



State of Security

Key Cybersecurity Topics and Metrics

We review prominent industry developments and investor themes over the past few weeks, plans for the weeks ahead, and highlights of major recent news events in the Cybersecurity sector.

J.P. Morgan Software Forum
October 8-9, 2024 | Stanly Ranch, Napa Valley, CA



Software - Large Cap / Mid & Small Cap

Brian Essex, CFA ^{AC}
(1-212) 622-5990
brian.essex@jpmchase.com
J.P. Morgan Securities LLC

Charlotte Bedick
(1-212) 270-2638
charlotte.bedick@jpmchase.com
J.P. Morgan Securities LLC

Gabrielle Jabre
(1-212) 622-0845
gabrielle.jabre@jpmorgan.com
J.P. Morgan Securities LLC

Harsh Goyal
(91-22) 6157-3455
harsh.x.goyal@jpmchase.com
J.P. Morgan India Private Limited

Select Topics to Follow

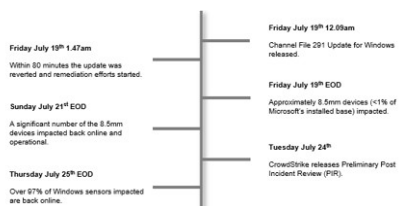
CrowdStrike: Global IT Outage

The IT outage caused by a CrowdStrike Falcon content update continues to evolve on a daily basis. We view the incident as a black eye for the company to recover from, but expect the quality of response from the company will go a long way toward supporting the business and the brand longer term. Customers in the U.S. woke up on July 19th to news of an outage but also to a solution, a company that had been working toward recovery through the night, and an executive team that was able to marshal immediate support of IT leaders and Government agencies while maintaining a high level of transparency. The impact of the outage will be discussed for years, but we believe the company can emerge with a favorable reputation and an ability to take share as a best of breed platform vendor longer term. Near-term, we expect fundamental headwinds will include credits to customers under SLAs, delayed/slipped/lost business, costs related to business interruption/recovery at customers, and incentives offered to customers over the next year. The latest questions we've fielded from investors involve the extent of legal exposure CRWD could have but we continue to think exposure will be capped at thresholds in contracts and channel conversations so far indicate that vendors with better IT management practices seem to have fared better than expected.

Notes

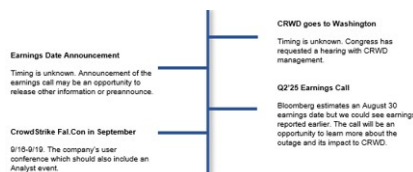
- [CrowdStrike: Delivering a Master Class on Incident Response](#)
- [CrowdStrike: Outage Disruptive But A Long-Term Buying Opportunity](#)

Figure 1: Timeline of Events



Source: Company reports, J.P. Morgan.

Figure 2: Potential Catalysts Ahead



Source: J.P. Morgan.

See page 25 for analyst certification and important disclosures, including non-US analyst disclosures.

J.P. Morgan does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.

Wiz’s \$23bn Takeover News Shifts

The Wall Street Journal reported that talks between Google (covered by JPM analyst Doug Anmuth) and Wiz fell apart, with Wiz deciding to pursue an IPO instead. While we have no knowledge of a deal or conversations and in spite of the news that talks fell apart, we think the news bodes well for Security Software valuations due to the high implied valuation reported in the article. The company most recently completed \$1bn of Series E funding on May 7, 2024, putting the company’s pre-money valuation at \$11.9bn. ([Wall Street Journal](#))

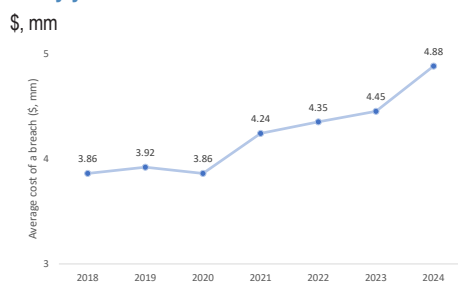
News Emerges of Tenable Takeover Interest

[Bloomberg](#) this week reported that Tenable hired an advisor after receiving takeover interest. We note that we have no knowledge of a deal at this point and have not seen a company comment regarding the transaction. TENB shares appreciated over 8.5% over the past 5 trading days. The company reported its 2Q24 earnings results last night.

IBM Estimates Average Cost of Data Breach Hit \$4.9mm

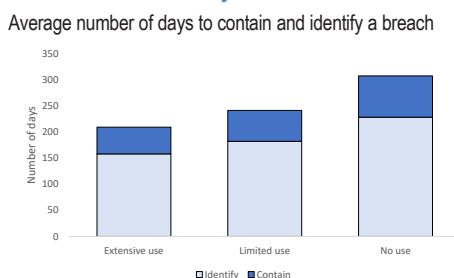
The cost of a data breach increased by 10% y/y in 2024, averaging roughly \$4.9mm according to IBM’s [Cost of a Data Breach Report](#). The increase in costs is largely associated with the combination of business disruptions and post-breach customer support and remediation. Over 70% of breached organizations reported that the cyber attack caused a significant or very significant business disruption. More than half of the organizations are passing through these costs to their customers. Fighting AI with AI remains important for Security, with over 67% of organizations deploying AI for Security, an increase of 10% y/y. AI in Security is helping lower the time and cost of a potential cyber attack by approximately 98 days and \$2.2mm, respectively, compared to those with no AI use in prevention workflows. In our opinion, vendors will continue to leverage AI for Security.

Figure 3: Average Cost of a Breach Increased by 10% y/y in 2024



Source: IBM Cost of a Data Breach Report

Figure 4: Extensive Use of AI in Security Can Help Reduce Time to Identify and Contain a Breach



Source: IBM Cost of a Data Breach Report

Zscaler Reports 18% y/y Growth in Ransomware

As of April 2024, ransomware surged by 18% y/y, according to the [Zscaler ThreatLabz 2024 Ransomware Report](#). In 2023 ransomware payments exceeded \$1bn, and a ransom payout by a single company reached more than double the highest publicly known ransom payment at \$75mm. The energy sector experienced the highest increase in ransomware attempts, at 527% y/y. Geographically, the US, UK and Germany saw the largest increase in ransomware attacks over the past year, at 102%, 50% and 35%, respectively. Breaches (particularly high-profile ones such as UNH and Microsoft) are prompting increased interest and awareness around the importance of Security, lending support for Cybersecurity spend, in our opinion.

2023 OpenAI Breach

Earlier this month, it was [revealed](#) that OpenAI suffered a hack last year regarding details on the design of its AI technologies. The hack breached an online forum discussing the details of the company’s latest AI technologies, but not its AI core systems. Employees and OpenAI’s board of directors were told about the breach in April 2023. The news was not shared with law enforcement agencies, nor the public, as no known information pertaining to customers or partners had been stolen, and the company did not believe this breach was a state sponsored

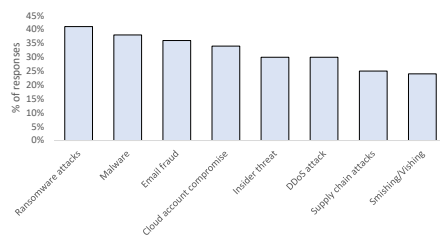
attack. The breach raises fear of potential future hacks from foreign adversaries, and the company has already [prevented](#) five covert influence operations aimed at using its models for deceptive activity this year.

2024 Voice of the CISO

CISOs continue to face heightened concerns as the threat landscape continues to evolve. Roughly 70% of CISOs feel at risk of experiencing a material cyber attack over the next year according to [2024 Voice of the CISO report](#). Most CISOs are aware of the potential risks, and a little under half view their organization unprepared to cope with a targeted cyber attack, showing an increasing disconnect between awareness and preparedness of an organization’s security posture. CISOs view ransomware, malware, email fraud and cloud account compromise as the leading threats over the next year. Ransomware rose to the top of the list in 2024. Consolidation remains a key priority for CISOs, as Security budgets remain tight in the current macro environment, and almost half (48%) of CISOs have been asked to cut staff, delay backfills or reduce spending. Enterprises still have a desire to consolidate the number of vendors they need to manage, and we think that the Security Software market remains ripe for consolidation, expecting best-of-bread platforms will continue to benefit across our coverage universe.

Figure 5: Email fraud, insider threats, DDoS attacks, and cloud account compromise remain on the list

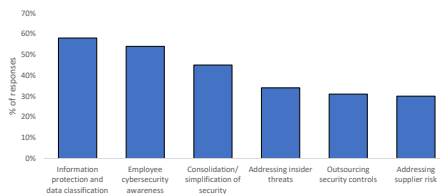
What, if anything, do you perceive to be the biggest cybersecurity threats within your organization/industry in the next 12 months? (Pick up to three.)



Source: ProofPoint's 2024 Voice of the CISO

Figure 6: Data Security, Human Risk and Consolidation are top CISO priorities

What are the top priorities for your organization's IT security department over the next two years? (Pick up to three.)



Source: ProofPoint's 2024 Voice of the CISO

Executive Changes

- **Check Point:** In connection with its earnings release on July 24th, Check Point announced the appointment of a new CEO, Nadav Zafir, who will assume the role in December 2024. See greater detail in our [note](#).
- **Rapid7:** On July 9th, RPD [announced](#) the promotion of three sales leaders to General Manager and that its Chief Customer Officer Mr. Larry D’Angelo stepped down on July 12, 2024 to pursue a new opportunity. See greater detail in our [note](#).
- **CS Disco:** CS Disco appointed Mr. Richard Crum to Executive Vice President and Chief Product Officer, who succeeded Mr. Kevin Smith on July 10th.
- **Cellebrite:** The creation of Cellebrite Federal Solutions was [announced](#) on July 17th, and will include a board of independent directors spanning previously high ranking officials from U.S. Special Forces, Department of Homeland Security, 9/11 Review Commission and SAP. See greater detail in our [note](#).

Notable Upcoming JP Morgan Events

Please reach out to your sales representative for more details.

- **J.P. Morgan Summer Series: Security Software** - Webinar - Aug 20 at 11am ET - [Registration link](#)

- **J.P. Morgan US All Stars Conference** - London - Sep 17-18
- **J.P. Morgan Software Forum** - Napa Valley - Oct 8-9
- **J.P. Morgan Equity Opportunities Forum** - Miami Beach - Nov 13-14

Figure 7: Upcoming On-cycle Earnings

August				
Monday	Tuesday	Wednesday	Thursday	Friday
5	6 Fortinet (4:30pm ET) Rapid7 (4:30pm ET) Qualys (5:00pm ET)	7	8 CyberArk (8:30am ET) N-able (8:30am ET) CS Disco (5:00pm ET)	9
12	13	14	15 Cellebrite (8:30am ET)	16

Source: Company reports.

Performance and Valuation

Despite ongoing levels of elevated demand, we expect interest rates and macro uncertainty will remain primary factors that move multiples across our coverage universe (Figure 8). Security multiples have continued to improve relative to Software overall (ex-Security) over the past year. In our view, valuation levels reflect better than anticipated performance across our coverage over the last few quarters relative to lower expectations due to conservative commentary from management teams and expectations for interest rate cuts beginning at the end of 2024. We note that average multiples for Security stocks we follow tend to be more volatile than the Software stocks we track due to a higher concentration of high growth, high multiple stocks in the cohort.

Figure 8: Historical View of Multiples

2010-July 2024

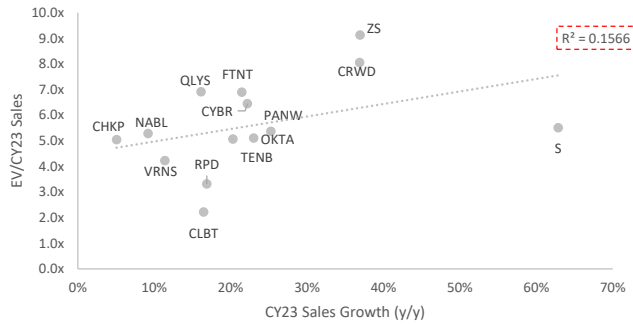


Source: Bloomberg Finance L.P., J.P. Morgan Research.

Growth premium materializing for those with balanced growth. Companies that read the room properly have focused on balanced growth with better profitability and have realized stock price appreciation driven by both fundamentals and multiples YTD. The growth premium we saw in 2021 and 2022 had evaporated by the beginning of 2023 due in part to a rising rate environment and growing macro concerns. However, we have recently begun to see a return of the growth premium, particularly for stocks that can deliver balanced growth and profitability (Figure 10).

Figure 9: Growth premium had evaporated by the beginning of 2023

EV/CY23 Sales as of 1/1/23



Source: Bloomberg Finance L.P.

Figure 10: Beginning to see appreciation for growth in valuation multiples again

EV/CY24 Sales as of 7/29/24



Source: Bloomberg Finance L.P.

Consensus estimates remain reasonable. Security Software demand remains high and budgets are stable according to our industry conversations. Although elevated multiples still imply that buy-side bars are a little higher, consensus sell-side estimates remain reasonable in our view, and vendor commentary has driven consensus estimates lower for CY24. Consensus reflects lower revenue and billings growth expectations for CY24, which were revised lower by -1.2% and -2.4%, respectively, on average over the last year.

Figure 11: CY24 Revenue Consensus Estimate Revisions

7/29/23 vs 7/29/24



Source: Bloomberg Finance L.P.

Figure 12: CY24 Billing Consensus Estimate Revisions

7/29/23 vs 7/29/24



Source: Bloomberg Finance L.P.

Our coverage universe now trades at an average of 8.6 x EV/CY24E sales as of 7/31/24 compared with 4.8x just prior to our industry initiation (1/20/23 for EV/CY23E sales).

Figure 13: Security Comps

As of 7/31/2024

Company	Ticker	Rating	Pricing					Valuation																	
			Price 7/31/2024	JPM PT	Upside (%)	Market Cap	Current EV	EV/Sales CY24	EV/Sales CY25	EV/Sales/G CY24	EV/Sales/G CY25	EV/EBITDA CY24	EV/EBITDA CY25	EV/FCF CY24	EV/FCF CY25	EV/(FCF-SBC) CY24	EV/(FCF-SBC) CY25	EV/ARR CY24	EV/ARR CY25	EV/ARR/G CY24	EV/ARR/G CY25	P/E CY24	P/E CY25		
Cellebrite DI Ltd	CLBT	Overweight	13.70	14.00	2%	2,696	2,420	6.4x	5.2x	0.31x	0.22x	31.0x	23.3x	23.6x	18.5x	31.6x	24.7x	6.1x	5.0x	0.23x	0.24x	40.3x	31.9x		
Check Point Software Technologies Ltd	CHKP	Neutral	183.45	180.00	-2%	20,840	17,782	6.9x	6.5x	1.06x	0.91x	14.9x	13.8x	16.6x	16.0x	19.6x	19.1x	6.3x	5.9x	0.86x	0.87x	20.1x	18.3x		
Crowdstrike Holdings Inc	CRWD	Overweight	231.96	330.00	42%	58,028	55,069	13.9x	11.1x	0.47x	0.45x	56.8x	41.2x	72.5x	39.1x	---	---	12.9x	10.2x	0.49x	0.40x	63.9x	49.4x		
CyberArk Software Ltd	CYBR	Overweight	256.38	300.00	17%	12,239	12,002	12.8x	10.2x	0.48x	0.41x	---	56.6x	---	58.3x	---	---	12.1x	10.0x	0.42x	0.46x	---	65.7x		
Fortinet Inc	FTNT	Neutral	58.04	63.00	9%	44,720	42,690	7.4x	6.5x	0.83x	0.47x	24.9x	21.6x	24.9x	21.3x	29.8x	25.5x	6.9x	6.0x	0.73x	0.40x	33.2x	29.8x		
N-able Inc/US	NABL	Neutral	13.94	14.00	0%	2,609	2,805	6.0x	5.4x	0.56x	0.50x	17.0x	15.1x	31.9x	27.6x	73.8x	59.2x	6.0x	5.4x	0.64x	0.45x	31.7x	26.8x		
Okta Inc	OKTA	Neutral	93.94	110.00	17%	15,732	14,567	5.7x	5.1x	0.44x	0.38x	28.7x	25.2x	25.8x	22.4x	---	---	5.6x	4.9x	0.49x	0.34x	39.5x	34.5x		
Palo Alto Networks Inc	PANW	Overweight	324.73	340.00	5%	115,149	109,917	13.0x	11.3x	1.02x	0.78x	46.1x	38.0x	31.5x	29.4x	49.6x	48.1x	12.5x	10.8x	1.12x	0.71x	59.0x	50.3x		
Qualys Inc	QLYS	Underweight	149.14	125.00	-16%	5,626	5,083	8.4x	7.7x	0.88x	0.90x	19.9x	18.3x	23.5x	20.9x	39.0x	34.4x	8.0x	7.4x	0.83x	0.90x	28.2x	25.5x		
Rapid7 Inc	RPD	Neutral	39.34	46.00	17%	2,912	3,431	4.1x	3.8x	0.54x	0.51x	17.2x	15.3x	21.4x	18.5x	57.8x	44.1x	4.0x	3.8x	0.64x	0.58x	18.1x	17.7x		
SentinelOne Inc	S	Overweight	22.90	25.00	9%	8,336	7,562	9.3x	7.3x	0.29x	0.27x	---	72.7x	---	---	---	---	8.2x	6.4x	0.29x	0.24x	---	---		
Tenable Holdings Inc	TENB	Overweight	45.92	56.00	22%	5,450	5,297	5.8x	5.0x	0.41x	0.30x	30.1x	23.5x	26.9x	20.6x	---	73.6x	5.4x	4.6x	0.30x	0.26x	41.4x	31.9x		
Varonis Systems Inc	VRNS	Overweight	55.13	59.00	7%	6,645	6,106	11.1x	9.8x	1.04x	0.77x	---	---	72.8x	56.2x	---	---	9.6x	8.4x	0.54x	0.56x	---	---		
Zscaler Inc	ZS	Overweight	179.35	230.00	28%	27,634	25,394	11.0x	8.3x	0.43x	0.25x	48.2x	35.4x	51.4x	35.6x	---	---	10.4x	8.1x	0.51x	0.28x	60.4x	44.6x		
							Average	8.7x	7.4x	0.62x	0.51x	30.4x	30.8x	35.2x	29.6x	43.0x	41.1x	8.1x	6.9x	0.58x	0.48x	39.6x	35.5x		
							Median	7.9x	6.9x	0.51x	0.46x	28.7x	23.5x	26.4x	22.4x	39.0x	39.3x	7.4x	6.2x	0.52x	0.42x	39.5x	31.9x		
							High growth avg, >20% y/y	10.7x	8.4x	0.39x	0.32x	45.3x	45.8x	49.2x	37.9x	31.6x	24.7x	9.9x	7.9x	0.39x	0.32x	54.9x	47.9x		
							Low growth average, <20% y/y	7.6x	6.8x	0.75x	0.61x	19.2x	15.8x	30.6x	25.9x	44.9x	43.4x	7.1x	6.3x	0.68x	0.56x	33.9x	29.4x		
Other Security Related JPM Coverage																									
Box Inc	BOX	Overweight	28.12	32.00	14%	4,183	3,988	3.7x	3.5x	0.96x	0.60x	12.1x	10.6x	11.4x	10.0x	27.2x	21.7x	3.7x	3.4x	0.96x	0.49x	17.9x	14.7x		
Dropbox Inc	DBX	Neutral	23.92	29.00	21%	8,150	8,352	3.3x	3.2x	1.71x	1.21x	8.3x	7.9x	8.9x	9.0x	14.2x	14.1x	3.2x	3.2x	1.36x	1.57x	11.5x	10.9x		
Datadog Inc	DDOG	Overweight	116.44	140.00	20%	41,450	39,412	15.2x	12.5x	0.64x	0.60x	---	---	53.5x	56.0x	---	---	13.9x	11.4x	0.55x	0.53x	---	67.3x		
Dynatrace Inc	DT	Overweight	43.92	55.00	25%	13,214	12,377	7.8x	6.7x	0.40x	0.41x	53.6x	41.1x	37.7x	25.0x	---	55.0x	7.5x	6.4x	0.43x	0.38x	36.3x	29.7x		
Elastic NV	ESTC	Overweight	109.67	128.00	17%	11,112	10,596	7.5x	6.5x	0.39x	0.41x	43.4x	33.1x	64.0x	45.0x	---	---	7.0x	6.1x	0.38x	0.41x	---	61.3x		
Cloudflare Inc	NET	Neutral	77.50	80.00	3%	26,240	25,808	15.6x	12.3x	0.55x	0.46x	---	---	---	---	---	---	14.2x	11.3x	0.50x	0.43x	---	---		
Non-Covered Security																									
BlackBerry Ltd	BB	--	2.42	--	--	1,426	1,391	2.3x	2.2x	-0.09x	0.64x	---	32.7x	---	36.0x	---	---	---	---	---	---	73.5x			
Gen Digital Inc	GEN	--	25.99	--	--	16,556	24,139	6.2x	6.0x	2.63x	1.92x	10.1x	9.7x	10.6x	17.8x	11.2x	19.7x	---	---	---	---	12.1x	10.9x		
Palantir Technologies Inc	PLTR	--	26.89	--	--	64,539	60,671	22.5x	18.6x	1.05x	0.91x	66.6x	57.3x	67.9x	56.4x	---	---	---	---	---	---	---	68.8x		
Rubrik Inc	RBRK	--	37.20	--	--	6,545	6,585	8.0x	6.3x	0.26x	0.23x	---	---	---	---	---	---	---	---	---	---	---	---		
SecureWorks Corp	SCWX	--	7.70	--	--	665	618	1.9x	1.8x	-0.19x	0.44x	63.0x	40.5x	---	---	---	---	---	---	---	---	---	60.8x		
							Total Security Average	8.6x	7.3x	0.68x	0.60x	32.9x	30.1x	35.6x	30.5x	35.4x	36.6x	8.2x	6.9x	0.61x	0.53x	34.2x	39.3x		
							Total Security Median	7.5x	6.5x	0.54x	0.47x	29.4x	25.2x	26.9x	25.0x	30.7x	30.0x	7.2x	6.3x	0.52x	0.44x	33.2x	31.9x		

Source: Bloomberg Finance L.P., J.P. Morgan. DBX, DDOG, NET covered by Mark Murphy; BOX, DT, ESTC covered by Pinjalim Bora

New Federal Contracts

Federal spending continues to be an area of importance for security names as the US government develops and upgrades its IT security standards, agencies, and infrastructure. We track new security contracts and dollar amounts for our covered companies, but note that new federal contracts (both volume and value) typically peak in the second and third quarters of the calendar year from the federal appropriations cycle and agency budget flush. Additionally, new contract awards can be lumpy and span multiple years. However, we view these contracts as a growing opportunity for security vendors as federal budgets are expected to continue to increase (Figure 16). We expect federal spending will remain elevated compared to discretionary spending growth overall.

Figure 14: FedRAMP Marketplace Approval Status

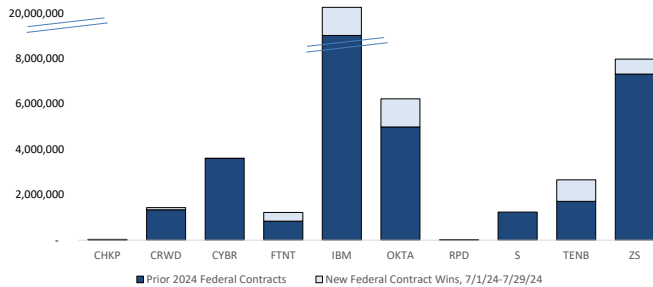
As of 6/29/24

CHKP	None listed on FedRAMP marketplace website.
CLBT	Announced intent to certify, none yet listed on FedRAMP marketplace website.
CRWD	CrowdStrike Falcon Platform is Authorized, Moderate Impact. Falcon Platform for Government (High) is Ready, High Impact.
CYBR	Endpoint Privilege Manager and Identity for Government are Authorized, High Impact.
FTNT	None listed on FedRAMP marketplace website.
NABL	None listed on FedRAMP marketplace website.
NET	Cloudflare for Government is Authorized, Moderate Impact.
OKTA	IDaaS Government High Cloud (GHC) is Authorized, High Impact. IDaaS Regulated Cloud is Authorized, Moderate Impact.
PANW	Government Cloud Services is Authorized, Moderate Impact. GCS-HIGH is in Process, High Impact.
QLYS	Qualys Cloud Platform is Authorized, Moderate Impact.
RPD	InsightCloudSec for Government is Ready, Moderate Impact
S	SentinelOne Singularity Platform is Authorized, Moderate Impact. Singularity Platform High is in Process, High Impact.
SPLK	Splunk Cloud for FedRAMP Moderate is Authorized, Moderate Impact. Splunk Cloud for FedRAMP High is in Process, High Impact.
TENB	Tenable.io is Authorized, Moderate Impact. Tenable Cloud Security for US Government (Ermetic) is in Process, Moderate Impact.
VRNS	Varonis Data Security Platform and DatAdvantage Cloud are in Process, Moderate Impact.
ZS	ZPA (Zero Trust Exchange) and ZIA (Secure Web Gateway) are Authorized, Moderate Impact. ZPA (Zero Trust Networking) and ZIA (Secure Web Gateway - High) are Authorized, High Impact.

Source: marketplace.fedramp.gov

Figure 15: 2024 New Federal Contract Awards by Company

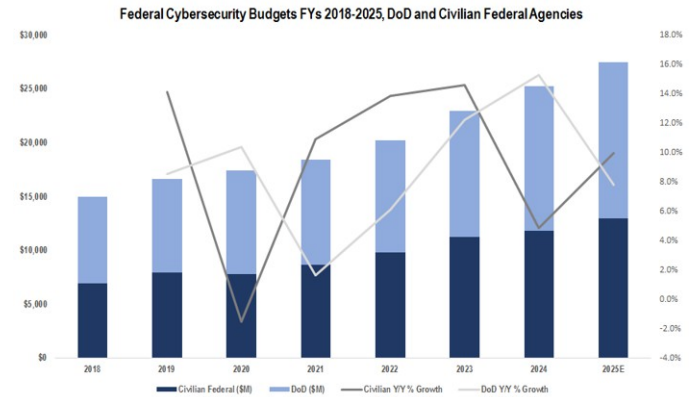
7/1/24 - 7/29/24



Source: USAspending.gov

Figure 16: US Government Security Spending Growing

FYs 2018-2025 (FY24 proposed), DoD and Civilian Federal Agencies

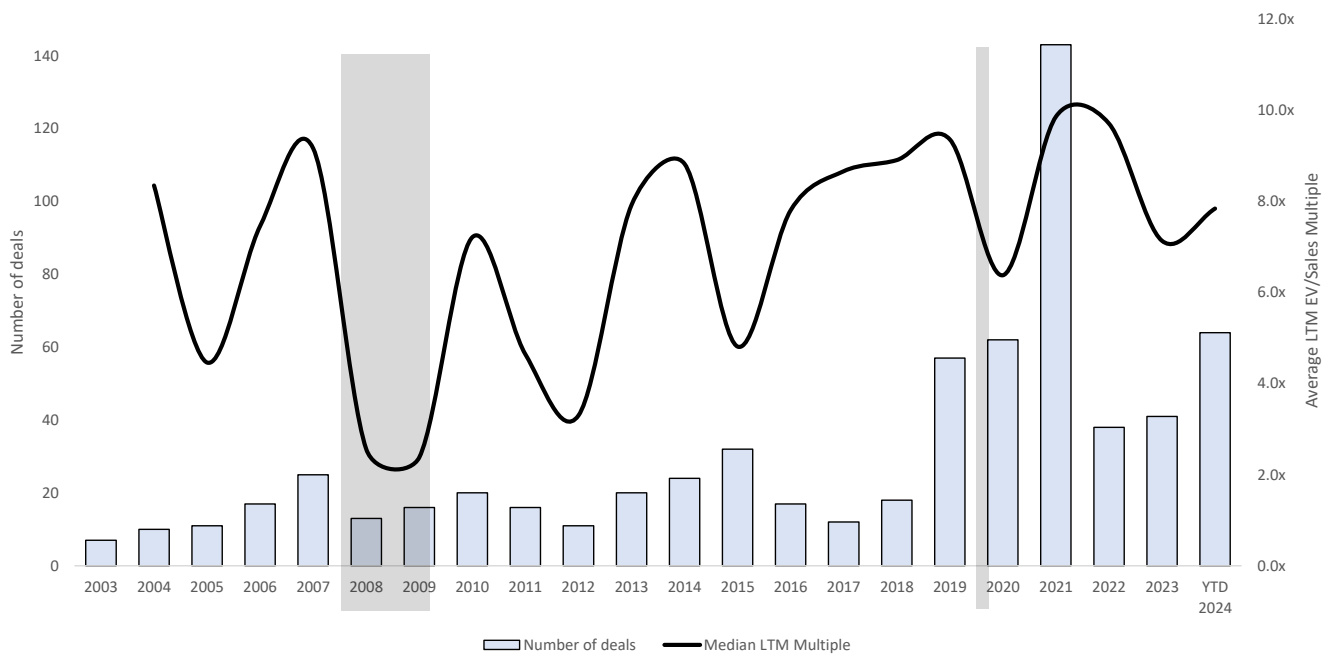


Source: Congress.gov

Partnerships and Acquisitions

Security Software has historically been a sector in which a great deal of innovation occurs at the private company level. As a result, partnerships and acquisitions have also been meaningful. Cash conservation remains a focus considering the macro environment, but we continue to believe we will see meaningful consolidation and partnerships ahead. We have seen M&A activity pick up recently as multiples hover at more reasonable levels compared to recent years, and we expect to see more of this throughout 2024. Some recent financing rounds have been surprising but we have also seen a number of ‘down rounds,’ implying rationalization of valuation for some private companies.

Figure 17: M&A Reaccelerating YTD



Source: J.P. Morgan, Company reports.

Recent notable announced transactions this month:

- **RPD acquisition of Noetic Cyber.** Rapid [announced](#) on July 1st that it has signed an agreement to acquire Noetic Cyber. The acquisition will add CAASM (cyber asset attack surface management) capabilities to RPD’s security solutions and will help increase visibility across an organization’s cloud and on premise security posture. We think the acquisition of Noetic Cyber makes sense as ASM has become a relatively standard feature in the market. See our [note](#) for greater detail.
- **CLBT acquisition of Cyber Technology Services.** Cellebrite [announced](#) on July 17th that it has signed a definitive agreement to acquire Cyber Technology Services (CyTech) as well as officially establish Cellebrite Federal Solutions to better serve the US Federal sector. The acquisition will add CyTech’s professional services business in cybersecurity, forensics and incident response to the company’s new unit, Cellebrite Federal Solutions, expanding the company’s partnerships with US Federal customers and accelerating the company’s ability to participate in certain types of business, such as classified government business. See our [note](#) for greater detail.

Figure 18: Security Software M&A

July 2024

Target	Acquirer / Lead	Target Sector	Buyer Type	Enterprise Value (\$M)	Date
Protect AI	SydeLabs	GenAI Security	Strategic		7/31/2024
Code42	Mimecast	Data Security	Strategic		7/24/2024
Aspectra AG	Convotis GmbH	Application Security	Strategic		7/18/2024
OnSolve	GardaWorld	Event Management	Strategic		7/17/2024
Emagined Security	Neovera	SOC security	Strategic		7/17/2024
Cyber Technology Services	Cellebrite	Security Services	Strategic		7/17/2024
Polarity	ThreatConnect	Security Risk Assessment & Management	Strategic		7/9/2024
Wallet Guard	Consensus	Web3 Security	Strategic		7/3/2024
Secure Enterprise Engineering	SIXGEN	Managed Security Services	Strategic		7/2/2024
Noetic Cyber	Rapid7	CAASM	Strategic		7/1/2024

Source: Company reports, J.P. Morgan.

Recent Partnership Activity

- [IBM and Microsoft enhance cybersecurity collaboration.](#) IBM and Microsoft will enhance their collaboration to simplify and modernize cybersecurity across cloud and data security.
- [KDDI Selects Fortinet for New Global Managed SASE Service.](#) KDDI, a Japan-based global ICT services provider, will leverage Fortinet’s Unified SASE for its Global SASE Platform Service.
- [Ooredoo partners with Qatar Airways, Fortinet for cutting-edge cloud cybersecurity.](#) Ooredoo, a Qatari telecom company, partnered with Qatar Airways and Fortinet to develop security solutions for multi-cloud environments.
- [StarLink Announces Distribution Agreement with Zscaler to Advance Zero Trust Security Solutions.](#) StarLink, a cybersecurity distributor in the MEA region, will partner with Zscaler.
- [Globe Business taps Zscaler to combat rising cyber threats.](#) Globe Business, a unit of Globe Telecom, will partner with Zscaler to enhance data protection for enterprises.
- [Check Point Software Technologies pairs up with Logix InfoSecurity for MSSP partner agreement for enhanced email security.](#) Check Point partners with Logix InfoSecurity for email and productivity applications protection.
- [DPD Czech Reduces Third-party Access Risk In Record Time with CyberArk.](#) DPD Czech, a delivery company in Czech Republic, implemented the CyberArk Identity Security Platform for secure identity access management.
- [DCB Bank Delivers Secure Services to Customers with CyberArk.](#) DCB Bank, a leading Indian bank, has selected CyberArk for its identity security offering.
- [SentinelOne Partners with CISA to Enable Government-Wide Cyber Defense.](#) SentinelOne partners with Cybersecurity and Infrastructure Agency to provide security to government IT assets and critical infrastructure.
- [SentinelOne and Aon Collaborate to Enhance Strategic Cyber Services for Insureds.](#) Aon, a global professional service firm, will leverage SentinelOne’s Singularity Platform to help gather internal security data.

Notable Events Coming Up

Figure 19: Upcoming Notable Events

Event	Upcoming Dates	Location
Black Hat USA	8/3-8/8/24	Las Vegas, NV
DefCon	8/8-8/11/24	Las Vegas, NV
Salt Lake City Cybersecurity Conference	8/15/24	Virtual and Salt Lake City, Utah
JPM Summer Series: Security Software Webinar	8/20/24	Virtual
DFIR Summit & Training 2024	8/22-8/29/24	Virtual and Salt Lake City, Utah
DAFITC 2024	8/26-8/28/24	Montgomery, AL
Philadelphia Cybersecurity Conference	8/29/24	Philadelphia, Pennsylvania
GoSec 24	9/11-9/12/24	Montreal, Canada
CrowdStrike Fal.Con	9/16-9/19/24	Las Vegas, NV
JPM US All Stars Conference	9/17-9/18/24	London, UK
Mandiant WISE	9/18-9/19/24	Denver, CO
Gartner Security & Risk Management Summit	9/23-9/25/24	London, UK
Gartner CIO & IT Executive Conference	9/23-9/25/24	Sao Paulo, Brasil
IDC Security Forum	9/26/24	Kobenhavn, Denmark
JPM Software Forum	10/8-10/9/24	Napa, CA
Okta Oktane	10/16/24	Las Vegas, NV
SINET	10/16/24	New York, NY
JPM Equity Opportunities Forum	11/13-11/14/24	Miami Beach, FL
Fortinet Analyst Day	11/18/24	New York, NY
SentinelOne Onecon (TBD)	November	TBD
AWS re:Invent	12/2-12/6/24	Las Vegas, NV
Black Hat Europe	12/9-12/12/24	London, UK

Source: J.P. Morgan.

Latest 8ks: Cybersecurity Incidents

In December 2023, the SEC's rule, requiring disclosure of material cybersecurity incidents through the filing of Form 8-K, became effective. Below are the incidents and 8ks filed over the past month, and whether the company believes it may have a material impact on the company.

Figure 20: Latest Disclosed Cybersecurity Incidents

8-Ks filed July 2024

Company	Filed	Time of Incident	Expected Impact
Affirm	7/01/2024	Jun-24	Non-material
HealthEquity	7/04/2024	1H24	Non-material
Sonic Automotive	7/05/2024	Jun-24	Material impact on 2Q24 earnings
AT&T	7/12/2024	Apr-24	Non-material
AutoNation	7/15/2024	Jun-24	EPS for 2Q24 earnings: -\$1.5/share
Repligen	7/15/2024	Jul-24	Non-material
Bassett Furniture In	7/15/2024	Jul-24	TBD
Cadre	7/19/2024	Jul-24	TBD
Crimson Wine	7/25/2024	Jun-24	Material impact - offset by cybersecurity insurance

Source: SEC.gov

Head Count Activity

Over the past few years, public and private company layoffs have increased as a gross total and as a percentage of the total workforce (Figure 21), which we view as evidence of increased focus on operational efficiency as macro headwinds have tempered growth expectations.

7/1/24-7/30/24: Aqua Security and EverC both laid off 10% of their workforce. CyberProof had a RIF of 7%.

Figure 21: Public and Private Security Labor Reductions by Company

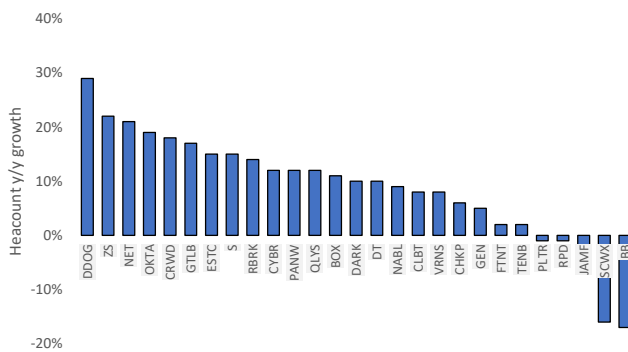
As of 7/30/24



Source: Layoffs.fyi

Figure 22: Public Security Company Head Count Growth

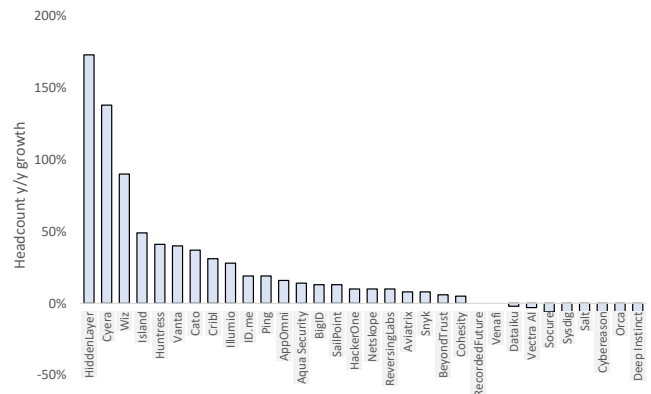
As of 7/30/24



Source: LinkedIn, J.P. Morgan

Figure 23: Private Security Company Head Count Growth

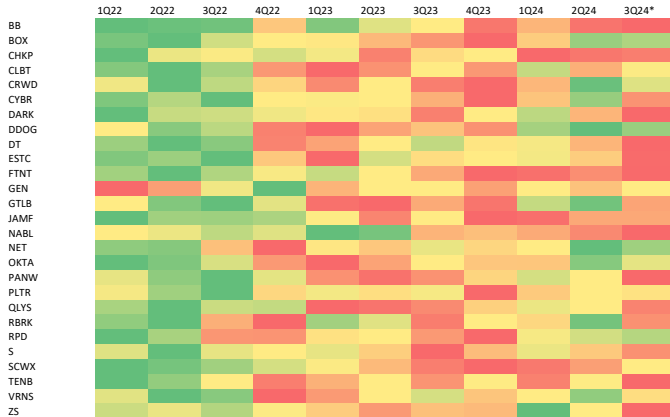
As of 7/30/24



Source: LinkedIn, J.P. Morgan

Figure 24: Employee Hiring Trends: Public Security Companies

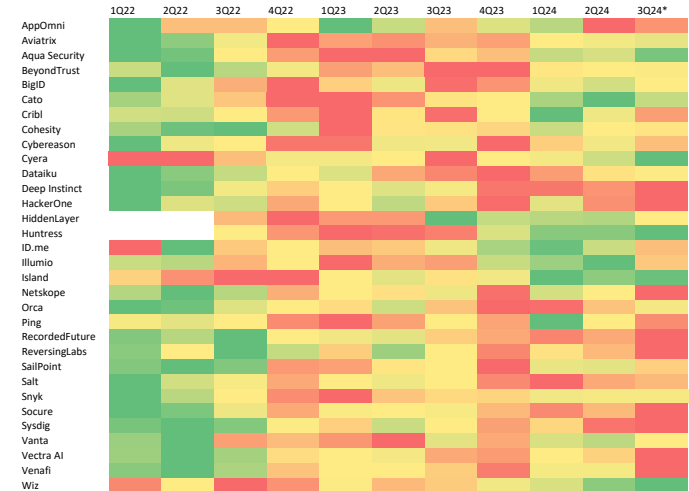
As of 7/30/24



Source: LinkedIn, J.P. Morgan
 *July data is normalized to reflect a full quarter

Figure 25: Employee Hiring Trends: Private Security Companies

As of 7/30/24



Source: LinkedIn, J.P. Morgan
 *July data is normalized to reflect a full quarter

Select Recent Industry News

07/31/24: [Microsoft says massive Azure outage was caused by DDoS attack](#) (Bleeping Computer)

Implementation of defenses against DDoS attacks amplified the massive Microsoft Azure and Microsoft 365 outage on 30th July 2024.

07/31/24: [Delta CEO says CrowdStrike-Microsoft outage cost the airline \\$500 million](#) (CNBC)

Delta canceled more than 5,000 flights in the wake of the outage, and Delta CEO Ed Bastian said the massive IT outage earlier this month that stranded thousands of customers will cost it \$500 million.

07/30/24: [CrowdStrike down after report Delta Air to seek compensation over IT outage](#) (Reuters)

Delta will reportedly seek compensation from CRWD over the recent global IT outage.

07/29/24: [Columbus says it thwarted overseas ransomware attack that caused tech shutdown](#) (The Columbus Dispatch)

The city of Columbus said that it thwarted an overseas ransomware attack that led the city to shut down much of its technology during the past 10 days.

07/29/24: [HealthEquity says data breach impacts 4.3 million people](#) (Bleeping Computer)

The Health Savings Account provider reported that the PII of 4.3mm people was compromised in a data breach on 9th March 2024.

07/29/24: [Proofpoint settings exploited to send millions of phishing emails daily](#) (Bleeping Computer)

Threat actors exploited weakness in Proofpoint and dispatched an average of 3mm spoofed emails daily to customers of Fortune 100 companies.

07/28/24: [Cyberattacks Present Shipping Industry's Biggest Threat Since WWII](#) (PYMNTS)

The shipping industry saw 64 cyberattacks last year compared to just three in 2013. More than 80% of the incidents were state-sponsored efforts from Russia, China, North Korea or Iran.

07/27/24: [Ukraine Hacks ATMs Across Russia in Ongoing Massive Cyberattack](#) (Kyiv Post)

Ministry of Defense of Ukraine launched a cyberattack on the 23rd July against Russia's banking sector disrupting ATM services.

07/26/24: [Crooks Bypassed Google's Email Verification to Create Workspace Accounts, Access 3rd-Party Services](#) (Krebs on Security)

A vulnerability in authentication process enabled threat actors to gain access to thousands of Email Verified (EV) Google Workspace accounts since late June 2024. The issue has been resolved and the attackers did not do any harm to Google services.

07/26/24: [France launches large-scale operation to fight cyber spying ahead of Olympics](#) (The Record)

French authorities launched "disinfection operation" to remove an espionage malware, PlugX, infecting at least 3000 devices in France.

07/25/24: [Data breach exposes US spyware maker behind Windows, Mac, Android and Chromebook malware](#) (TechCrunch)

Spytech, a spyware maker, has compromised at least 10,000 devices since 2013 across Windows PCs, Android devices, Macs and Chromebooks.

07/25/24: [Google Boosts Chrome Protections Against Malicious Files](#) (Security Week)

Google announced improved and automatic protection for its browser customers against malicious files.

07/25/24: [Network of 3,000 GitHub Accounts Used for Malware Distribution](#) (Security Week)

Stargazers Ghost Network, a network of over 3,000 GitHub accounts, has been operating a distribution-as-a-service (DaaS) distributing information-stealing software since July 2023. It allegedly earned over \$100,000 since the inception.

07/25/24: [North Korean Charged in Cyberattacks on US Hospitals, NASA and Military Bases](#) (Security Week)

According to the FBI, North Korea state-backed ransomware attacked 17 entities across US healthcare providers, NASA, US military bases and international entities, leading to a breach of information related to fighter aircraft, missile defense systems, satellite communications and radar systems.

07/25/24: [Nvidia Patches High-Severity Vulnerabilities in AI, Networking Products](#) (Security Week)

Nvidia released patches for vulnerabilities in its Jetson products, designed for robotics and embedded edge AI applications, and Mellanox OS and its successor Onyx, system for data centers.

07/25/24: [Secure Boot is completely broken on 200+ models from 5 big device makers](#) (ARS Technica)

Secure Boot, the tool to prevent infection of BIOS, was compromised on more than 200 models sold by Acer, Dell, Intel, and others.

07/24/24: [Activists accuse proposed UN Cybercrime Treaty of empowering surveillance, repression](#) (The Record)

The latest U.N. Cybercrime Treaty received criticism from human rights and privacy advocates. The Treaty is said to be a threat to free speech and privacy, and a tool to empower authoritarian regimes.

07/24/24: [Cellebrite Sent The FBI Unreleased Software To Crack The Trump Shooter's Phone](#) (TechDirt)

Cellebrite's Federal team assisted the FBI to decrypt the mobile of Trump's shooter.

07/24/24: [Fortune 500 firms to see \\$5.4 bln in CrowdStrike losses, says insurer Parametrix](#) (Reuters)

Recent IT outage will lead to financial losses of \$5.4bn for Fortune 500 companies, excluding Microsoft, and insurance claims to range from \$540mm to \$1.08bn, said insurer Parametrix.

07/24/24: [Meta takes down 63K romance scammer accounts](#) (Axios)

Meta removed 63,000 Nigeria based accounts involved in an financial sextortion scam targeting U.S. adults.

07/24/24: [Phone lines down in multiple courts across California after ransomware attack](#) (AP News)

The Superior Court of Los Angeles suffered a ransomware attack on 19th July 2024 resulting in a loss of phone lines for 36 courthouses in the County.

07/23/24: [How Russia-Linked Malware Cut Heat to 600 Ukrainian Buildings in Deep Winter](#) (Wired)

Russia-based hackers infused malware switched off heat and hot water to hundreds of buildings in Ukraine in January 2023.

07/22/24: [BBVA opens global cybersecurity centre in Mexico](#) (Finextra)

BBVA, a spanish financial services company, announced a cybersecurity center in Mexico in alliance with Telefonica Tech to bolster its security posture.

07/22/24: [FCC, Tracfone Wireless reach \\$16M cyber and privacy settlement](#) (Cyber Scoop)

The FCC directed Tracfone, the prepaid phone provider, to secure their APIs after the compromise of customers' sensitive information in a breach between January 2021 and 2023. The company will pay the FCC \$16mm in penalty.

07/22/24: [Quantum Leap: Advanced Computing Is a Vulnerable Cyber Target](#) (Dark Reading)

Vulnerabilities to quantum computing systems are similar to those of current classic computing systems, according to the latest research by Transilvania Quantum, creator of open source quantum computing platform Uranium, and

Bitdefender.

07/22/24: [Safety Equipment Giant Cadre Holdings Hit by Cyberattack](#) (Security Week)

Cadre ,a safety and survivability equipment company, was hit by a cyberattack on 15 July 2024.

07/22/24: [Threat Hunting Market Worth \\$6.9B by 2029](#) (Dark Reading)

Threat hunting market is expected to grow from \$3.4bn to \$6.9bn by 2029.

07/22/24: [U-M cyberattack compromised Michigan Medicine patient data of 56,000 people](#) (Detroit Free Press)

Personal and medical information of more than 56,000 people was compromised in a break in May at Michigan Medicine, the academic medical center of the University of Michigan.

07/20/24: [SBA Announces \\$3M in Grants to Improve Cybersecurity for Small Businesses](#) (Small Business Trends)

The US Small Business Administration announced \$3mm in grants in the latest round of its Cybersecurity for Small Businesses Pilot Program.

07/19/24: [Lawmakers propose healthcare cybersecurity bill to tackle growing threats](#) (Quartz)

The Healthcare Cybersecurity Act, a bipartisan bill introduced in the US, requires the CISA and Department of Health and Human Services (HHS) to work together to improve the industry's security posture,

07/19/24: [Russia, China Sell Cyber Weapons to Hamas, Cybersecurity Expert Claims](#) (News Week)

Hamas allegedly acquired sophisticated criminal malware from Russia, China, or Iran to conduct state-sponsored espionage on Israeli Defense Forces and other government agencies.

07/19/24: [US sanctions alleged Russian hackers who claimed attacks on US water facilities](#) (CNN)

The US sanctioned two members of a Russia based hacker CARR for attacks against US water facilities in January 2024.

07/18/24: [Most SEC charges dismissed in SolarWinds hack case](#) (Axios)

Charges related to inaccurate and misleading statements by SolarWinds in its IPO registration were dismissed by the US district court.

07/18/24: [UK national blood stocks in 'very fragile' state following ransomware attack](#) (The Record)

Ransomware attack on Synnovis, a pathology services provider, caused significant risk to the supply of blood affecting clinical care. The attack also led to postponement of 1,400 surgeries and 6,000 appointments.

07/18/24: [WazirX halts withdrawals after losing \\$230 million, nearly half its reserves](#) (TechCrunch)

WazirX, an Indian crypto exchange, lost \$230mm, almost half of its reserves, in a cyberattack.

07/17/24: [Change Healthcare's Breach Costs Could Reach \\$2.5 Billion](#) (GovInfo Security)

UnitedHealth, parent company of Change Healthcare, noted that costs related to ransomware attack on its subsidiary are likely to hit \$2.45bn. The costs already totaled \$1.98bn as of 30 June 2024.

07/17/24: [Interpol Arrests 300 People in a Global Crackdown on West African Crime Groups Across 5 Continents](#) (Security Week)

Interpol, during operation Jackal III, arrested 300 people, seized \$3mm and blocked 720 bank accounts related to online financial fraud by the West African organized crime groups.

07/17/24: [Iran's MuddyWater phishes Israeli orgs with custom BugSleep backdoor](#) (The Register)

Iran's state-backed cyber espionage crew, MuddyWater, has conducted multiple phishing attacks on Israeli organizations.

07/17/24: [MNGI Digestive Health Data Breach Impacts 765,000 Individuals](#) (Security Week)

The healthcare provider reported a data breach on 20 August 2023, compromising PII of over 765,000 individuals.

07/17/24: [Over 400,000 Life360 user phone numbers leaked via unsecured API](#) (Bleeping Computer)

Life360, a location services provider, suffered a data breach that compromised personal information of over 400,000 customers, due to an unsecured API endpoint.

07/17/24: [Ransomware Attack Disrupts Bassett Furniture Manufacturing Facilities](#) (Security Week)

The furniture manufacturer and retailer suffered a ransomware attack on 10 July 2024. The company believes no personal information of consumers was compromised.

07/17/24: [Ransomware attacks are hitting energy, oil and gas sectors especially hard, report finds](#) (Cyber Scoop)

Sophos, a british software company, noted in a report that more than half of energy, oil and gas, and utilities are taking longer to recover from ransomware attacks in 2023, up from 19% in 2022.

07/17/24: [Rite Aid Says Hack Impacts 2.2M People as Ransomware Gang Threatens to Leak Data](#) (Security Week)

Rite Aid suffered a data breach in June, compromising information of 2.2 million of its customers.

07/17/24: [Senators seek answers from AT&T in massive hacking of US customer call data](#) (Reuters)

Senators asked AT&T to answer questions relating to the data breach suffered in April 2024 that compromised the PII of 109mm accounts.

07/16/24: [Kaspersky to shut down US operations, lay off employees after US government ban](#) (TechCrunch)

Kaspersky, the Russian cybersecurity giant, announced the gradual shutdown of its US operations after a ban on sale of the company's software by the Commerce Department, effective 20 July 2024.

07/16/24: [Microsoft Purview Data Governance will be generally available September 1, 2024](#) (Microsoft Blog)

Microsoft announced general availability from 1 September 2024 of its AI-powered data management and access solution. The solution will have Copilot capabilities, tight integration with Fabric, and a broader partner network.

07/16/24: [NATO to Establish New Cyber Center in Belgium](#) (Security Week)

NATO announced the NATO Integrated Cyber Defense Center (NICC) to inform NATO military commanders on possible threats and vulnerabilities in cyberspace, including privately-owned civilian critical infrastructure.

07/15/24: [AT&T Breach Linked to American Hacker, Telecom Giant Paid \\$370k Ransom: Reports](#) (Security Week)

AT&T paid \$370,000 in ransom to a member of the hacker group, ShinyHunters, in May 2024 through 5.7 bitcoins.

07/15/24: [Internal Disney Communications Leaked Online After Hack](#) (WSJ)

Data from Disney's internal Slack, dating back to at least 2019, has been leaked online. The data includes discussions about ad campaigns, software development and leadership programs.

07/15/24: [Researchers: Weak Security Defaults Enabled Squarespace Domains Hijacks](#) (Krebs on Security)

Dozen of domain names registered with Squarespace suffered a breach between 9 July and 12 July 2024.

07/12/24: [EU's AI Act gets published in bloc's Official Journal, starting clock on legal deadlines](#) (TechCrunch)

The EU AI Act, the European Union's flagship regulation for AI, has officially been published, with the new law coming into force by mid 2026. The framework puts different obligations on AI developers that will have to now weigh both potential use cases and perceived risks.

07/12/24: [Unprecedented: Cloud Giants, Feds Team on Unified Security Intelligence](#) (Dark Reading)

The Cloud Safe Task Force (CSTF) partnered with the top five US cloud companies to create National Cyber Feed Initiative. The initiative aims to continuously monitor the security posture of government's cloud infrastructure.

07/11/24: [Companies Sharply Criticize Draft U.S. Cyber Reporting Rules](#) (WSJ)

Industry lobby groups in the US expressed concerns over the latest rules from CISA regarding cyber incidents, citing that they are confusing, burdensome and often duplicate existing rules.

07/11/24: [How did the auto dealer outage end? CDK almost certainly paid a \\$25 million ransom](#) (CNN Business)

CDK Global, a provider of software to car dealers in the US, paid almost \$25mm through 387 bitcoins on 21 June 2024 to settle the cyberattack suffered in mid-June 2024.

07/11/24: [Microsoft's Partnership With Middle East AI Firm Under Scrutiny](#) (Dark Reading)

Microsoft's collaboration with Group42, an UAE-based AI company, has come under scrutiny over its ties with China. The US looks to safeguard its AI technology from misuse by China and Russia.

07/10/24: [SaaS Security in Europe: A Report Card](#) (Infosecurity Magazine)

More than 70% of security professionals in Europe see SaaS security as a moderate to high priority with 57% of enterprises establishing dedicated SaaS security teams and 26% of European enterprises increasing their SaaS security budget.

07/09/24: [Australia's cybersecurity agency says China-backed hackers behind online crimes](#) (NBC News)

Australia's Cyber Security Centre accused a China's Ministry of State Security-backed group of cyber attacks on Australian networks in 2022.

07/09/24: [Exclusive Networks Confirms Receipt of a Non-Binding Indication of Interest From a Consortium of Investors Led by CD&R and Permira](#) (Press Release)

Exclusive Networks, a specialist cybersecurity distributor, received a non-binding offer from Clayton Dublier & Rice (CD&R), in consortium with Permira, for a consideration of €24.25/share implying €2.2bn equity valuation.

07/09/24: [Financial Services Key Target as Cyberattacks Surge: Report](#) (Financial Advisor IQ)

Almost a quarter of cyberattacks were targeted at financial services firm during the first quarter CY24, according to a report from BlackBerry.

07/09/24: [Microsoft's cybersecurity dilemma: An open letter to Satya Nadella](#) (Help Net Security)

The letter notes Microsoft's inadequate response at times of cyberattacks and need to bring in right leadership to fix the growing security risks at the company.

07/09/24: [US Justice Department says it disrupted Russian social media influence operation](#) (Reuters)

The US Justice Department seized two domain names and nearly 1000 social media accounts involved in an AI-enhanced Russian disinformation operation.

07/09/24: [Why Microsoft has asked employees in China to stop Android phones and only use iPhones at office](#) (Times of India)

Microsoft set to restrict corporate access from Android-powered devices in China as a part of its Secure Future Initiative to standardize employee cybersecurity practices.

07/08/24: [Artificial Intelligence Boom Lifts Paychecks for CIOs](#) (WSJ)

The boom in AI has led to an increase in compensation for CIOs and CTOs, which are now up by more than 20% since 2019. Additionally, more than half of US-based CIOs now report directly to CEOs.

07/08/24: [Mandiant Highlights Russian and Chinese Cyber Threats to NATO on Eve of 75th Anniversary Summit](#) (Security Week)

Google's Mandiant highlighted intelligence, disinformation, and disruptive cyberattacks from Russian and Chinese state-backed actors during the 75th NATO Anniversary Summit.

07/08/24: [Supreme Court Ruling Threatens the Framework of Cybersecurity Regulation](#) (Security Week)

Determination and enforcement of the US cybersecurity regulations are now subject to independent judgement of the courts after the Supreme Court overruled the Chevron Doctrine.

07/06/24: [Russian-Linked Cybercampaigns put a Bull's-Eye on France. Their Focus? The Olympics and Elections](#) (Security Week)

Russia has intensified cyberattack efforts towards France centered around French legislative elections and the Paris Olympics 2024.

07/05/24: [EU Opens Applications for Cybersecurity and Digital Skills Funding](#) (Infosecurity Magazine)

The European Union opened applications for the latest funding round of its Digital Europe Programme (DEP). The funds will be used for deployment of state-of-the-art cybersecurity technologies and tools, and delivery of higher degree education in key digital technology areas.

07/04/24: [California Advances Unique Safety Regulations for AI Companies Despite Tech Firm opposition](#) (Security Week)

California voted to advance legislation requiring AI developers to test their systems and add safety measures to prevent malicious uses.

07/04/24: [Twilio Confirms Data Breach After Hackers Leak 33M Authy User Phone Numbers](#) (Security Week)

Twilio suffered a data breach from an unauthenticated endpoint, leading to 33mm phone numbers being compromised.

07/04/24: [US lending support to help fend off cyber, disinformation attacks on Paris Olympics](#) (Politico)

CISA and other branches of the US administration are working with France to provide cybersecurity support for critical infrastructure during the Summer Olympics 2024.

07/03/24: [First round of French election: party attacks and a modest traffic dip](#) (Cloudflare Blog)

Three French political parties experienced multiple DDoS attacks in the first round of legislative elections in France.

07/02/24: [Affirm fears customer info pilfered during ransomware raid at Evolve Bank](#) (The Register)

Buy-now-pay-later firm Affirm believes that personal information of Affirm Card holders has been compromised in a recent cyber attack on Evolve Bank & Trust, the banking-as-a-service provider.

07/01/24: [Cyber insurance rates fall as businesses improve security, report says](#) (Reuters)

Improvement in security posture and rising appetite of insurers has led to double-digit price reductions in cyber insurance in 2023-24.

Private Company News

07/29/24: [Cato Networks Surpasses \\$200 Million, Doubles ARR in Under Two Years](#) (Press Release)

Cato Networks, the creator of SASE, has surpassed \$200mm in annual recurring revenue (ARR) in 2Q24, doubling its ARR in under two years. It was named a leader in the 2024 Gartner Magic Quadrant for Single-Vendor SASE.

07/25/24: [Chainguard Raises \\$140 Million, Expands Tech to Secure AI Workloads](#) (Security Week)

Chainguard, a software supply chain security startup, has raised \$140mm in a Series C round of funding led by Redpoint Ventures, Lightspeed Venture Partners, and IVP. The funds will be used for market expansion including the US public market and product development.

07/24/24: [Dazz Secures \\$50 Million to Accelerate AI-Powered Cloud Security Remediation](#) (TechCrunch)

Dazz, a leader in unified security remediation, has raised \$50mm in its latest funding round co-led by Greylock Ventures with participation from Cyberstarts, Insight Partners and Index Ventures.

07/24/24: [Vanta Raises \\$150 Million Series C Funding to Fuel Enterprise Expansion and AI Innovation](#) (Business Wire)

Vanta, the leading trust management platform, has raised \$150mm in a Series C funding round led by Sequoia Capital, Growth Equity at Goldman Sachs Alternatives, J.P. Morgan, and existing investors. The funds will be used for global market penetration, product innovation, and to increase upmarket momentum.

07/22/24: [Enveil Wins Army Linchpin Contract to Deliver Secure AI](#) (Press Release)

Enveil, focused on Privacy Enhancing Technology (PET) and securing Data in Use, is one of the two companies selected by the US Army to provide Secure AI capabilities for the army's initiative Project Linchpin.

07/22/24: [Linx emerges from stealth with \\$33M to lock down the new security perimeter: Identity](#) (TechCrunch)

Linx, a Identity management focused startup, has raised \$33mm co-led by Index Ventures and Cyberstarts.

07/17/24: [Kandji Raises \\$100 Million in Funding to Advance Apple in the Enterprise](#) (Press Release)

Kandji, focused on endpoint security of Apple devices, has raised \$100mm in capital from General Catalyst. The funds will be used for product innovation and engineering, and investments in sales & marketing.

07/17/24: [Neovera acquires Emagined Security to strengthen cybersecurity services](#) (Silicon Angle)

Neovera, a managed IT services provider, acquired Emagined Security Inc., a cybersecurity company focused on Managed Detection and Response, for an undisclosed sum.

07/17/24: [Pindrop Security Raises \\$100 Million to Expand Deepfake Detection Technology](#) (Security Week)

Pindrop Security, a voice fraud detection specialist, has raised \$100mm in debt financing from Hercules Capital. The funds will be used for product development and innovation to counter the expanding threat of AI-generated voice deepfakes.

07/15/24: [IoT Security Firm Exein Raises \\$16.3 Million](#) (Security Week)

Exein, an IoT-embedded cybersecurity firm, has raised \$16.3mm in Series B funding led by 33N. The company will use the funds to expand across Europe, the US, and Asia and double its employee base.

07/10/24: [Cytactic Raises \\$16 Million Seed Funding Round Led by Evolution Equity Partners](#) (Business Wire)

Cytactic, a cyber crisis response management and recovery platform, has raised \$16mm in its seed round, led by Evolution Equity Partners. The funds will be used to help the platform continue to scale, as well as expand the company's partnerships.

07/02/24: [Odaseva Raises \\$54M Series C Round to Expand Product Offerings and Continue Category Leadership](#)(Dark Reading)

Odaseva, the Salesforce data security platform, raised \$54mm in its Series C round, led by Silver Laker Waterman. With this latest investment, Odaseva has raised \$93.23mm to date. This latest stage of funding will help accelerate product development and investment into deepening its global reach, as well as continue to hire top talent at the executive level.

Recent Webinars

07/17/24: [REPLAY | Securing AI: Cybersecurity Insight Call with HiddenLayer](#)

Recent Research

07/30/24: [Varonis: Beat and Raise With Another Strong Quarter of Transition Progress](#)

07/29/24: [CrowdStrike: Delivering a Master Class on Incident Response; Remain Overweight, Adjusting Price Target to \\$330, Removing from AFL](#)

07/26/24: [Security Software Earnings Preview: 2Q24 Previews: TENB and VRNS](#)

07/25/24: [International Business Machines: Software & Infrastructure Driven Beat Offset by Consulting Headwinds](#)

07/24/24: [Check Point Software: Better Billings Growth Offset by Elevated Opex, New CEO Appointed](#)

07/24/24: [Security Software: Read-Through From Exclusive Networks' 2Q24 Results](#)

07/24/24: [Security Software: Read-Through From Exclusive Networks' 2Q24 Results](#)

07/24/24: [Check Point Software: 2Q24 First Take](#)

07/22/24: [Security Software Meeting Takeaways: Insights into Securing AI with HiddenLayer](#)

07/21/24: [International Business Machines: Preview: Expecting Healthy Software Growth Offset by Consulting and Infrastructure Headwinds](#)

07/19/24: [CrowdStrike: Outage Disruptive But A Long-Term Buying Opportunity](#)

07/19/24: [CrowdStrike: Outage Disruptive But A Long-Term Buying Opportunity](#)

07/18/24: [Check Point Software: Earnings Preview: Waiting For Meaningful Fundamental Improvement](#)

07/17/24: [Cellebrite: Leaning into US Federal Business](#)

07/16/24: [Security Software: Market Share Data Highlights Endpoint Strength for CRWD, S, and PANW](#)

07/14/24: [Security Software: WSJ Reports Google in Talks to Acquire Wiz](#)

07/10/24: [Rapid7: Preliminary 2Q24 ARR & Management Changes Announced](#)

07/07/24: [Security Software: MSFT SSE Now Generally Available](#)

07/03/24: [Software Landscape Biweekly Benchmarking](#)

07/02/24: [CS Disco: Challenging Setup for a Turnaround with Multiple Headwinds Ahead, Downgrade to Underweight](#)

07/02/24: [Rapid7: Expanding Into ASM with Noetic Cyber Acquisition](#)

Analyst Certification: The Research Analyst(s) denoted by an “AC” on the cover of this report certifies (or, where multiple Research Analysts are primarily responsible for this report, the Research Analyst denoted by an “AC” on the cover or within the document individually certifies, with respect to each security or issuer that the Research Analyst covers in this research) that: (1) all of the views expressed in this report accurately reflect the Research Analyst’s personal views about any and all of the subject securities or issuers; and (2) no part of any of the Research Analyst’s compensation was, is, or will be directly or indirectly related to the specific recommendations or views expressed by the Research Analyst(s) in this report. For all Korea-based Research Analysts listed on the front cover, if applicable, they also certify, as per KOFIA requirements, that the Research Analyst’s analysis was made in good faith and that the views reflect the Research Analyst’s own opinion, without undue influence or intervention.

All authors named within this report are Research Analysts who produce independent research unless otherwise specified. In Europe, Sector Specialists (Sales and Trading) may be shown on this report as contacts but are not authors of the report or part of the Research Department.

Important Disclosures

Company-Specific Disclosures: Important disclosures, including price charts and credit opinion history tables, are available for compendium reports and all J.P. Morgan–covered companies, and certain non-covered companies, by visiting <https://www.jpmm.com/research/disclosures>, calling 1-800-477-0406, or e-mailing research.disclosure.inquiries@jpmorgan.com with your request.

Explanation of Equity Research Ratings, Designations and Analyst(s) Coverage Universe:

J.P. Morgan uses the following rating system: Overweight (over the duration of the price target indicated in this report, we expect this stock will outperform the average total return of the stocks in the Research Analyst’s, or the Research Analyst’s team’s, coverage universe); Neutral (over the duration of the price target indicated in this report, we expect this stock will perform in line with the average total return of the stocks in the Research Analyst’s, or the Research Analyst’s team’s, coverage universe); and Underweight (over the duration of the price target indicated in this report, we expect this stock will underperform the average total return of the stocks in the Research Analyst’s, or the Research Analyst’s team’s, coverage universe. NR is Not Rated. In this case, J.P. Morgan has removed the rating and, if applicable, the price target, for this stock because of either a lack of a sufficient fundamental basis or for legal, regulatory or policy reasons. The previous rating and, if applicable, the price target, no longer should be relied upon. An NR designation is not a recommendation or a rating. In our Asia (ex-Australia and ex-India) and U.K. small- and mid-cap Equity Research, each stock’s expected total return is compared to the expected total return of a benchmark country market index, not to those Research Analysts’ coverage universe. If it does not appear in the Important Disclosures section of this report, the certifying Research Analyst’s coverage universe can be found on J.P. Morgan’s Research website, <https://www.jpmorganmarkets.com>.

Coverage Universe: Essex, Brian: CS Disco (LAW), Cellebrite (CLBT), Check Point Software (CHKP), CrowdStrike (CRWD), CyberArk (CYBR), Fortinet (FTNT), International Business Machines (IBM), N-able (NABL), Okta (OKTA), Palo Alto Networks (PANW), Qualys (QLYS), Rapid7 (RPD), SentinelOne (S), Tenable (TENB), Varonis (VRNS), Zscaler (ZS)

J.P. Morgan Equity Research Ratings Distribution, as of July 06, 2024

	Overweight (buy)	Neutral (hold)	Underweight (sell)
J.P. Morgan Global Equity Research Coverage*	49%	38%	13%
IB clients**	49%	46%	34%
JPMS Equity Research Coverage*	48%	41%	11%
IB clients**	69%	66%	50%

*Please note that the percentages may not add to 100% because of rounding.

**Percentage of subject companies within each of the "buy," "hold" and "sell" categories for which J.P. Morgan has provided investment banking services within the previous 12 months.

For purposes of FINRA ratings distribution rules only, our Overweight rating falls into a buy rating category; our Neutral rating falls into a hold rating category; and our Underweight rating falls into a sell rating category. Please note that stocks with an NR designation are not included in the table above. This information is current as of the end of the most recent calendar quarter.

Equity Valuation and Risks: For valuation methodology and risks associated with covered companies or price targets for covered companies, please see the most recent company-specific research report at <http://www.jpmorganmarkets.com>, contact the primary analyst or your J.P. Morgan representative, or email research.disclosure.inquiries@jpmorgan.com. For material information about the proprietary models used, please see the Summary of Financials in company-specific research reports and the Company Tearsheets, which are available to download on the company pages of our client website, <http://www.jpmorganmarkets.com>. This report also sets out within it the material underlying assumptions used.

A history of J.P. Morgan investment recommendations disseminated during the preceding 12 months can be accessed on the Research & Commentary page of <http://www.jpmorganmarkets.com> where you can also search by analyst name, sector or financial instrument.

Analysts' Compensation: The research analysts responsible for the preparation of this report receive compensation based upon various factors, including the quality and accuracy of research, client feedback, competitive factors, and overall firm revenues.

Registration of non-US Analysts: Unless otherwise noted, the non-US analysts listed on the front of this report are employees of non-US affiliates of J.P. Morgan Securities LLC, may not be registered as research analysts under FINRA rules, may not be associated persons of J.P. Morgan Securities LLC, and may not be subject to FINRA Rule 2241 or 2242 restrictions on communications with covered companies, public appearances, and trading securities held by a research analyst account.

Other Disclosures

J.P. Morgan is a marketing name for investment banking businesses of JPMorgan Chase & Co. and its subsidiaries and affiliates worldwide.

UK MIFID FICC research unbundling exemption: UK clients should refer to [UK MIFID Research Unbundling exemption](#) for details of J.P. Morgan's implementation of the FICC research exemption and guidance on relevant FICC research categorisation.

All research material made available to clients are simultaneously available on our client website, J.P. Morgan Markets, unless specifically permitted by relevant laws. Not all research content is redistributed, e-mailed or made available to third-party aggregators. For all research material available on a particular stock, please contact your sales representative.

Any long form nomenclature for references to China; Hong Kong; Taiwan; and Macau within this research material are Mainland China; Hong Kong SAR (China); Taiwan (China); and Macau SAR (China).

J.P. Morgan Research may, from time to time, write on issuers or securities targeted by economic or financial sanctions imposed or administered by the governmental authorities of the U.S., EU, UK or other relevant jurisdictions (Sanctioned Securities). Nothing in this report is intended to be read or construed as encouraging, facilitating, promoting or otherwise approving investment or dealing in such Sanctioned Securities. Clients should be aware of their own legal and compliance obligations when making investment decisions.

Any digital or crypto assets discussed in this research report are subject to a rapidly changing regulatory landscape. For relevant regulatory advisories on crypto assets, including bitcoin and ether, please see <https://www.jpmorgan.com/disclosures/cryptoasset-disclosure>.

The author(s) of this research report may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so.

Exchange-Traded Funds (ETFs): J.P. Morgan Securities LLC ("JPMS") acts as authorized participant for substantially all U.S.-listed ETFs. To the extent that any ETFs are mentioned in this report, JPMS may earn commissions and transaction-based compensation in connection with the distribution of those ETF shares and may earn fees for performing other trade-related services, such as securities lending to short sellers of the ETF shares. JPMS may also perform services for the ETFs themselves, including acting as a broker or dealer to the ETFs. In addition, affiliates of JPMS may perform services for the ETFs, including trust, custodial, administration, lending, index calculation and/or maintenance and other services.

Options and Futures related research: If the information contained herein regards options- or futures-related research, such information is available only to persons who have received the proper options or futures risk disclosure documents. Please contact your J.P. Morgan Representative or visit <https://www.theocc.com/components/docs/riskstoc.pdf> for a copy of the Option Clearing Corporation's Characteristics and Risks of Standardized Options or http://www.finra.org/sites/default/files/Security_Futures_Risk_Disclosure_Statement_2018.pdf for a copy of the Security Futures Risk Disclosure Statement.

Changes to Interbank Offered Rates (IBORs) and other benchmark rates: Certain interest rate benchmarks are, or may in the future become, subject to ongoing international, national and other regulatory guidance, reform and proposals for reform. For more information, please consult: https://www.jpmorgan.com/global/disclosures/interbank_offered_rates

Private Bank Clients: Where you are receiving research as a client of the private banking businesses offered by JPMorgan Chase & Co. and its subsidiaries ("J.P. Morgan Private Bank"), research is provided to you by J.P. Morgan Private Bank and not by any other division of J.P. Morgan, including, but not limited to, the J.P. Morgan Corporate and Investment Bank and its Global Research division.

Legal entity responsible for the production and distribution of research: The legal entity identified below the name of the Reg AC Research Analyst who authored this material is the legal entity responsible for the production of this research. Where multiple Reg AC Research Analysts authored this material with different legal entities identified below their names, these legal entities are jointly responsible for the production of this research. Research Analysts from various J.P. Morgan affiliates may have contributed to the production of this material but may not be licensed to carry out regulated activities in your jurisdiction (and do not hold themselves out as being able to do so). Unless otherwise stated below, this material has been distributed by the legal entity responsible for production. If you have any queries, please contact the relevant Research Analyst in your jurisdiction or the entity in your jurisdiction that has distributed this research material.

Legal Entities Disclosures and Country-/Region-Specific Disclosures:

Argentina: JPMorgan Chase Bank N.A Sucursal Buenos Aires is regulated by Banco Central de la República Argentina ("BCRA"- Central Bank of Argentina) and Comisión Nacional de Valores ("CNV"- Argentinian Securities Commission - ALYC y AN Integral N°51). **Australia:** J.P. Morgan Securities Australia Limited ("JPMSAL") (ABN 61 003 245 234/AFS Licence No: 238066) is regulated by the Australian Securities and Investments Commission and is a Market Participant of ASX Limited, a Clearing and Settlement Participant of ASX Clear Pty Limited and a Clearing Participant of ASX Clear (Futures) Pty Limited. This material is issued and distributed in Australia by or on behalf of

JPMorgan only to "wholesale clients" (as defined in section 761G of the Corporations Act 2001). A list of all financial products covered can be found by visiting <https://www.jpmm.com/research/disclosures>. J.P. Morgan seeks to cover companies of relevance to the domestic and international investor base across all Global Industry Classification Standard (GICS) sectors, as well as across a range of market capitalisation sizes. If applicable, in the course of conducting public side due diligence on the subject company(ies), the Research Analyst team may at times perform such diligence through corporate engagements such as site visits, discussions with company representatives, management presentations, etc. Research issued by JPMorgan has been prepared in accordance with J.P. Morgan Australia's Research Independence Policy which can be found at the following link: [J.P. Morgan Australia - Research Independence Policy](#). **Brazil:** Banco J.P. Morgan S.A. is regulated by the Comissao de Valores Mobiliarios (CVM) and by the Central Bank of Brazil. Ombudsman J.P. Morgan: 0800-7700847 / 0800-7700810 (For Hearing Impaired) / ouvidoria.jp.morgan@jpmorgan.com. **Canada:** J.P. Morgan Securities Canada Inc. is a registered investment dealer, regulated by the Canadian Investment Regulatory Organization and the Ontario Securities Commission and is the participating member on Canadian exchanges. This material is distributed in Canada by or on behalf of J.P.Morgan Securities Canada Inc. **Chile:** Inversiones J.P. Morgan Limitada is an unregulated entity incorporated in Chile. **China:** J.P. Morgan Securities (China) Company Limited has been approved by CSRC to conduct the securities investment consultancy business. **Dubai International Financial Centre (DIFC):** JPMorgan Chase Bank, N.A., Dubai Branch is regulated by the Dubai Financial Services Authority (DFSA) and its registered address is Dubai International Financial Centre - The Gate, West Wing, Level 3 and 9 PO Box 506551, Dubai, UAE. This material has been distributed by JP Morgan Chase Bank, N.A., Dubai Branch to persons regarded as professional clients or market counterparties as defined under the DFSA rules. **European Economic Area (EEA):** Unless specified to the contrary, research is distributed in the EEA by J.P. Morgan SE ("JPM SE"), which is authorised as a credit institution by the Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) and jointly supervised by the BaFin, the German Central Bank (Deutsche Bundesbank) and the European Central Bank (ECB). JPM SE is a company headquartered in Frankfurt with registered address at TaunusTurm, Taunustor 1, Frankfurt am Main, 60310, Germany. The material has been distributed in the EEA to persons regarded as professional investors (or equivalent) pursuant to Art. 4 para. 1 no. 10 and Annex II of MiFID II and its respective implementation in their home jurisdictions ("EEA professional investors"). This material must not be acted on or relied on by persons who are not EEA professional investors. Any investment or investment activity to which this material relates is only available to EEA relevant persons and will be engaged in only with EEA relevant persons. **Hong Kong:** J.P. Morgan Securities (Asia Pacific) Limited (CE number AAJ321) is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission in Hong Kong, and J.P. Morgan Broking (Hong Kong) Limited (CE number AAB027) is regulated by the Securities and Futures Commission in Hong Kong. JP Morgan Chase Bank, N.A., Hong Kong Branch (CE Number AAL996) is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission, is organized under the laws of the United States with limited liability. Where the distribution of this material is a regulated activity in Hong Kong, the material is distributed in Hong Kong by or through J.P. Morgan Securities (Asia Pacific) Limited and/or J.P. Morgan Broking (Hong Kong) Limited. **India:** J.P. Morgan India Private Limited (Corporate Identity Number - U67120MH1992FTC068724), having its registered office at J.P. Morgan Tower, Off. C.S.T. Road, Kalina, Santacruz - East, Mumbai - 400098, is registered with the Securities and Exchange Board of India (SEBI) as a 'Research Analyst' having registration number INH000001873. J.P. Morgan India Private Limited is also registered with SEBI as a member of the National Stock Exchange of India Limited and the Bombay Stock Exchange Limited (SEBI Registration Number - INZ000239730) and as a Merchant Banker (SEBI Registration Number - MB/INM000002970). Telephone: 91-22-6157 3000, Facsimile: 91-22-6157 3990 and Website: <http://www.jpmpi.com>. JPMorgan Chase Bank, N.A. - Mumbai Branch is licensed by the Reserve Bank of India (RBI) (Licence No. 53/ Licence No. BY.4/94; SEBI - IN/CUS/014/ CDSL : IN-DP-CDSL-444-2008/ IN-DP-NSDL-285-2008/ INBI00000984/ INE231311239) as a Scheduled Commercial Bank in India, which is its primary license allowing it to carry on Banking business in India and other activities, which a Bank branch in India are permitted to undertake. For non-local research material, this material is not distributed in India by J.P. Morgan India Private Limited. Compliance Officer: Spurthi Gadamsetty; spurthi.gadamsetty@jpmchase.com; +912261573225. Grievance Officer: Ramprasadh K, jpmipl.research.feedback@jpmorgan.com; +912261573000.

Investment in securities market are subject to market risks. Read all the related documents carefully before investing. Registration granted by SEBI and certification from NISM in no way guarantee performance of the intermediary or provide any assurance of returns to investors.

Indonesia: PT J.P. Morgan Sekuritas Indonesia is a member of the Indonesia Stock Exchange and is registered and supervised by the Otoritas Jasa Keuangan (OJK). **Korea:** J.P. Morgan Securities (Far East) Limited, Seoul Branch, is a member of the Korea Exchange (KRX). JPMorgan Chase Bank, N.A., Seoul Branch, is licensed as a branch office of foreign bank (JPMorgan Chase Bank, N.A.) in Korea. Both entities are regulated by the Financial Services Commission (FSC) and the Financial Supervisory Service (FSS). For non-macro research material, the material is distributed in Korea by or through J.P. Morgan Securities (Far East) Limited, Seoul Branch. **Japan:** JPMorgan Securities Japan Co., Ltd. and JPMorgan Chase Bank, N.A., Tokyo Branch are regulated by the Financial Services Agency in Japan. **Malaysia:** This material is issued and distributed in Malaysia by JPMorgan Securities (Malaysia) Sdn Bhd (18146-X), which is a Participating Organization of Bursa Malaysia Berhad and holds a Capital Markets Services License issued by the Securities Commission in Malaysia. **Mexico:** J.P. Morgan Casa de Bolsa, S.A. de C.V. and J.P. Morgan Grupo Financiero are members of the Mexican Stock Exchange and are authorized to act as a broker dealer by the National Banking and Securities Exchange Commission. **New Zealand:** This material is issued and distributed by JPMorgan in New Zealand only to "wholesale clients" (as defined in the Financial Markets Conduct Act 2013). JPMorgan is registered as a Financial Service Provider under the Financial Service providers (Registration and Dispute Resolution) Act of 2008. **Philippines:** J.P. Morgan Securities Philippines Inc. is a Trading Participant of the Philippine Stock Exchange and a member of the Securities Clearing Corporation of the Philippines and the Securities Investor Protection Fund. It is regulated by the Securities and Exchange Commission. **Singapore:** This material is issued and distributed in Singapore by or through J.P. Morgan Securities Singapore Private Limited (JMSS) [MCI (P) 030/08/2023 and Co. Reg. No.: 199405335R], which is a member of the Singapore Exchange Securities Trading Limited, and/or JPMorgan Chase Bank, N.A., Singapore branch (JPMCB Singapore), both of which are regulated by the Monetary Authority of Singapore. This material is issued and distributed in Singapore only to accredited investors, expert investors and institutional investors, as defined in Section 4A of the Securities and Futures Act, Cap. 289 (SFA).

This material is not intended to be issued or distributed to any retail investors or any other investors that do not fall into the classes of “accredited investors,” “expert investors” or “institutional investors,” as defined under Section 4A of the SFA. Recipients of this material in Singapore are to contact JPMSS or JPMCB Singapore in respect of any matters arising from, or in connection with, the material. **South Africa:** J.P. Morgan Equities South Africa Proprietary Limited and JPMorgan Chase Bank, N.A., Johannesburg Branch are members of the Johannesburg Securities Exchange and are regulated by the Financial Services Conduct Authority (FSCA). **Taiwan:** J.P. Morgan Securities (Taiwan) Limited is a participant of the Taiwan Stock Exchange (company-type) and regulated by the Taiwan Securities and Futures Bureau. Material relating to equity securities is issued and distributed in Taiwan by J.P. Morgan Securities (Taiwan) Limited, subject to the license scope and the applicable laws and the regulations in Taiwan. According to Paragraph 2, Article 7-1 of Operational Regulations Governing Securities Firms Recommending Trades in Securities to Customers (as amended or supplemented) and/or other applicable laws or regulations, please note that the recipient of this material is not permitted to engage in any activities in connection with the material that may give rise to conflicts of interests, unless otherwise disclosed in the “Important Disclosures” in this material. **Thailand:** This material is issued and distributed in Thailand by JPMorgan Securities (Thailand) Ltd., which is a member of the Stock Exchange of Thailand and is regulated by the Ministry of Finance and the Securities and Exchange Commission, and its registered address is 3rd Floor, 20 North Sathorn Road, Silom, Bangrak, Bangkok 10500. **UK:** Unless specified to the contrary, research is distributed in the UK by J.P. Morgan Securities plc (“JPMS plc”) which is a member of the London Stock Exchange and is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. JPMS plc is registered in England & Wales No. 2711006, Registered Office 25 Bank Street, London, E14 5JP. This material is directed in the UK only to: (a) persons having professional experience in matters relating to investments falling within article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) (Order) 2005 (“the FPO”); (b) persons outlined in article 49 of the FPO (high net worth companies, unincorporated associations or partnerships, the trustees of high value trusts, etc.); or (c) any persons to whom this communication may otherwise lawfully be made; all such persons being referred to as “UK relevant persons”. This material must not be acted on or relied on by persons who are not UK relevant persons. Any investment or investment activity to which this material relates is only available to UK relevant persons and will be engaged in only with UK relevant persons. Research issued by JPMS plc has been prepared in accordance with JPMS plc's policy for prevention and avoidance of conflicts of interest related to the production of Research which can be found at the following link: [J.P. Morgan EMEA - Research Independence Policy](#). **U.S.:** J.P. Morgan Securities LLC (“JPMS”) is a member of the NYSE, FINRA, SIPC, and the NFA. JPMorgan Chase Bank, N.A. is a member of the FDIC. Material published by non-U.S. affiliates is distributed in the U.S. by JPMS who accepts responsibility for its content.

General: Additional information is available upon request. The information in this material has been obtained from sources believed to be reliable. While all reasonable care has been taken to ensure that the facts stated in this material are accurate and that the forecasts, opinions and expectations contained herein are fair and reasonable, JPMorgan Chase & Co. or its affiliates and/or subsidiaries (collectively J.P. Morgan) make no representations or warranties whatsoever to the completeness or accuracy of the material provided, except with respect to any disclosures relative to J.P. Morgan and the Research Analyst's involvement with the issuer that is the subject of the material. Accordingly, no reliance should be placed on the accuracy, fairness or completeness of the information contained in this material. There may be certain discrepancies with data and/or limited content in this material as a result of calculations, adjustments, translations to different languages, and/or local regulatory restrictions, as applicable. These discrepancies should not impact the overall investment analysis, views and/or recommendations of the subject company(ies) that may be discussed in the material. J.P. Morgan accepts no liability whatsoever for any loss arising from any use of this material or its contents, and neither J.P. Morgan nor any of its respective directors, officers or employees, shall be in any way responsible for the contents hereof, apart from the liabilities and responsibilities that may be imposed on them by the relevant regulatory authority in the jurisdiction in question, or the regulatory regime thereunder. Opinions, forecasts or projections contained in this material represent J.P. Morgan's current opinions or judgment as of the date of the material only and are therefore subject to change without notice. Periodic updates may be provided on companies/industries based on company-specific developments or announcements, market conditions or any other publicly available information. There can be no assurance that future results or events will be consistent with any such opinions, forecasts or projections, which represent only one possible outcome. Furthermore, such opinions, forecasts or projections are subject to certain risks, uncertainties and assumptions that have not been verified, and future actual results or events could differ materially. The value of, or income from, any investments referred to in this material may fluctuate and/or be affected by changes in exchange rates. All pricing is indicative as of the close of market for the securities discussed, unless otherwise stated. Past performance is not indicative of future results. Accordingly, investors may receive back less than originally invested. This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument. The opinions and recommendations herein do not take into account individual client circumstances, objectives, or needs and are not intended as recommendations of particular securities, financial instruments or strategies to particular clients. This material may include views on structured securities, options, futures and other derivatives. These are complex instruments, may involve a high degree of risk and may be appropriate investments only for sophisticated investors who are capable of understanding and assuming the risks involved. The recipients of this material must make their own independent decisions regarding any securities or financial instruments mentioned herein and should seek advice from such independent financial, legal, tax or other adviser as they deem necessary. J.P. Morgan may trade as a principal on the basis of the Research Analysts' views and research, and it may also engage in transactions for its own account or for its clients' accounts in a manner inconsistent with the views taken in this material, and J.P. Morgan is under no obligation to ensure that such other communication is brought to the attention of any recipient of this material. Others within J.P. Morgan, including Strategists, Sales staff and other Research Analysts, may take views that are inconsistent with those taken in this material. Employees of J.P. Morgan not involved in the preparation of this material may have investments in the securities (or derivatives of such securities) mentioned in this material and may trade them in ways different from those discussed in this material. This material is not an advertisement for or marketing of any issuer, its products or services, or its securities in any jurisdiction.

Confidentiality and Security Notice: This transmission may contain information that is privileged, confidential, legally privileged, and/or exempt from disclosure under applicable law. If you are not the intended recipient, you are hereby notified that any disclosure, copying,

distribution, or use of the information contained herein (including any reliance thereon) is STRICTLY PROHIBITED. Although this transmission and any attachments are believed to be free of any virus or other defect that might affect any computer system into which it is received and opened, it is the responsibility of the recipient to ensure that it is virus free and no responsibility is accepted by JPMorgan Chase & Co., its subsidiaries and affiliates, as applicable, for any loss or damage arising in any way from its use. If you received this transmission in error, please immediately contact the sender and destroy the material in its entirety, whether in electronic or hard copy format. This message is subject to electronic monitoring: <https://www.jpmorgan.com/disclosures/email>

MSCI: Certain information herein (“Information”) is reproduced by permission of MSCI Inc., its affiliates and information providers (“MSCI”) ©2024. No reproduction or dissemination of the Information is permitted without an appropriate license. MSCI MAKES NO EXPRESS OR IMPLIED WARRANTIES (INCLUDING MERCHANTABILITY OR FITNESS) AS TO THE INFORMATION AND DISCLAIMS ALL LIABILITY TO THE EXTENT PERMITTED BY LAW. No Information constitutes investment advice, except for any applicable Information from MSCI ESG Research. Subject also to [msci.com/disclaimer](https://www.msci.com/disclaimer)

Sustainalytics: Certain information, data, analyses and opinions contained herein are reproduced by permission of Sustainalytics and: (1) includes the proprietary information of Sustainalytics; (2) may not be copied or redistributed except as specifically authorized; (3) do not constitute investment advice nor an endorsement of any product or project; (4) are provided solely for informational purposes; and (5) are not warranted to be complete, accurate or timely. Sustainalytics is not responsible for any trading decisions, damages or other losses related to it or its use. The use of the data is subject to conditions available at <https://www.sustainalytics.com/legal-disclaimers>. ©2024 Sustainalytics. All Rights Reserved.

"Other Disclosures" last revised July 06, 2024.

Copyright 2024 JPMorgan Chase & Co. All rights reserved. This material or any portion hereof may not be reprinted, sold or redistributed without the written consent of J.P. Morgan. It is strictly prohibited to use or share without prior written consent from J.P. Morgan any research material received from J.P. Morgan or an authorized third-party (“J.P. Morgan Data”) in any third-party artificial intelligence (“AI”) systems or models when such J.P. Morgan Data is accessible by a third-party. It is permissible to use J.P. Morgan Data for internal business purposes only in an AI system or model that protects the confidentiality of J.P. Morgan Data so as to prevent any and all access to or use of such J.P. Morgan Data by any third-party.

Completed 01 Aug 2024 02:20 AM EDT

Disseminated 01 Aug 2024 05:00 AM EDT