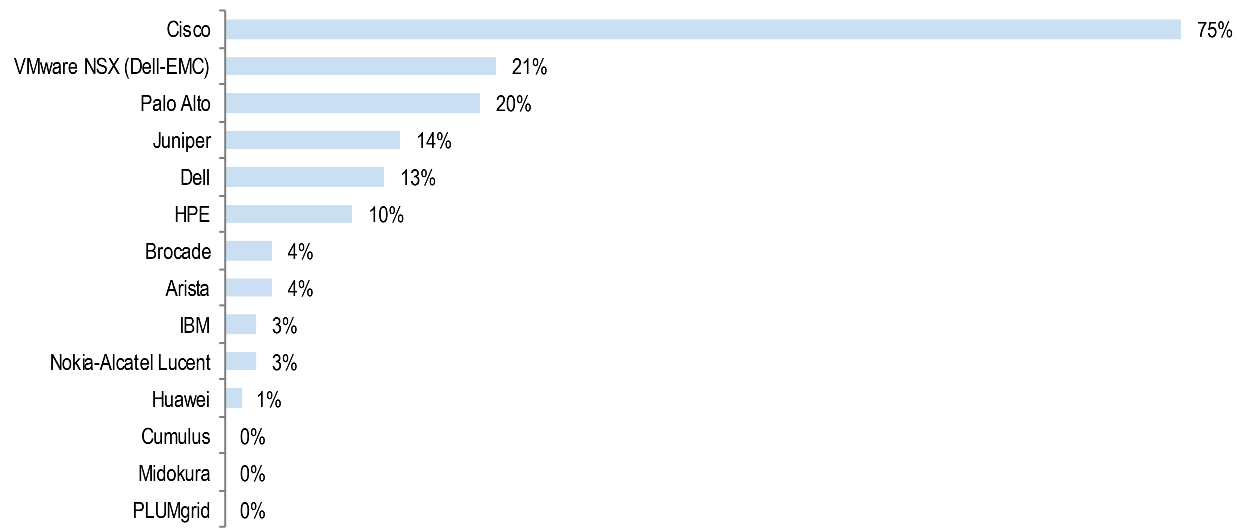


Source: Credit Suisse Equity Research

Data Center and Networking

CSCO was overwhelmingly chosen as the vendor gaining the most wallet share within the networking spend category (75%). Meanwhile, 14% of respondents noted wallet share gains for JNPR. Notably, ANET continues to lag the enterprise channel core vendors within networking when compared to CSCO, HPE, JNPR, and others.

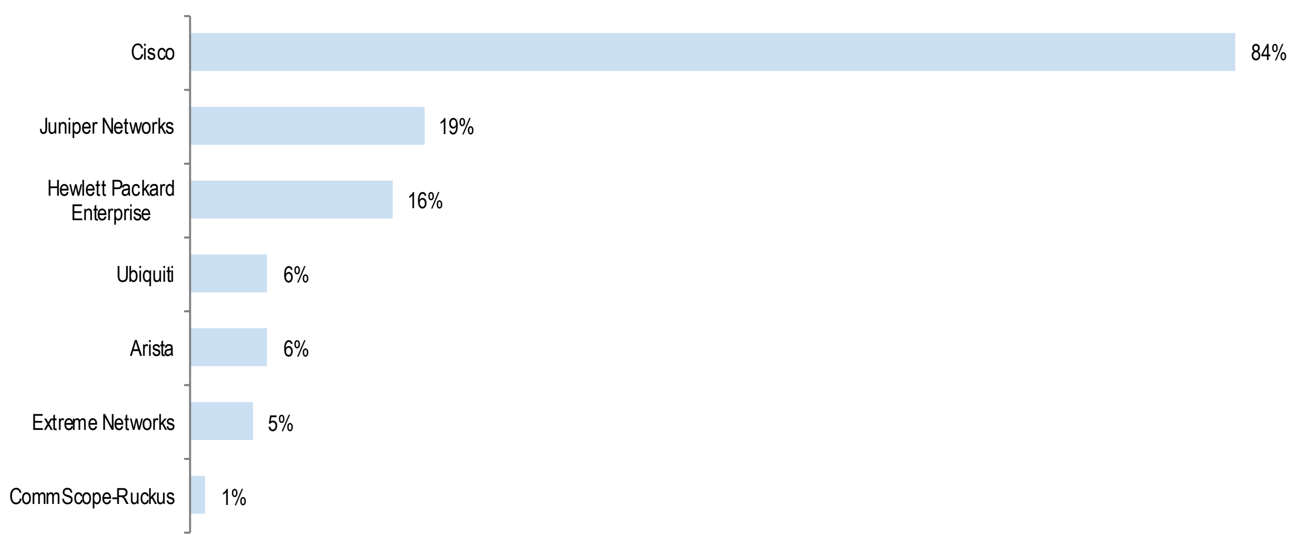
Figure 18: Which of the following networking (switches and routers) vendors are gaining wallet share within your networking spend?



Source: Credit Suisse Equity Research

CSCO was the vendor that most enterprises plan to utilize for campus switching and Wi-Fi solutions (84%), however JNPR has also stood out as a campus vendor at 19%. Ubiquiti (UI), ANET, and COMM all were chosen significantly less, receiving 6%, 6%, and 1%, unsurprising considering their lower traction across enterprise channel partners, distribution, and market share.

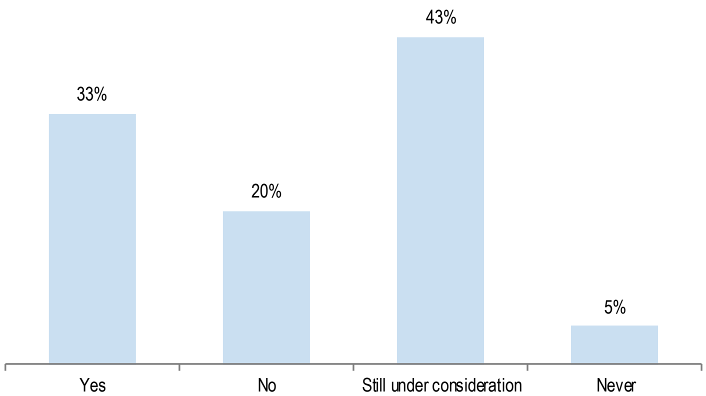
Figure 19: Which vendor(s) do you plan on using for your campus switching and Wi-Fi solutions?



Source: Credit Suisse Equity Research

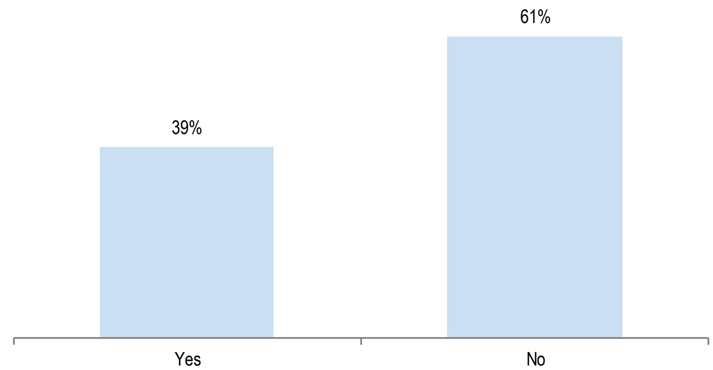
Figure 20 highlights that colocation and wholesale data center facilities still have room to run, with 43% of respondents noting that they are still considering deployments, while only 33% were sure that they would deploy in a colocation or wholesale facility. Figure 21 shows the sticky nature of colocation and wholesale data centers, with 61% of respondents noting they only use 1 provider. We believe this bodes well for EQIX as the data center operator has built global brand and highly interconnected ecosystem that provides benefits to enterprises that utilize it. We are also positive on SWCH and its connectivity savings that it provides enterprises, a factor which we view to be very sticky across key customers/service providers across tech.

Figure 20: For your private cloud deployments within your hybrid clouds, will you be deploying your equipment into Colocation or outsourced wholesale data center facilities?



Source: Credit Suisse Equity Research

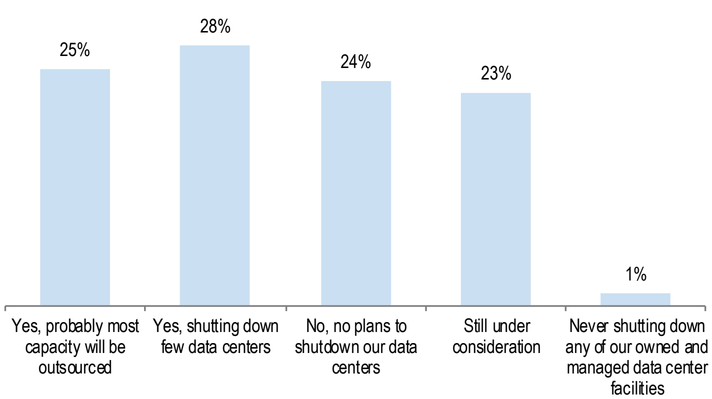
Figure 21: Are you using multiple public colocation and / or outsourced wholesale data center providers for your hybrid cloud?



Source: Credit Suisse Equity Research

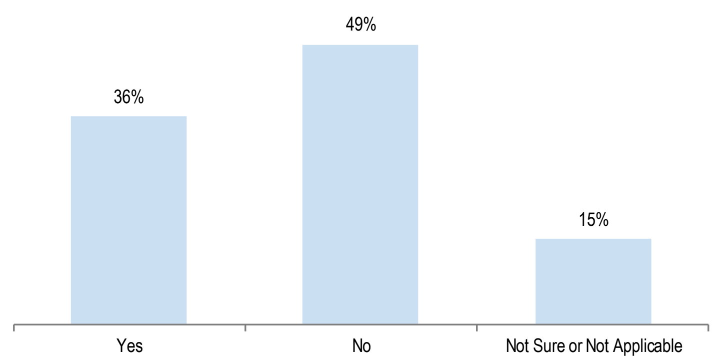
A quarter of respondents expect to shut down most of their owned data center infrastructure. While another 28% will be shutting down a few data centers and 23% are considering shutting down their data centers, we view this as a positive trend for our multi-tenant data center coverage group. That said, CIOs are not overly positive on colocation footprints for 2020, with 49% of respondents expecting no footprint growth for the year (15% are still not sure).

Figure 22: Will you eventually shutdown the majority of your owned data center infrastructure and outsource your data center needs through colocation providers?



Source: Credit Suisse Equity Research

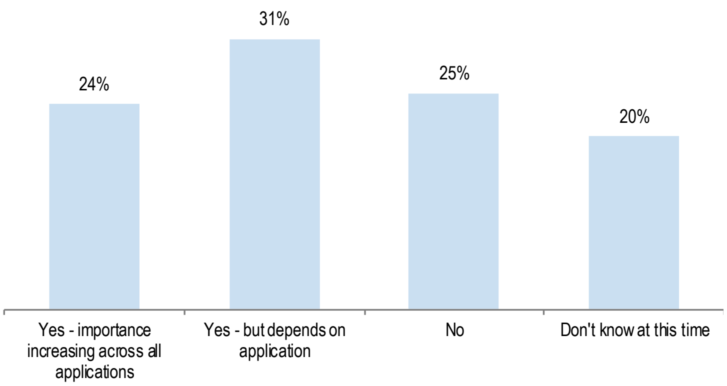
Figure 23: Are your existing colocation footprints (retail or wholesale) growing in 2020 versus 2019?



Source: Credit Suisse Equity Research

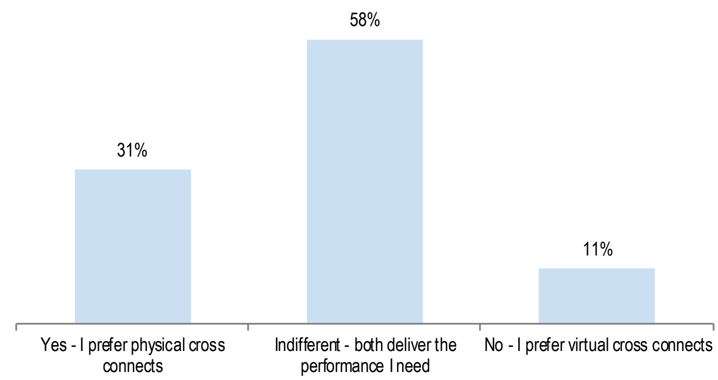
55% of CIOs noted the growing importance of interconnection services for a data center (24% across all apps, 31% app dependent), highlighting our positivity on data centers with high exposure to interconnection revenues (EQIX, SWCH). Importantly, the majority of respondents are indifferent to virtual versus physical cross connects. We expect virtual cross connects to grow in importance over time as they may present greater margin improvement opportunity versus their physical counterparts.

Figure 24: Is the importance of interconnection services at colocation data centers (like Equinix) increasing or decreasing on a relative basis for your compute infrastructure?



Source: Credit Suisse Equity Research

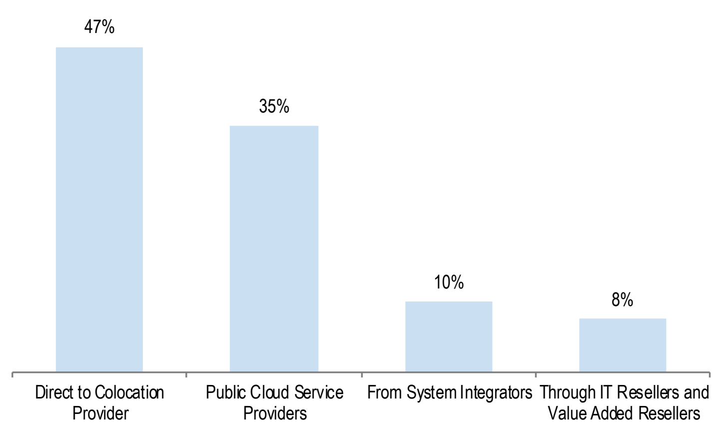
Figure 25: If you use interconnection services with colocation service providers, do you prefer physical cross connects over virtual cross connects?



Source: Credit Suisse Equity Research

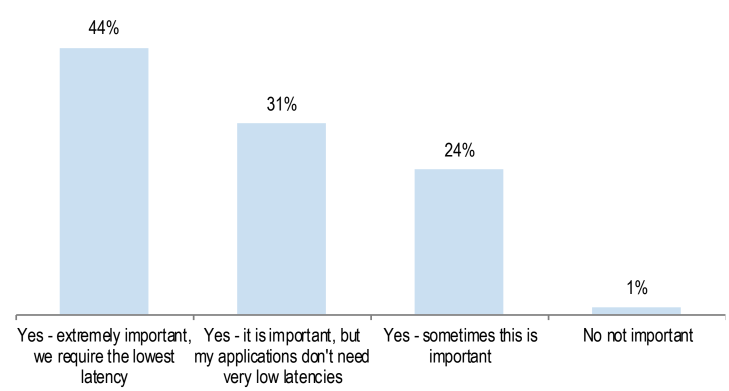
We emphasize the plurality of respondents that source their colocation solutions directly from the colocation provider (Figure 26), a figure which may improve over time. Figure 27 shows that 99% of respondents view low latencies as important, with 44% noting that they require very low latency.

Figure 26: How do you source your colocation service provider solutions?



Source: Credit Suisse Equity Research

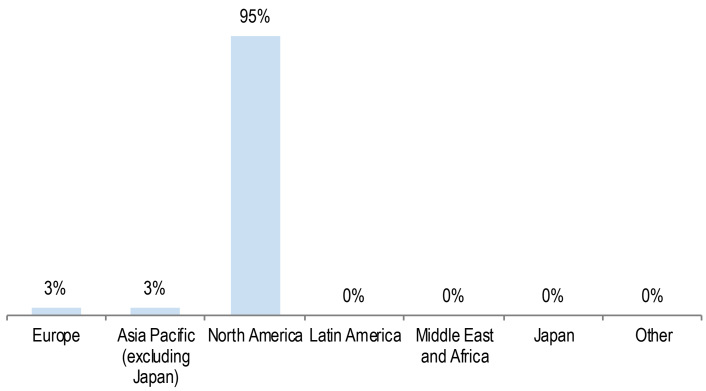
Figure 27: How important are low latencies for your enterprise applications?



Source: Credit Suisse Equity Research

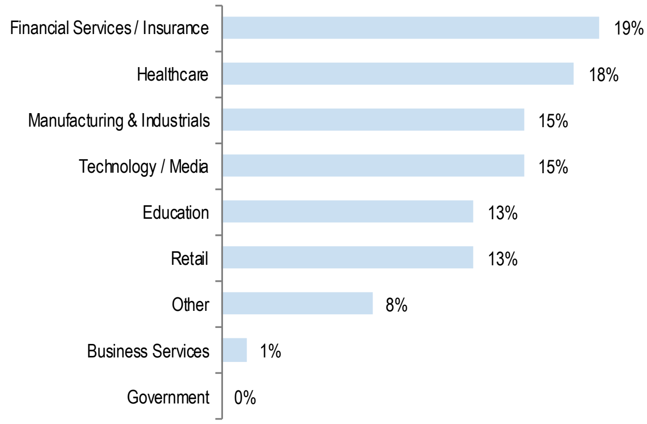
Respondent Demographics

Figure 28: Where does the majority of your IT spend occur?



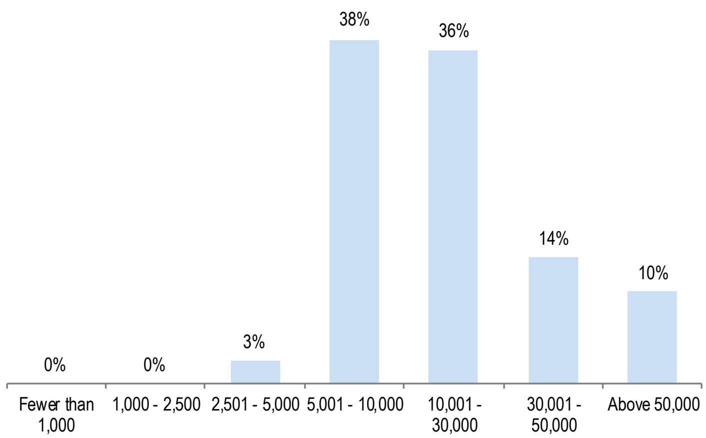
Source: Credit Suisse Equity Research

Figure 29: Which best describes the industry in which your current company operates?



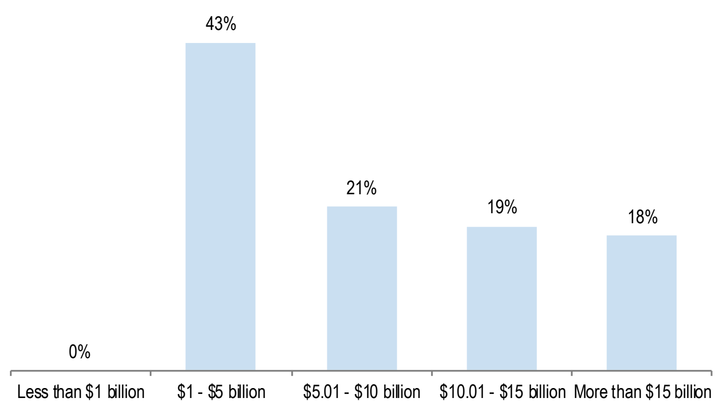
Source: Credit Suisse Equity Research

Figure 30: Approximately how many employees does your current company have?



Source: Credit Suisse Equity Research

Figure 31: Approximately what is your company's annual revenue?



Source: Credit Suisse Equity Research

Companies Mentioned *(Price as of 10-Jan-2020)*
Alphabet (GOOGL.OQ, $1428.96)
Amazon com Inc. (AMZN.OQ, $1883.16)
Arista Networks (ANET.N, $207.46)
Cisco Systems (CSCO.OQ, $47.13)
CommScope Inc. (COMM.OQ, $13.62)
Cumulus Media (CMLS.OQ, $15.84)
Dell Technologies (DELL.N, $49.51)
Equinix, Inc. (EQIX.OQ, $594.0)
Extreme Networks (EXTR.OQ, $7.28)
GCP Applied Tech (GCP.N, $23.18)
Hewlett Packard Enterprise (HPE.N, $15.47)
International Business Machines (IBM.N, $136.69)
Juniper Networks (JNPR.N, $24.16)
Microsoft (MSFT.OQ, $161.34)
NetApp (NTAP.OQ, $63.13)
Nutanix (NTNX.OQ, $34.9)
Oracle Corporation (ORCL.N, $54.45)
Palo Alto Networks, Inc. (PANW.N, $237.87)
Pure Storage (PSTG.N, $18.77)
SAP SE (SAP.N, $136.98)
Salesforce.com (CRM.N, $180.2)
ServiceNow, Inc. (NOW.N, $298.88)
Switch, Inc. (SWCH.N, $15.92)
Ubiquiti Networks (UI.N, $184.22)
VMware Inc. (VMW.N, $149.87)

Disclosure Appendix

Analyst Certification

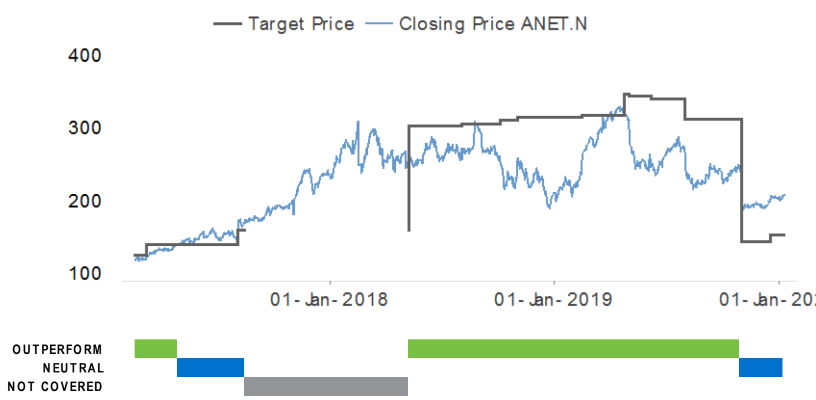
I, Sami Badri, certify that (1) the views expressed in this report accurately reflect my personal views about all of the subject companies and securities and (2) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this report.

3-Year Price and Rating History for Arista Networks (ANET.N)

ANET.N Date	Closing Price (US$)	Target Price (US$)	Rating
17-Feb-17	119.06	125.00	O
08-Mar-17	123.53	140.00	
27-Apr-17	139.65	140.00	N
04-Aug-17	172.05	160.00	
15-Aug-17	170.59		NC
09-May-18	259.42	303.00	O *
03-Aug-18	257.54	305.00	
04-Oct-18	257.74	311.00	
02-Nov-18	257.77	315.00	
15-Feb-19	263.95	317.00	
25-Apr-19	318.11	347.00	
03-May-19	278.41	344.00	
07-Jun-19	246.44	340.00	
02-Aug-19	244.12	312.00	
01-Nov-19	185.30	144.00	N
19-Dec-19	203.75	153.00	

** Asterisk signifies initiation or assumption of coverage.*

Effective July 3, 2016, NC denotes termination of coverage.



3-Year Price and Rating History for Cisco Systems (CSCO.OQ)

CSCO.OQ Date	Closing Price (US$)	Target Price (US$)	Rating
16-Feb-17	33.60	27.00	U
27-Apr-17	33.75	40.00	O
15-Aug-17	32.09		NC
09-May-18	46.04	41.00	N *
16-Aug-18	45.16	43.00	
15-Nov-18	46.77	44.00	
14-Feb-19	48.40	47.00	
16-May-19	55.93	52.00	
14-Aug-19	50.61	50.00	
05-Nov-19	47.76	49.00	
14-Nov-19	44.91	46.00	

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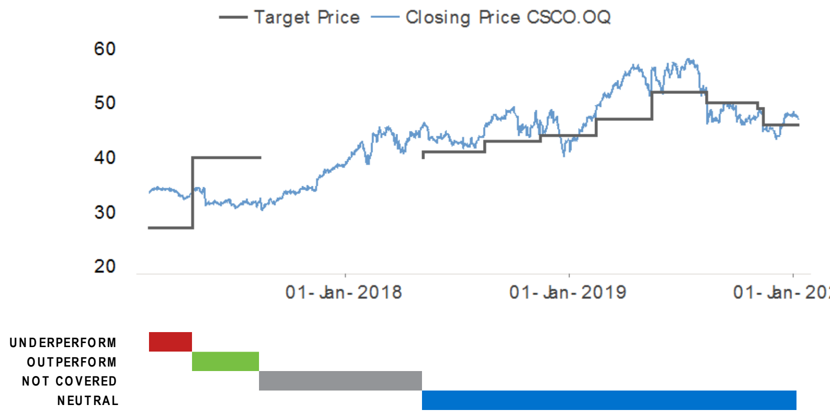
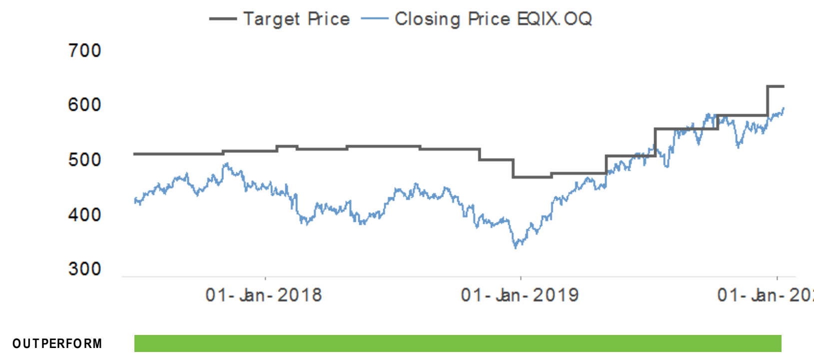
Effective July 3, 2016, NC denotes termination of coverage.



3-Year Price and Rating History for Equinix, Inc. (EQIX.OQ)

EQIX.OQ Date	Closing Price (US$)	Target Price (US$)	Rating
29-Jun-17	421.28	510.00	O *
02-Nov-17	488.68	515.00	
17-Jan-18	441.90	524.00	
15-Feb-18	407.31	519.00	
27-Apr-18	421.15	525.00	
09-Aug-18	444.99	520.00	
02-Nov-18	392.43	500.00	
20-Dec-18	358.21	467.00	
14-Feb-19	420.59	474.00	
02-May-19	465.01	506.00	
11-Jul-19	523.88	556.00	
09-Oct-19	575.00	581.00	
19-Dec-19	575.92	634.00	

** Asterisk signifies initiation or assumption of coverage.*

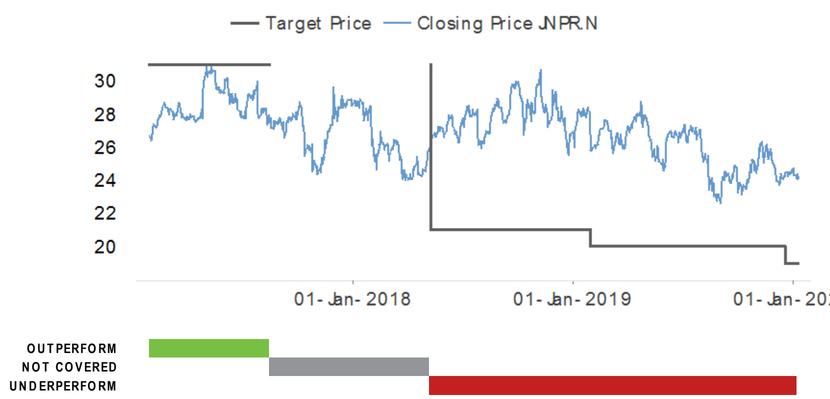


3-Year Price and Rating History for Juniper Networks (JNPR.N)

JNPR.N Date	Closing Price (US$)	Target Price (US$)	Rating
27-Jan-17	26.67	31.00	O
15-Aug-17	27.53		NC
09-May-18	26.17	21.00	U *
30-Jan-19	25.83	20.00	
19-Dec-19	24.43	19.00	

** Asterisk signifies initiation or assumption of coverage.*

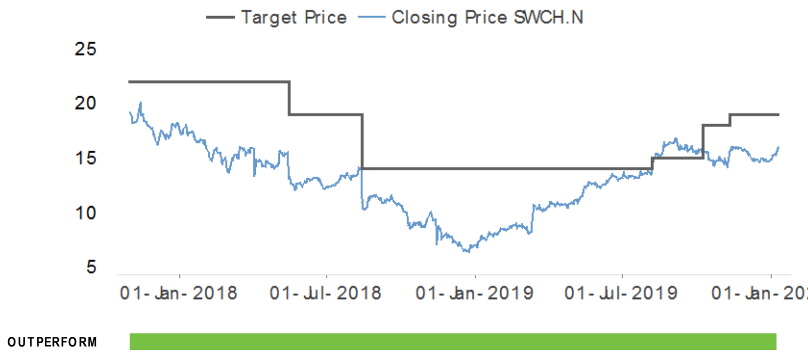
Effective July 3, 2016, NC denotes termination of coverage.



3-Year Price and Rating History for Switch, Inc. (SWCH.N)

SWCH.N	Closing Price	Target Price	
Date	(US$)	(US$)	Rating
31-Oct-17	19.13	22.00	O *
16-May-18	13.20	19.00	
14-Aug-18	10.85	14.00	
07-Aug-19	13.75	15.00	
09-Oct-19	15.51	18.00	
11-Nov-19	15.57	19.00	

** Asterisk signifies initiation or assumption of coverage.*



As of December 10, 2012 Analysts' stock rating are defined as follows:
Outperform (O) : The stock's total return is expected to outperform the relevant benchmark* over the next 12 months.
Neutral (N) : The stock's total return is expected to be in line with the relevant benchmark* over the next 12 months.
Underperform (U) : The stock's total return is expected to underperform the relevant benchmark* over the next 12 months.

**Relevant benchmark by region: As of 10th December 2012, Japanese ratings are based on a stock's total return relative to the analyst's coverage universe which consists of all companies covered by the analyst within the relevant sector, with Outperforms representing the most attractive, Neutrals the less attractive, and Underperforms the least attractive investment opportunities. As of 2nd October 2012, U.S. and Canadian as well as European (excluding Turkey) ratings are based on a stock's total return relative to the analyst's coverage universe which consists of all companies covered by the analyst within the relevant sector, with Outperforms representing the most attractive, Neutrals the less attractive, and Underperforms the least attractive investment opportunities. For Latin America, Turkey and Asia (excluding Japan and Australia), stock ratings are based on a stock's total return relative to the average total return of the relevant country or regional benchmark (India - S&P BSE Sensex Index); prior to 2nd October 2012 U.S. and Canadian ratings were based on (1) a stock's absolute total return potential to its current share price and (2) the relative attractiveness of a stock's total return potential within an analyst's coverage universe. For Australian and New Zealand stocks, the expected total return (ETR) calculation includes 12-month rolling dividend yield. An Outperform rating is assigned where an ETR is greater than or equal to 7.5%; Underperform where an ETR less than or equal to 5%. A Neutral may be assigned where the ETR is between -5% and 15%. The overlapping rating range allows analysts to assign a rating that puts ETR in the context of associated risks. Prior to 18 May 2015, ETR ranges for Outperform and Underperform ratings did not overlap with Neutral thresholds between 15% and 7.5%, which was in operation from 7 July 2011.*

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Analysts' sector weightings are distinct from analysts' stock ratings and are based on the analyst's expectations for the fundamentals and/or valuation of the sector* relative to the group's historic fundamentals and/or valuation:
Overweight : The analyst's expectation for the sector's fundamentals and/or valuation is favorable over the next 12 months.
Market Weight : The analyst's expectation for the sector's fundamentals and/or valuation is neutral over the next 12 months.
Underweight : The analyst's expectation for the sector's fundamentals and/or valuation is cautious over the next 12 months.

**An analyst's coverage sector consists of all companies covered by the analyst within the relevant sector. An analyst may cover multiple sectors.*

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Neutral/Hold*	38%	(26% banking clients)
Underperform/Sell*	13%	(22% banking clients)
Restricted	2%	

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