

## Technology

## 2H23 CIO Survey: 2024 Outlook Uplift

The 100 responses to the Barclays 2H 2023 CIO survey were submitted during September 2023 and indicate rising spend expectations in 2024 to 3.1%, though overall IT spending outlook in 2023 remains muted at 2.2%.

**CIO expectations 2023 and 2024.** Growth expectations for 2023 remained largely the same (2.2%), though initial read on 2024 outlook stronger, accelerating 90bps from latest 2023 outlook to 3.1% growth. Looking at regions, North America is the strongest with EMEA also exhibiting strength. Enterprises with budgets under \$1Bn driving the uptick in expected spend, with large enterprises (IT budgets >\$1Bn) expecting slower IT spend to 0.6% 2024 from 2.0% in 2023. We see spending acceleration across most industries, though uncertain macro could adjust expectations.

**Software Takeaways.** Like in our 1H'23 survey, results showed that BI/Analytics, ERP, and CRM remain the top 3 spending priorities for CIOs, though Communications, ITSM, and Databases all saw healthy momentum in 2H. Expectations for cloud spending once again looked positive, and the improving trends here echo the sentiment from our coverage that optimizations are beginning to find their bottom. In our view, this bodes well for Microsoft and Oracle, with both companies also benefiting from the increased need for AI compute. We also remain positive on Snowflake and MongoDB, with CIOs expecting strong spending increases over the next 12 months on both platforms. ServiceNow also stands out to us, as ITSM saw the greatest spend priority increase amongst solutions in our coverage.

**IT Services Takeaways.** As CIOs look to increase spend in FY24, we believe investment focus will re-calibrate towards digital transformation work. After a spike in interest for cost-cutting initiatives in FY23, respondents have seemingly shifted their focus to ERP/software upgrades and applying analytics, which we believe to be in preparation to capture opportunities in Generative AI. Despite an uncertain macro-backdrop, we believe IT Services vendors and enterprise clients will look to improve/optimize core systems in order to capture a return in demand. We believe **Accenture** is the best positioned in our coverage to win share due to its diverse capabilities and client base.

**IT Hardware Takeaways.** The overall outlook remained muted for 2023 though recovery expected in 2024. Servers and Communications were the only hardware verticals to see an uptick in spend expectations with PCs, Printing and Storage continuing to slide. The high level of repatriation of workloads back to the private cloud continued, though public cloud spending expectations remained mostly flat (down 1 point). Storage and Communications were most favorable overall, which aligns with our positive stance on **Pure Storage, Juniper** and **Arista**.

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**More granular detail herein.** The survey responses have been presented in original form and have not been altered. Survey results should not be attributed to Barclays. In this report though, the Barclays Technology Equity Research team offers interpretations of what these survey results could imply for the IT spending environment and for specific segments such as Software, Security, IT Hardware/Networking, Internet, IT Services and Information Services.

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## Barclays 2H 2023 CIO Survey

### Survey Methodology

The Barclays 2H 2023 CIO survey was conducted in September 2023. We reached out to 160 potential survey participants to achieve 100 responses. Of the 100 survey respondents, 73% had participated in the Barclays 1H 2023 CIO survey conducted in March ([Technology: 1H23 CIO Survey: Outlook Unchanged 04/20/23](#)); the overall response rate was 63%, down from 66% in our prior poll.

Data collection was conducted through telephone interviews. On average, the interviews ran for approximately 30 minutes. The survey respondents received advance copies of the questions to facilitate the data collection process.

92% of the survey respondents are CIOs at their respective organizations. The remaining 9% hold senior roles (i.e., job titles describing the role of Vice President or Director within IT) and are an integral part of the IT spending decision-making process.

The survey responses have been presented in original form and have not been altered. Survey results should not be attributed to Barclays. In this report though, the Barclays Technology Equity Research team offers interpretations of what these survey results could imply for the IT spending environment and for specific segments such as Software, Security, IT Hardware/Networking, Internet, IT Services, and Information Services.

### CIO Survey Results

#### Growth-related Questions

**CIO Survey – Question #1: What is the Y/Y percentage change in your company’s total IT spending level in 2023 and 2024? Please specify approximate percentage.**

Total IT spending level expectations continued to reflect a persisting conservative outlook in comparison to the survey conducted in 1H22. Average spending expectations for 2023 fell to 2.2% from the 1H23 estimate of 2.3%. The 2024 expected IT spending increase of 3.1% points to green shoots of recovery, despite the heightened caution due to macro.

**Key Take:** The expected spending levels in 2023 remain muted with difficult macro an ongoing concern. However, the increase in 2024 spending expectations point to green shoots of recovery, but likely remain conservative, given difficult macro environment. Uplift on spending expectations could result in further acceleration for expected IT spend in 2024, dependent on macro.

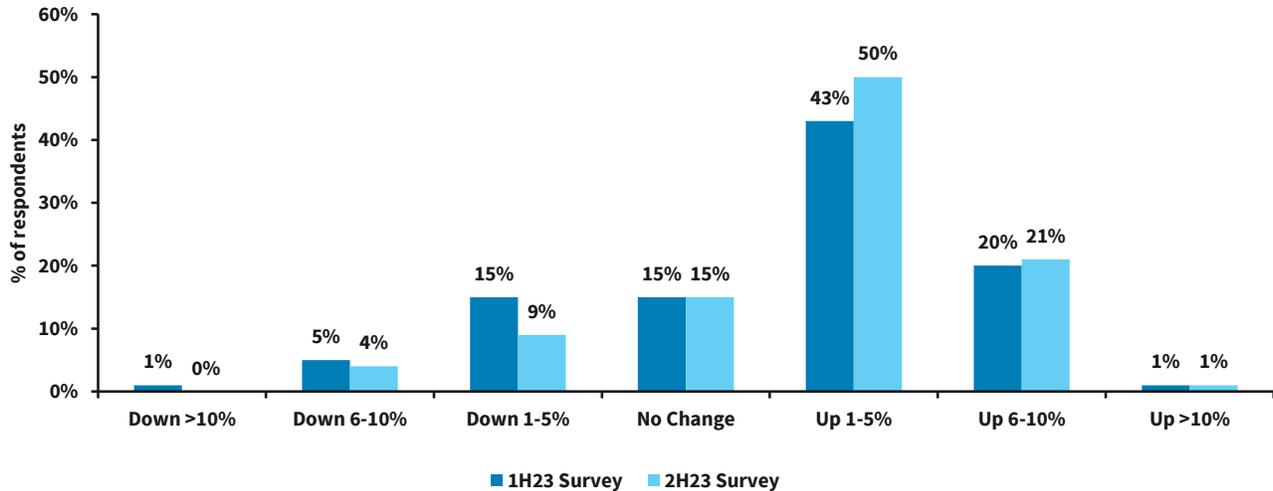
**FIGURE 1. Barclays CIO Survey – 2023E Spending Outlook Stays Muted with Expected Uptick in 2024E (Y/Y Growth % in IT spending dollars)**

	2017	2018	2019	2020	2021	2022	2023E	2024E
CIO Survey Base - Avg (2H23)							2.2%	3.1%
CIO Survey Base - Avg (1H23)						2.8%	2.3%	
CIO Survey Base - Avg (2H22)						3.6%	2.3%	
CIO Survey Base - Avg (1H22)					3.8%	4.3%		
CIO Survey Base - Avg (2H21)				(2.1%)	3.9%	3.9%		
CIO Survey Base - Avg (1H21)			4.1%	(2.8%)	3.4%			
CIO Survey Base - Avg (2H20)			4.7%	(3.1%)	2.1%			
CIO Survey Base - Avg (1H20)		5.1%	4.6%	2.4%				
CIO Survey Base - Avg (2H19)		4.6%	4.2%	3.3%				
CIO Survey Base - Avg (1H19)	4.2%	5.2%	4.6%					
CIO Survey Base - Avg (1H18)	4.9%	5.1%						
CIO Survey Base - Avg (2H17)	4.3%	4.1%						

Source: Barclays CIO Survey program.

Figure 2 presents growth expectations for 2024 in 2H23 as compared to 2023 in 1H23 expectations. 28% of respondents expect a decline or no change in 2024 spending, as opposed to the 36% surveyed in 1H23, while 72% of respondents expect growth in 2024. Although the largest percentage of respondents still indicated growth in spending would be at 1-5%, the percentage of respondents in that category increased to 50% (from 43% in the previous survey).

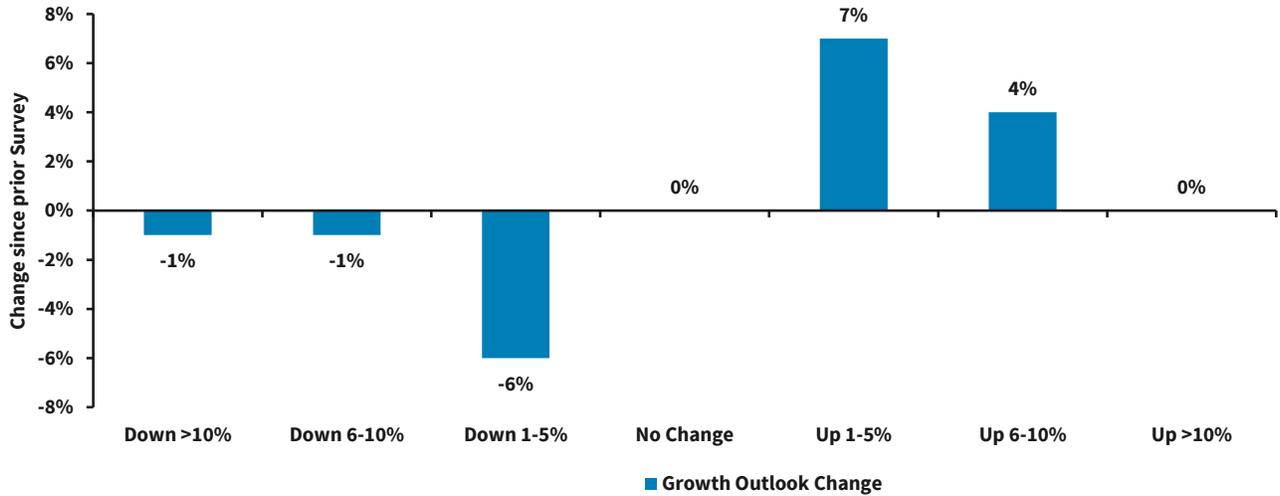
**FIGURE 2. Barclays CIO Survey – 2024 Spending Expectations Rising**



Source: Barclays CIO Survey program

Figure 3 illustrates the changes in 2024 growth expectations since the prior survey's 2023 expectations. The decline in respondents expecting a decrease in spending was redistributed to respondents expecting 1-5% growth (+7%) and 5-10% growth (+4%).

**FIGURE 3. Barclays CIO Survey – CIOs Have Revised Outlooks Upward for 2024** (% of respondents by Y/Y IT spending growth expectation, change since prior survey)



Source: Barclays CIO Survey program.

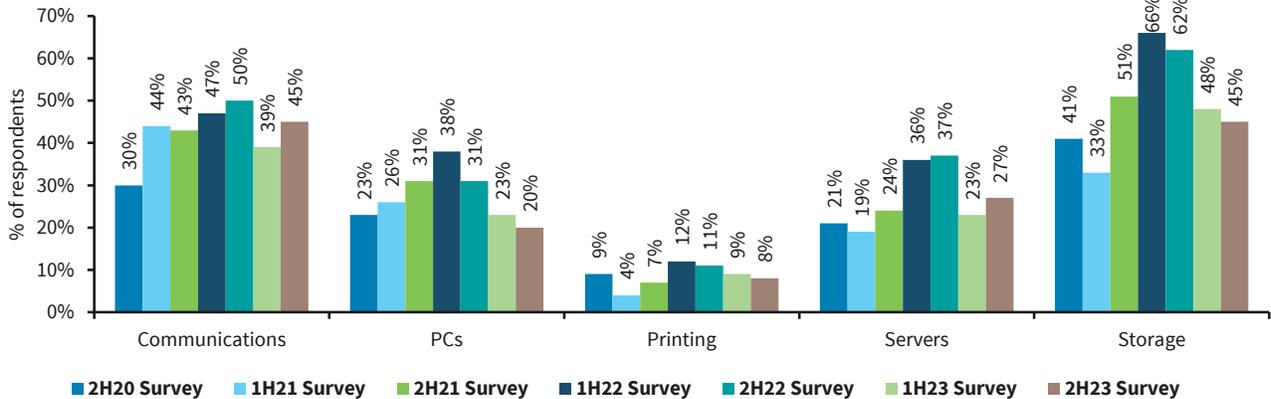
**CIO Survey – Question #2: For each category, what is the expected Y/Y percentage change in your company's spending levels in 2024?**

Question 2 considers which areas of IT hardware spending are best positioned for revenue growth in 2024; this marks our first read for the period, as our surveys prior to 2H23 had been conducted with respect to 2023.

**Key take:** Communications increased materially to 45% and Servers slightly up to 27%. Meanwhile, PCs dropped 20%, and Printing and Storage declined 8% and 45%, respectively.

Storage saw increases in 2H21 and 1H22 but fell during the past three surveys to 45%. Storage and Communications are the categories with the most positive sentiment.

**FIGURE 4. % of Respondents Expecting Increase – PC, Printing, and Storage Verticals Continue Downtick in CIO Sentiment in 2H23**



Source: Barclays CIO Survey program.

FIGURE 5. 2024 Expectation, change from Prior Survey

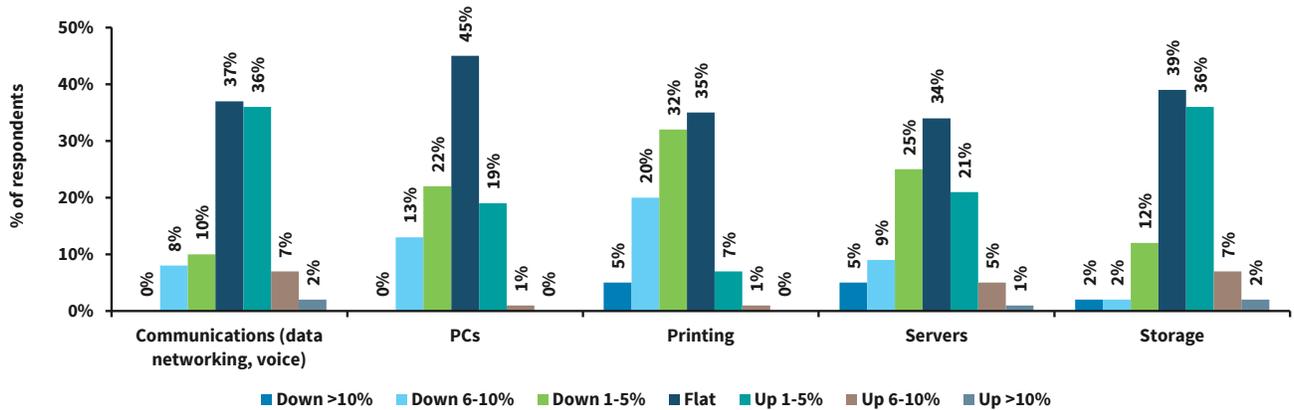
2024 Expectation, change from Prior Survey							
% of Respondents	Down >10%	Down 6-10%	Down 1-5%	Flat	Up 1-5%	Up 6-10%	Up >10%
Communications	0%	-3%	-2%	-1%	6%	-2%	2%
PCs	0%	1%	-5%	7%	0%	-3%	0%
Printing	0%	1%	-2%	2%	-2%	1%	0%
Servers	1%	4%	-6%	-3%	2%	2%	0%
Storage	0%	1%	0%	2%	-7%	4%	0%

Source: Barclays CIO Survey program.

### Hardware Trends

The most common expectation in most categories continues to be flat spending in 2024. More respondents expect a decline in 2024 vs. growth in the areas of PCs (35% vs. 20%), Printing (57% vs 8%), and Servers (39% vs 27%). 45% of respondents expect growth in Communications and 45% of respondents expect growth in Storage, both highest among product categories.

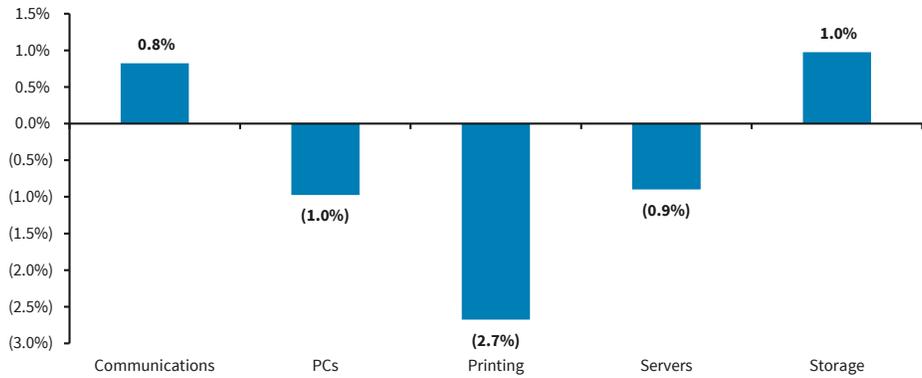
FIGURE 6. Barclays CIO Survey – Communications and Storage Appear Best-Positioned



Source: Barclays CIO Survey program.

We also calculate the weighted average growth expectations for each of the hardware categories based on the percentage of CIO responses falling in each spending growth range. As an approximation, we assign a value of +12.5% for *Up >10%*, +7.5% for *Up 6-10%*, +2.5% for *Up 1-5%*, and 0 for *Flat* (with analogous increments for the *Down* categories). Shown in Figure 7 below, these metrics also indicate the relative strength in Storage and Communications, and notable weakness in Printing.

**FIGURE 7. Weighted Average 2024E Spending Growth Outlook**



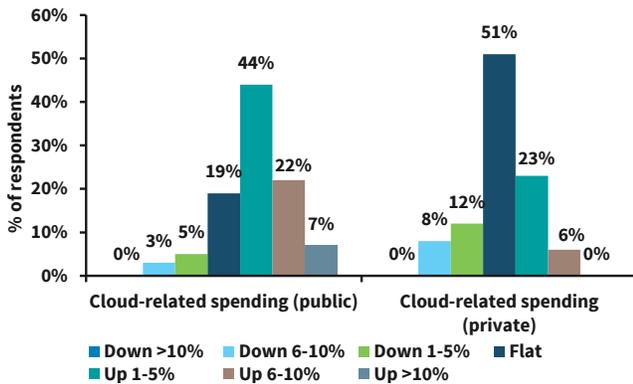
Source: Barclays CIO Survey program.

**Cloud Services**

Our 2H23 CIO survey indicates 2024 outlook slightly more tempered for Private Cloud, while Public Cloud growth expectations remained strong. About 20% of respondents expect Private Cloud spending to decline, while 8% expect Public Cloud spending to decline. 73% of respondents expect increased Public Cloud spending as compared to 74% in 1H23, both figures well below the 94% figure in 2H21. The expected spending increase in Private Cloud fell from 35% to 29%.

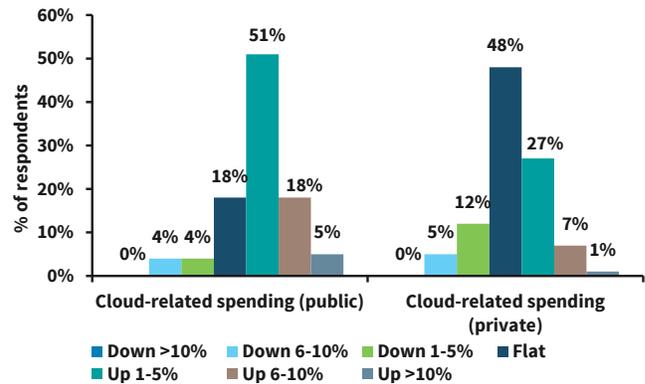
**Barclays CIO Survey – Expectations Remain Strong Primarily for Public Cloud Spending**

**FIGURE 8. 2H23 (expectations for 2024)**



Source: Barclays CIO Survey program.

**FIGURE 9. 1H23 (expectations for 2023)**

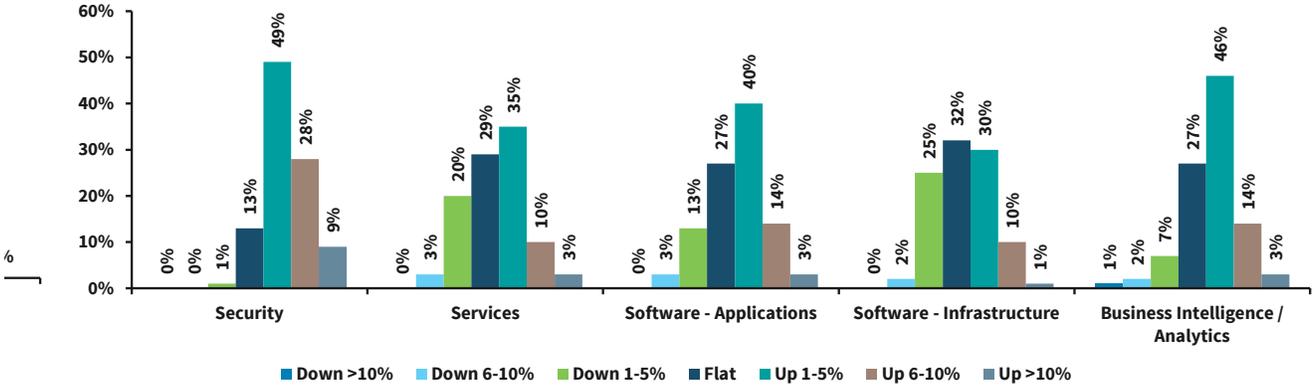


Source: Barclays CIO Survey program.

**Software and Services Trends**

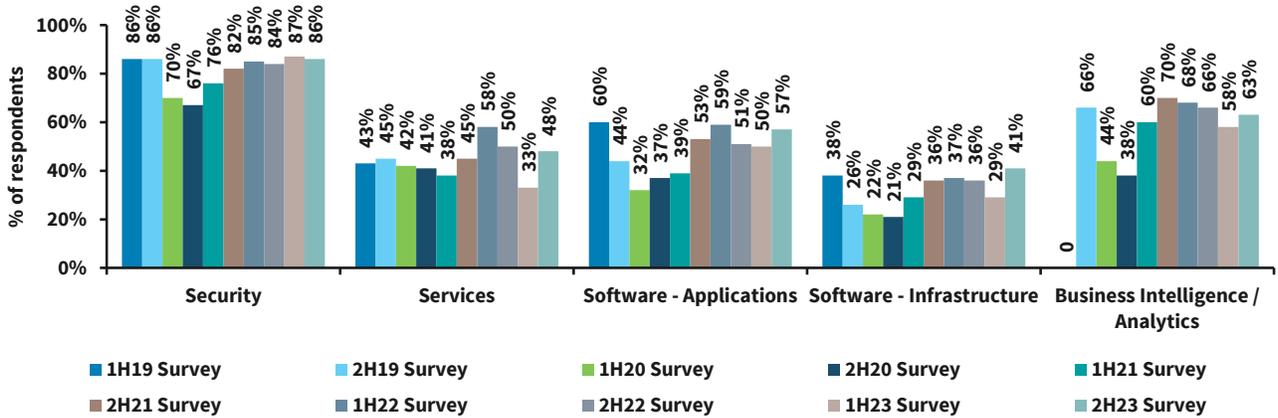
Software and services spending trends continue to skew more positively than the Hardware sectors across categories, particularly within Security with 86% of respondents expecting growth. All categories except Security increased from 1H23 expectations with Security largely the same as the prior survey. Services increased from 33% to 48%, Software-Infrastructure from 29% to 41%, Software - Applications from 50% to 57%, and Business Intelligence/Analytics up from 58% to 63%.

**FIGURE 10. Barclays CIO Survey – Security Continued to Lead Expectations for Increased Spending**



Source: Barclays CIO Survey program.

**FIGURE 11. % of Respondents Expecting Growth, 2024E**

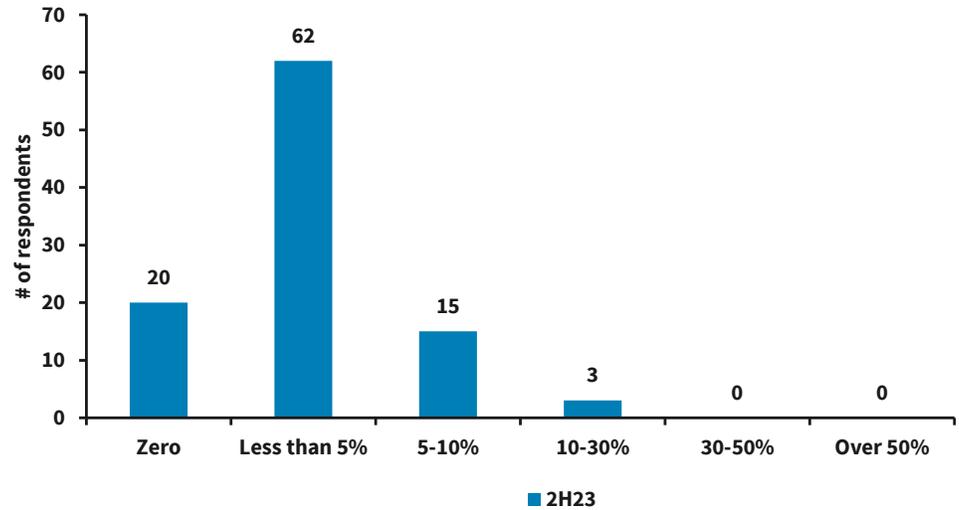


Source: Barclays CIO Survey program.

*CIO Survey – Question #3: (A) What percentage of total IT spending is AI-related? (B) Over the next 12 months, please select the Top Three vendors likely to see increased IT spending from your company because of AI-based initiatives?*

Despite much industry noise around accelerating AI investments, the majority of respondents expect less than 5% of their total IT spend to be AI-related, with only 18% of respondents expecting AI-related spend to comprise 5-30% of their spend.

**FIGURE 12. Barclays CIO Survey - Percentage of respondents' total IT spending that is AI-related**



Source: MISSING

The top vendors listed as likely to see increased IT spending dollars because of respondent's AI-based initiatives are Cisco, Palo Alto Networks, Dell/EMC, and Pure Storage. Both Jabil and Super Micro received no votes.

**FIGURE 13. Barclays CIO Survey - Top Vendors Likely to See Increased IT Spending Dollars because of Respondents' AI-based Initiatives**

	Weighting	1.00	0.50	0.33		2H23 CIO Survey	2H23 CIO Survey
		#1	#2	#3	Total Count	Wtd. Score	Adj. Score
Cisco Systems		20	22	16	58	36	59
Palo Alto Networks		25	11	16	52	36	59
Dell/EMC		20	17	17	54	34	56
Pure Storage		9	18	6	33	20	33
Hewlett-Packard Enterprise		5	10	16	31	15	25
Crowdstrike		6	11	8	25	14	23
Juniper Networks		5	6	6	17	10	16
Nvidia		5	4	8	17	10	16
Arista Networks		4	0	3	7	5	8
CDW Corporation		1	1	2	4	2	4
Flex Ltd		0	0	2	2	1	1
Jabil Inc		0	0	0	0	0	0
Super Micro Computer Inc		0	0	0	0	0	0

Based on weighted ranking of respondents' top three choices for vendors likely to see increased spending levels due to AI-based initiatives  
Source: Barclays CIO Survey program.

**CIO Survey – Question #4: Over the next 12 months, please select the Top Three vendors likely to see increased IT spending from your company because of Cloud-based initiatives?**

Vendor-specific cloud spending allocations are shown in Figure 14. Microsoft remained as the No. 1 vendor for increased spending expectations with Amazon AWS coming in at No. 2. Microsoft gained 8 points since the 1H23 survey and AWS lost 1 point.

Amazon AWS and Microsoft’s share of the Adj. score ticked up two points from 52% in 1H23 to 54% in 2H23, resulting in the two market leaders maintaining the majority of the Adj. score. The

No. 3-6 players (Cisco, Google, Palo Alto Networks, Oracle) dropped their share to 15% from 17% in 1H23, down from 18% in 1H22 and 20% in 2H21.

Spending growth expectations for the top players, Amazon AWS and Microsoft are notably steady.

### **Hardware Pressure Here to Stay**

VMware gained points in 2H23 and Dell/EMC saw no change. Google saw a 9 point downtick with Cisco down 2 points as well. Arista's IT spending expectations saw no change since 2H21. Respondents expect Oracle to lose two points and Splunk to lose 3.

Little has changed since 1H22 as CIOs expect modest spending increases while uncertainty in the broader economic environment this year on top of the market recovery process from Covid-19 continues to loom. On-premises hardware companies like Dell/EMC also see further spending slowdown.

**FIGURE 14. Barclays CIO Survey – Vendors Likely to See Increased IT Spending Due to Cloud-Based Initiatives**

	Weighting			Total Count	2H23	1H23	Change
	1.00	0.50	0.33		CIO Survey	CIO Survey	
	#1	#2	#3		Adj. Score	Adj. Score	
Microsoft	50	14	10	74	99	91	8
Amazon Web Services	29	15	8	52	64	66	-1
Cisco Systems	4	4	5	13	13	15	-2
Google	1	7	8	16	12	20	-9
Palo Alto Networks	1	7	7	15	11	11	0
Oracle	2	5	5	12	10	12	-2
Dell/EMC	2	3	6	11	9	9	0
VMware	1	5	6	12	9	5	4
Salesforce	2	3	5	10	8	10	-1
Snowflake	1	5	5	11	8	4	4
Zscaler	0	3	6	9	6	8	-2
SAP	0	4	3	7	5	4	1
Accenture	2	1	1	4	5	4	1
Workday	2	0	2	4	4	3	2
Datadog	0	3	3	6	4	4	0
ServiceNow	0	3	3	6	4	5	-1
Pure Storage	0	4	1	5	4	5	-1
Fortinet	1	1	1	3	3	3	0
Hewlett-Packard Enterprise	1	1	1	3	3	3	0
Elastic	1	1	0	2	2	1	2
IBM	0	2	1	3	2	2	0
Check Point	0	1	2	3	2	1	1
Capgemini	0	2	0	2	2	2	-1
Equinix	0	2	0	2	2	0	2
Splunk	0	0	3	3	2	4	-3
Citrix	0	1	1	2	1	1	0
Coupa	0	1	1	2	1	1	1
Nutanix	0	1	1	2	1	3	-2
Offshore services providers (Cognizant, Infosys, Tata, Wipro)	0	1	1	2	1	1	1
Cognizant	0	0	2	2	1	0	1
Confluent	0	0	1	1	1	0	1
UiPath	0	0	1	1	1	2	-1
Arista Networks	0	0	0	0	0	0	0
Couchbase	0	0	0	0	0	0	0
CSC	0	0	0	0	0	0	0
DigitalOcean	0	0	0	0	0	0	0
Digital Realty	0	0	0	0	0	0	0
F5 Networks	0	0	0	0	0	1	-1
Juniper	0	0	0	0	0	0	0
MongoDB	0	0	0	0	0	0	0
NetApp	0	0	0	0	0	0	0
Rackspace	0	0	0	0	0	0	0
Symantec	0	0	0	0	0	0	0
Other (please specify):	0	0	0	0	0	0	0

Based on weighted ranking of respondents' top three choices for vendors likely to see increased spending levels due to the cloud  
 Source: Barclays CIO Survey program.

***CIO Survey – Question #5: Over the next 12 months, please select the top three vendors likely to see reduced IT spending from your company because of Cloud-based initiatives?***

Figure 15 shows which vendors are expected to be the most adversely impacted by the cloud shift. Dell/EMC again topped the list as most vulnerable to reduced spending over the next 12 months while Cisco lost 2 points to remain below HPE at the No. 3 spot on the list. HPE lost 1 point and IBM lost 5 points. Oracle gained 5 points while VMWare fell 3 points.

**Key Take:** Legacy vendors Dell/EMC and HPE saw notable increases in potential budget reduction expectations. Other vendors saw decreases or little change while the current spending environment stays conservative.

**FIGURE 15. Barclays CIO Survey – Vendors Likely to See Reduced IT Spending Due to Cloud-Based Initiatives**

	Weighting			Total Count	2H23	1H23	Change
	1.00	0.50	0.33		CIO Survey	CIO Survey	
	#1	#2	#3		Adj. Score	Adj. Score	
Dell/EMC	18	10	8	36	42	46	-4
Hewlett-Packard Enterprise	14	13	8	35	38	39	-1
Cisco Systems	15	7	5	27	33	35	-2
Oracle	11	6	4	21	25	20	5
IBM	5	13	9	27	24	29	-5
VMware	3	8	7	18	15	18	-3
NetApp	3	6	6	15	13	13	0
Citrix	4	6	2	12	13	14	-2
Cognizant	3	3	4	10	10	8	2
Google	2	4	1	7	7	5	2
Capgemini	2	3	2	7	7	7	0
Rackspace	2	2	3	7	7	4	3
F5 Networks	2	1	4	7	6	4	2
Amazon Web Services	2	2	2	6	6	10	-4
Check Point	1	2	5	8	6	4	2
Offshore services providers (Cognizant, Infosys, Tata, Wipro)	2	0	3	5	5	6	-1
Accenture	1	2	3	6	5	4	1
Symantec	1	0	5	6	4	3	1
Microsoft	2	1	0	3	4	6	-2
ServiceNow	2	0	1	3	4	4	-1
Salesforce	0	2	4	6	4	4	0
Splunk	1	1	2	4	4	4	-1
Cloudera	1	1	0	2	2	0	2
Juniper	1	0	1	2	2	2	0
Arista Networks	0	2	1	3	2	1	1
Pure Storage	1	0	1	2	2	0	2
SAP	0	0	4	4	2	3	-1
Fortinet	1	0	0	1	2	1	1
Palo Alto Networks	0	2	0	2	2	1	1
Teradata	0	1	1	2	1	3	-1
Nutanix	0	1	1	2	1	1	0
Red Hat	0	1	0	1	1	1	-1
Elastic	0	0	1	1	1	0	1
Equinix	0	0	1	1	1	0	1
Workday	0	0	1	1	1	0	1
Digital Realty	0	0	0	0	0	0	0
Zscaler	0	0	0	0	0	0	0
Other (please specify):	0	0	0	0	0	0	0

Based on weighted ranking of respondents' top three choices for vendors likely to see reduced spending levels due to the cloud  
 Source: Barclays CIO Survey program.

**CIO Survey – Question #6: (A) How many public cloud vendors do you work with currently? (B) Of your company’s total cloud-related spending (i.e., public and private), what percentage relates to each public cloud vendor versus private cloud, and what percentage goes to private cloud?**

In Question 6 (two-part question), we assess how CIOs are dividing their resources among different public cloud providers. The survey continues to confirm that customers are deploying

a multi-cloud approach, as respondents to Part A once again averaged two public cloud vendors. Like previous CIO surveys, results continue to show leadership by Amazon AWS and Microsoft Azure, with Google at a distant No. 3. Among the 91 CIOs who selected Microsoft Azure as one of their public cloud vendors (up from 88 CIOs in the previous survey), 57% (a decrease from 60% in the previous survey) consider Azure as their No. 1 vendor, and 41% view it as No. 2. Overall, results here reflected resiliency from Azure vs. the other hyperscalers, as both AWS and GCP saw greater declines in their adjusted score this time around. Among the 62 CIOs who use Amazon AWS (down from 67 CIOs in the previous survey), 58% (an increase from 51% in the previous survey) consider AWS as No.1, while 35% see it as a No. 2 vendor. Google Cloud saw a positive reversion from the previous survey with 24% of CIOs who use the platform (an increase from 16% in the previous survey) considering it their No. 1 vendor, with the remaining CIOs considering it their No. 2 or No. 3 vendor. We also highlight the healthy step-up for Oracle in the 2H23 survey, which we believe could reflect stronger demand for the company’s services as a result of the need for GPUs and AI compute. Rackspace and IBM remained flat compared to the 1H’23 survey, and these vendors (as well as Oracle) still continue to lag well behind Microsoft, Amazon, and Google. Finally, similar to previous surveys, DigitalOcean traction appears low, though the company caters towards SMBs while established enterprises are more heavily represented in the survey.

**FIGURE 16. Barclays CIO Survey – CIOs’ Choice for No.1 to No.4 Cloud Vendor**

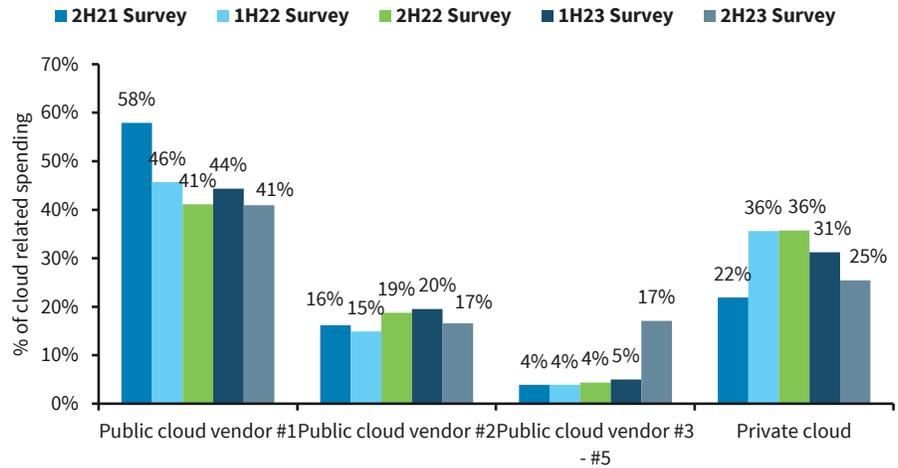
	Weighting				Total Count	2H23	1H23	Change
	1.00	0.50	0.33	0.25		CIO Survey	CIO Survey	
	#1	#2	#3	#4		Adj. Score	Adj. Score	
Microsoft Azure	52	37	2		91	102	103	-1
Amazon AWS	36	22	4		62	69	74	-5
Google Cloud	6	7	12		25	19	23	-3
Salesforce.com	1	3	4		8	5	8	-2
Oracle		5	3		8	5	3	2
Rackspace	2	1	1		4	4	3	1
IBM		2	2	1	5	3	3	0
Wasabi	1	1			2	2	n/a	n/a
Cisco		1	1		2	1	3	-2
ServiceNow			2		2	1	1	0
Dialpad		1			1	1	n/a	n/a
Equinix		1			1	1	n/a	n/a
SAP		1			1	1	0	0
Cloudflare			1		1	0	n/a	n/a
NetApp			1		1	0	1	-1
NTT			1		1	0	n/a	n/a
Dell EMC				1	1	0	1	-1

No respondents in our 2H23 survey used more than 4 cloud vendors  
 Source: Barclays CIO Survey program.

We also surveyed CIOs’ allocation plans among public cloud providers and on-premise / private cloud infrastructure. On average, the primary public cloud provider accounted for 41% of total cloud spending (same as last survey). Private cloud, which had been gaining traction over the last year, regressed to 25% of cloud spend (from 36% in 1H’23), while the #3-#5 options for public cloud spend more than quadrupled from 1H’23. We believe the results here could be indicative of AI demand, as GPUs are broadly distributed among the hyperscalers and other

IaaS players relatively evenly. Consequently, lesser emphasized cloud providers like OCI, as well as upstarts like CoreWeave and Lambda Labs have access to these GPUs, and could be seeing greater demand as a result.

**FIGURE 17. Barclays CIO Survey – CIOs’ Cloud Spending Allocation (Average)**

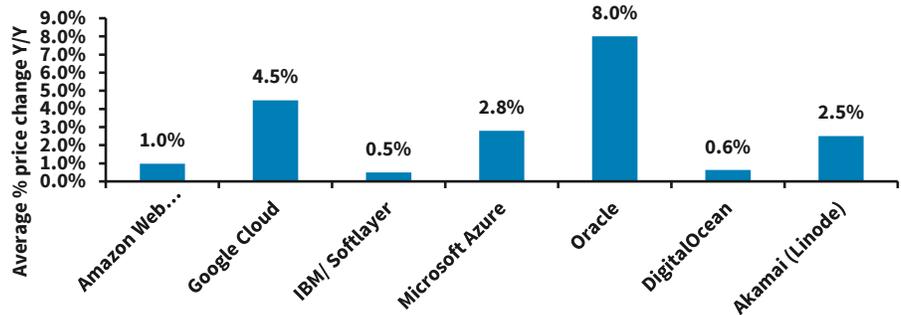


Source: Barclays CIO Survey program.

**CIO Survey – Question #7: How have the following cloud vendors changed their pricing relative to last year?**

Survey results show that the overall pricing environment for public cloud was up for all vendors, with more pronounced increases vs. the 1H’23 survey. Although cloud vendors are passing on some of the cost savings from scale to customers, premium services and the effects of inflation are likely counteracting some of these scale discounts, hence leading to weighted average y/y price increases on AWS, Azure, and GCP. Among the three largest hyperscalers, GCP stood out the most with the average price increase 4.5% higher y/y. We also call out Oracle, with y/y pricing increases of 8%. We continue to believe companies are getting increasingly comfortable with running workloads on the public cloud, and as such, they are starting to use the cloud not just for low-priority storage/compute workloads, but also for higher-value database and software services, as well as Generative AI more recently. The high demand for premium AI services from cloud vendors likely plays a large role in many of the increases seen in 2H’23, as these workloads tend to cost more as a result of the greater compute required. Additionally, with more data and applications already residing in the cloud, vendors may no longer need to cut prices to incentivize companies to migrate workloads, hence having the ability to pull price as a lever more in the future.

**FIGURE 18. Weighted Average Price Change (Y/Y) By Major Public Cloud Vendors**

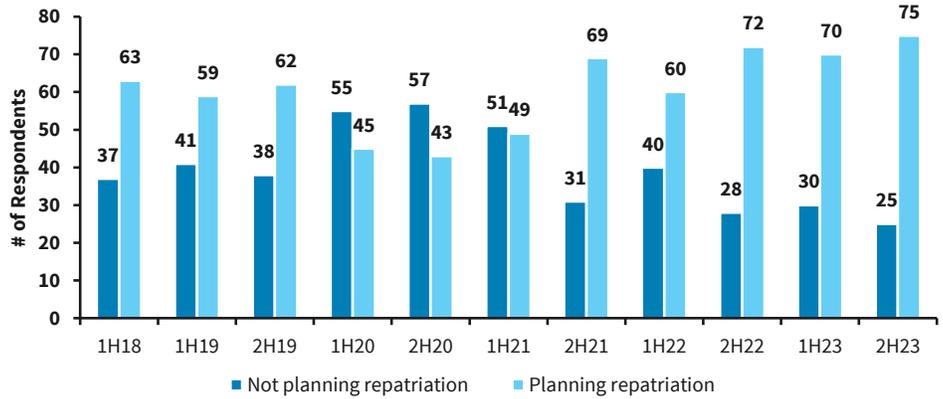


Source: Barclays CIO Survey program.

**CIO Survey – Question #8: Over the next 12 months, which workloads does your company plan to bring back to the private cloud or on-premise from the public cloud, and why?**

The proportion of respondents planning to repatriate workloads to private cloud or on-prem from public cloud declined markedly starting 1H20 but reversed sharply in 2H21 and has continued to increase since. Respondents planning to repatriate workloads fell from 62% in 2H19 to 45% in 1H20. However, the proportion of respondents planning repatriation rose from 49% in 1H21 to 69% in 2H21 and was 72% in 2H22. That number fell slightly to 70% in 1H23 but increased to 75% in 2H23, the highest reading since the survey has been conducted.

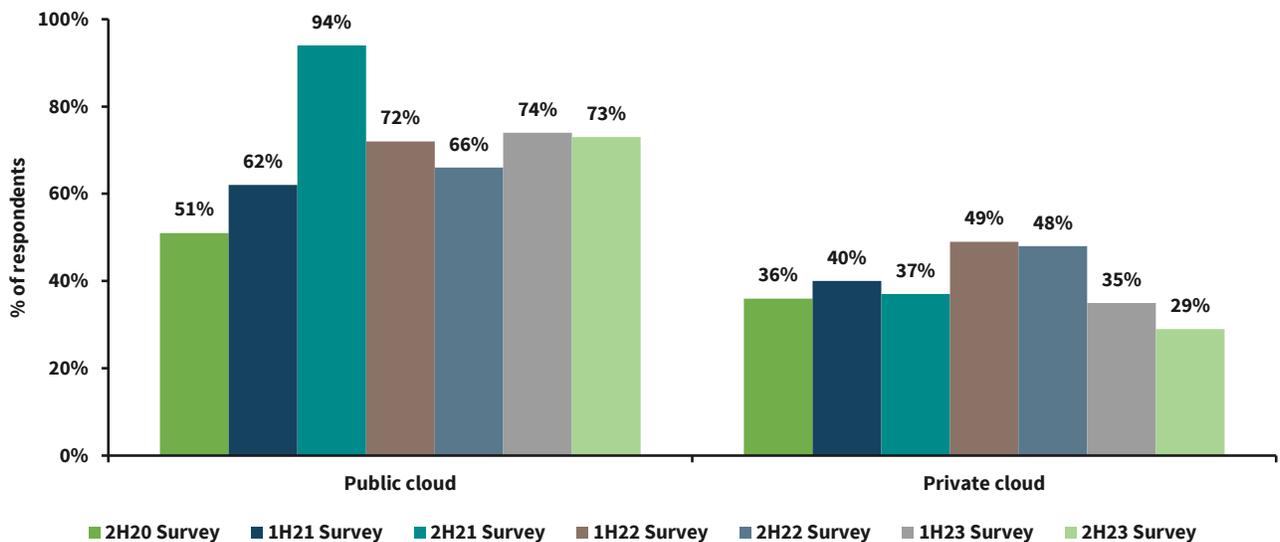
**FIGURE 19. Barclays CIO Survey – Percentage of Respondents Planning to Move Workloads Back on to Private Cloud / On-Premise from Public Cloud**



Source: Barclays CIO Survey program.

Figure 20 illustrates an elevated increased spending expectations on *public cloud*. Public cloud is here to stay despite plans to move workloads back to private cloud, which is encouraging for the group that private cloud spending expectations have roughly stabilized given the headwind of public cloud growth. Spending expectations for public cloud rose from 66% to 74% from 2H22 to 1H23 and has remained stable at 73% in 2H23.

**FIGURE 20. Barclays CIO Survey – Percentage of Respondents Expecting Y/Y Increases in Spending Levels, Current Year**



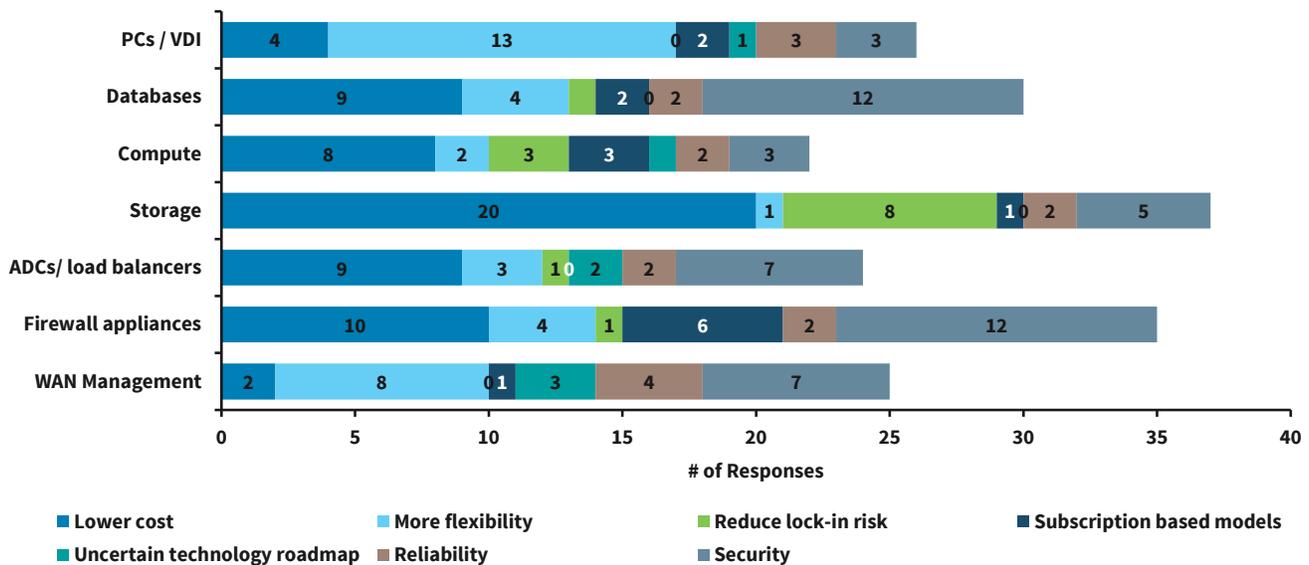
Source: Barclays CIO Survey program.

In this survey, Storage was the top workload respondents planned to repatriate (37 responses), followed by Firewall appliances (35), Databases (30), PCs/VDI (26), WAN Management (25), ADCs/load balancers (24), and Compute (22).

More granularly, as shown in Figure 21 below, Security remained the main reason for repatriating Firewall Appliances, and was also the main driver of Databases. Flexibility remained a main driver for PCs/VDI. Cost remained the main driver of Storage and Compute, and remained the main reason for repatriating ADCs/Load Balancers.

**Key Take:** The desire among CIOs for repatriation of workloads remained high resulting in the highest percentage of respondents planning the move back to private cloud/on-premise from public cloud yet. However, spending expectations are still stronger in public cloud vs. private cloud.

**FIGURE 21. Barclays CIO Survey – Workloads that Respondents Intend to Move Back to Private Cloud / On-Premise from Public Cloud**



Source: Barclays CIO Survey program.

**CIO Survey – Question #9: Please rank your company’s Top Three spending priorities related to software for the next 12 months.**

In this IT spending category, we excluded public cloud spending (since this theme is already well established). Like last three surveys, BI/Analytics, ERP, and CRM are the top three spending priorities for the next 12 months, though all three saw relatively flat results vs. 1H’23. We highlight communications/collaboration, ITSM, and Databases as verticals seeing greater spending momentum in the coming year, reversing a negative trend from the previous survey. Interestingly, all three of these solutions are prone to disruption benefit from recent AI advances, and we look to see if spending momentum remains positive here for an extended period of time. Additionally, we call out IT Monitoring and Digital Process Automation as two verticals seeing weaker demand. Like the three verticals we highlighted on the positive side, Digital Process Automation is likely to be disrupted by GenAI, and hence momentum here will be of interest to us as time goes on. Lastly, IT Monitoring (Observability) saw a steep falloff vs. 1H’23, which in our view partially reflects results from the 2Q earnings season, in which many vendors discussed continued optimization among their customer base.

**FIGURE 22. Barclays CIO Survey – Top Three Spending Priorities Related to Software Solutions for the Next 12 Months**

	Weighting			Total Count	2H23	1H23	Change
	1.00	0.50	0.33		CIO Survey	CIO Survey	
	#1	#2	#3		Adj. Score	Adj. Score	
BI / Analytics	26	17	13	56	64	62	2
Enterprise Resource Planning (ERP)	17	8	9	34	39	39	0
Customer Relationship Management (CRM)	12	12	8	32	34	32	1
Communications / Collaboration	12	5	10	27	29	25	4
Digital Process Automation (RPA, BPM, Process Mining)	5	11	11	27	23	28	-4
IT Service Management (ITSM)	10	4	6	20	23	17	6
IT Monitoring (Observability)	7	6	12	25	23	32	-9
Virtualization / Containers / Serverless	5	9	12	26	22	24	-2
Middleware / Data Integration	2	9	10	21	16	17	-1
Databases	2	10	5	17	14	10	4
Human Capital Management (HCM)	2	9	4	15	13	14	-1

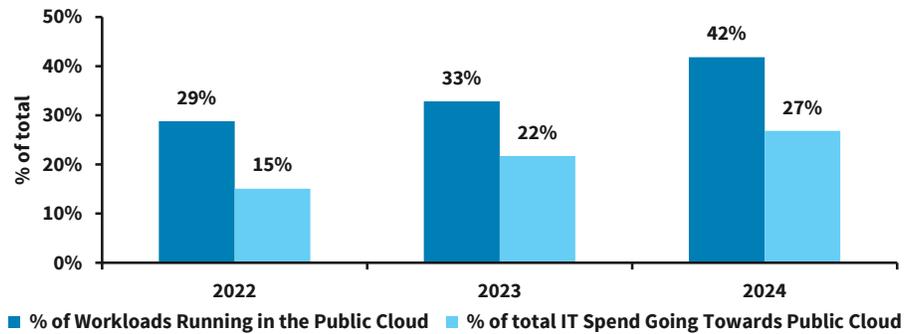
Source: Barclays CIO Survey program.

***CIO Survey – Question #10: What percentage of your workloads and what percentage of your total IT spend are going towards the public cloud, and how have those evolved over time?***

Consistent with the technological trends of the last three years, the survey results show that both workloads and IT dollars have increasingly been shifting towards the public cloud, and will continue to do so. This is driven by a combination of factors: (1) enterprises that began testing the cloud a few years ago are moving increasingly more workloads (and dollars) there as they realize the benefits of reduced operating cost and greater flexibility/ease of use; (2) regulated sectors, including financial services and government, have started moving development/test workloads over to the cloud; this is a result of increasing pressure on these organizations to lower costs, as well as Azure and AWS offering more compliance, regulatory, and security features; (3) the emergence of a number of companies with a “cloud-only” or “cloud-first” infrastructure; and (4) hybrid solutions (Azure stack) that help enterprises execute a smooth transition to the cloud.

Current optimization headwinds that began at the tail end of 2022 remain a cause for scrutiny in the later months of CY23 and into the coming year, as enterprises slowed on-prem to cloud workload transitions, and expansion of both new and existing cloud workloads slowed significantly. However, results from Q2 were cautiously optimistic, with vendors indicating that new workloads had begun to move to the cloud again, and existing customers were not reducing spend at the same rate they were prior. Looking at the results of the survey, this sentiment is echoed with the percent of workloads running in the public cloud in 2024 coming in at 42% (same as last survey), and IT spend going to the cloud at 27% (26% last survey). Our checks indicate that the majority of enterprise IT budgets were reset at the end of last year, and this change in spend could reflect a faster recovery heading into 1H24.

**FIGURE 23. Barclays CIO Survey – Percentage of Workloads and Spend Going To the Public Cloud**



Source: Barclays CIO Survey program.

In Figure 23 above, we can see that the % of IT spend in the public cloud has remained below the % of workloads in the public cloud for the past three years. This is because public cloud represents a deflationary force to IT spending, which is increasingly concentrated among a few large cloud vendors as opposed to each of their individual customers purchasing and maintaining infrastructure. Additionally, most companies are still using the cloud for storage/ compute and other lower-level processes (which require lower-priced cloud services), while mission-critical workloads continue to represent a smaller portion of overall workloads for now, although this portion is growing. As these “up-the-stack” workloads migrate to the cloud in the coming years, we believe they will drive margins and revenue higher for the cloud providers.

***CIO Survey – Question #11: For the below data management platform vendors, what is the expected change in your company’s spending levels over the next 12 months?***

The survey showed mixed results for cloud databases and data warehouses, with continued weaker results amongst a few leading vendors. Snowflake retained the top spot in terms of expected strong increases at 8, and we call out Azure CosmosDB (5), Oracle (4), Databricks (4), and Splunk (4) as other vendors with a large amount of expected strong increases. Microsoft SQL Server and Teradata both saw notable improvements over results from the last survey, while Google BigQuery, Couchbase, and Cassandra all saw notable contractions in wtd. score. On the NoSQL database front, Azure CosmosDB continues to be ahead of MongoDB in terms of expected change in spend over the next 12 months, with Amazon DynamoDB also surpassing Mongo in this survey. We also note the addition of Pinecone and Weaviate to the survey, reflective of the high demand for Vector database solutions as a result of generative AI applications. It is especially interesting to see the expectations for Pinecone spend, which CIOs indicate will see a major increase over the next 12 months, greater than many of the high growth SaaS DBs investors are familiar with.

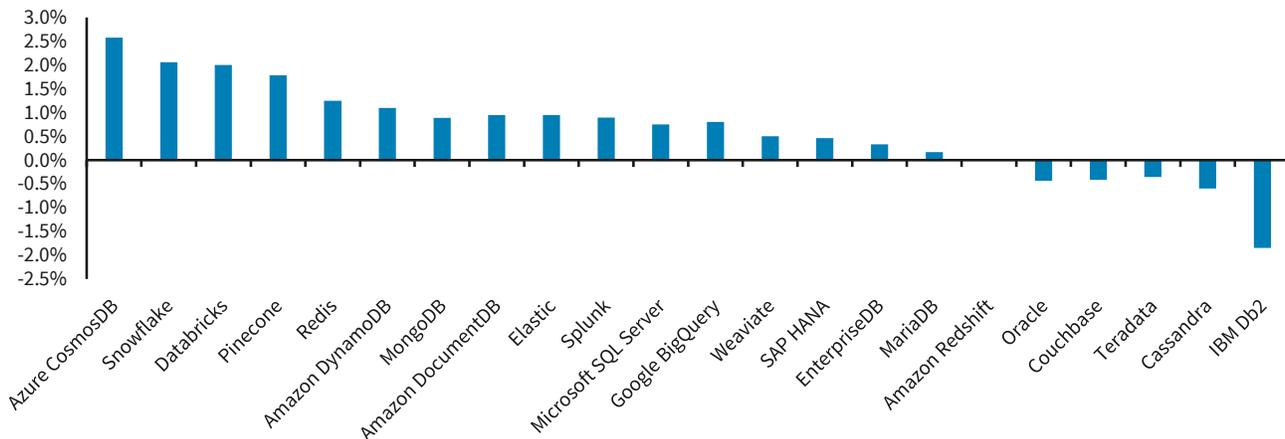
**FIGURE 24. Barclays CIO Survey – Expected Change in Spending Levels by Vendor over the next 12 Months (Top Security Vendors Based On Weighted Ranking Of Respondents' Top Three Choices)**

Weighting	2.00	1.00	0.00	-1.00	-2.00	Total Count	2H23 CIO Survey	1H23 CIO Survey	Change
	Strong Increase	Moderate Increase	No Change	Moderate Decrease	Strong Decrease		Wtd. Score	Wtd. Score	
Azure CosmosDB	5	21	5	0	1	32	0.91	0.74	0.17
Pinecone	0	5	2	0	0	7	0.71	n/a	n/a
Databricks	4	15	10	0	1	30	0.70	0.60	0.10
Snowflake	8	22	19	1	1	51	0.69	0.68	0.00
Redis	0	4	4	0	0	8	0.50	n/a	n/a
Amazon DynamoDB	2	11	10	0	2	25	0.44	0.40	0.04
Weaviate	0	4	0	0	1	5	0.40	n/a	n/a
Amazon DocumentDB	2	11	14	0	2	29	0.38	0.35	0.03
Elastic	0	15	10	4	0	29	0.38	0.36	0.02
MongoDB	1	12	16	1	1	31	0.35	0.39	-0.04
Microsoft SQL Server	0	43	24	10	3	80	0.34	0.22	0.12
Google BigQuery	1	9	17	0	1	28	0.32	0.48	-0.15
Splunk	4	16	24	9	0	53	0.28	n/a	n/a
SAP HANA	0	9	16	1	1	27	0.22	0.33	-0.11
EnterpriseDB	0	4	9	2	0	15	0.13	0.38	-0.24
MariaDB	0	4	24	2	0	30	0.07	0.13	-0.06
Amazon Redshift	0	7	14	4	1	26	0.04	0.05	-0.01
Oracle	4	21	21	12	11	69	-0.07	-0.10	0.03
Couchbase	0	1	10	0	1	12	-0.08	0.10	-0.18
Cassandra	0	1	18	0	2	21	-0.14	0.00	-0.14
Teradata	0	4	4	6	0	14	-0.14	-0.50	0.36
IBM Db2	0	1	12	6	4	23	-0.57	-0.76	0.20

Source: Barclays CIO Survey program.

We also looked at net spend increases minus net spend decreases by vendor over the next 12 months to get a sense of overall momentum. Here, we found that Microsoft SQL server occupies the top spot at 30, followed by Snowflake (28) and Azure CosmosDB (25). Similarly, like in the 1H'23 survey, Azure CosmosDB, MongoDB, and Amazon DynamoDB were the top three NoSQL/schema-less databases at 25, 11, and 11, respectively.

**FIGURE 25. Barclays CIO Survey – Expected Change In Spending Levels Over the Next 12 Months**



Source: Barclays CIO Survey program.

## Security-related Questions

**CIO Survey – Question #12: Please rank your company’s Top Three spending priorities related to security solutions for the next 12 months.**

The top 3 spending priorities in security over the next year based on survey results are: (1) endpoint security; (2) identity and access management (IAM) and (3) vulnerability management. Endpoint continued to be top-of-mind in security among CIOs in this survey while IAM remained in second place and VM remained in third place, albeit downticking some, consistent with the prior survey. Email security saw a strong uptick in interest, pushing it up to the #4 spot while firewall appliance refresh saw a downtick.

In the current poll, endpoint security maintained its No. 1 spot and we think it remains a top area of spend among CIOs because (1) endpoints continue to be outside the corporate perimeter and/or part of a growing BYOD fleet; (2) disruptive vendors continue to take share against long-standing legacy tools. First, while companies continue to return to office at a broad scale, we think many embrace a hybrid model, which naturally expands the attack surface, making securing endpoints as important as it was during the height of the pandemic. From a market standpoint there are also disruptive vendors gaining share, prompting customers with long-standing endpoint anti-virus software to explore new options – much like what happened in the firewall market in the early 2000s as the industry moved from stateful inspection to next-gen firewall.

Identity and Access Management ranked No. 2, consistent with our prior survey, and saw a strong uptick in interest in this iteration of the survey; we weren’t surprised to see this uptick because we believe this is key area for two main reasons: (1) high profile breaches like the MGM breach show that identity is a key vector for attacks, and (2) legacy IAM is still broadly used, and arguably due for modernization. Following a breach, a focus for enterprises is to closely monitor and secure who comes in and out of the environment, and privileged accounts specifically are major targets of breaches, which would make privilege identity within broader IAM a focal point among CIOs. The second point, which ties in with the first, is that there remains a large installed

base of legacy identity solutions in need of replacement by next-gen platforms, a trend we think led to an initial uptick in interest after the SolarWinds breach.

Vulnerability management ranked No. 3 in this iteration of the survey, consistent with our last survey around 6 months ago, although it down ticked materially in this survey. It is not surprising that VM remains at the forefront of security conversations as the number of high-profile vulnerabilities continues to increase, examples being the Log4j vulnerability in late 2021 and more recently the MOVEit hack. Firewall appliance refresh saw a downtick in interest which pushed it down to the #5 spot while email security took its place at #4 with an uptick in interest. We think this down tick in firewall appliance refresh aligns with the cyclicity of the hardware firewall market as 2022 was a strong year in firewall with continued refresh activity and some demand pull forward as customers ordered ahead of supply chain delays, while 2023 has faced macro impacts and delayed refresh projects for firewall vendors.

Virtual firewall instances for public cloud workloads and secure access service edge (SASE) were both flat to slightly up in this iteration of the survey. Note, we started including SASE in our last survey around 6 months ago to track interest as we are often asked if SASE will eventually reduce the need for firewalls.

**FIGURE 26. Barclays CIO Survey – Endpoint, identity, and VM remain top 3; rounding out top 5 are email security and firewall refresh (Top security spending priorities based on weighted ranking of respondents' top three choices)**

	Weighting	1.00	0.50	0.33	Total Count	2H23	1H23	Change
		#1	#2	#3		CIO Survey	CIO Survey	
						Adj. Score	Adj. Score	
Endpoint security solutions		26	22	14	62	68	67	2
Identity and access management		19	11	14	44	48	43	4
Vulnerability Management		7	16	18	41	34	41	-7
Email security (anti-spam/anti-malware)		9	17	5	31	31	26	5
Firewall appliance refresh		10	9	11	30	30	38	-9
Virtual firewall instances for public cloud workloads		10	8	9	27	28	28	0
Security information and event monitoring / data analytics of security events		8	11	6	25	25	24	2
Secure access service edge (SASE)		6	3	16	25	21	19	2
DDoS mitigation		3	1	3	7	7	5	2
Firewall Policy Management		2	2	4	8	7	8	-1

Source: Barclays CIO Survey program.

**CIO Survey – Question #13: Over the next 12 months, please select the Top Three security vendors likely to see the largest percentage increases in spending from your company.**

CrowdStrike retained its #1 rank in our latest survey after it displaced Microsoft a couple surveys ago. Microsoft came in at #2 followed by Palo Alto at #3, Cisco at #4, and Fortinet at #5, all consistent with our prior survey. We have four takeaways on results of the top vendors: (1) CrowdStrike held its spot as the number one security vendor which is not surprising given the consistent top finishes for endpoint as a priority; (2) Palo Alto retained its position at #3 and saw a strong uptick in interest while Fortinet and Check Point both saw a down tick; (3) Zscaler saw a down tick in interest, which we were surprised to see, versus the steady showing for SASE; (4) Tenable and Rapid7 saw a down tick in interest, which aligns with the down tick we saw more broadly for vulnerability management in this survey.

CrowdStrike retained the #1 spot and saw an uptick in interest, which we think makes sense given the elevated threat landscape is being exacerbated by concerns of potential cyber response to western countries' support for Ukraine. Endpoint and Identity are the key landing

points for attackers in the new more distributed work environment, and we think CrowdStrike's Falcon platform is viewed as best of breed by both customers and industry analysts spanning from endpoint security, to conditional access management, incident response and others.

Palo Alto Networks held the #3 spot and saw strong interest which we think makes sense given its platform approach and continued share gains the firewall market. We are not surprised that Palo Alto retained its position given its broad Next-Gen Security platform, which includes security offerings outside of firewall like cloud security, SASE, and XDR – we think this broad platform approach appeals to some customers looking to consolidate its security products with one vendor. Fortinet saw a down tick in this survey which we think is inline with the decreasing prioritization of firewall refresh, and Check Point also saw a down tick as it continues to donate share in the firewall market. Zscaler saw a downtick in interest, which we were surprised to see given the growing demand for SASE solutions and Zscaler's dominant market position in the space.

Rapid7 and Tenable both saw a downtick in this survey, which coincides with the broader VM deprioritization that we saw in this survey. For Rapid7, we wonder if part of this move could be related to the recent changes in its salesforce and the broader layoffs in the organization as we have seen corporate changes sometime be disruptive to the business. We do however, think it is worth noting that Rapid7 continues to maintain relatively high mindshare in this enterprise CIO survey. For Tenable, given that the company maintains the largest market share in VM, it is not surprising to see the company fall in lockstep with the overall market, and also think this coincides with market forecasts showing the VM market decelerating in growth.

**FIGURE 27. Barclays CIO Survey Respondents Rank CRWD, MSFT, PANW, CSCO as Top 4 Security Companies (Top Security Vendors based on Weighted Ranking of Respondents' Top Three Choices)**

	Weighting			Total Count	2H23	1H23	Change
	1.00	0.50	0.33		CIO Survey	CIO Survey	
	#1	#2	#3		Adj. Score	Adj. Score	
CrowdStrike	25	6	5	36	49	46	2
Microsoft	12	19	19	50	46	44	2
Palo Alto Networks	13	9	9	31	34	26	8
Cisco Systems	11	7	7	25	28	22	5
Fortinet	7	2	7	16	17	20	-4
Okta	3	8	6	17	15	13	1
Zscaler	3	6	7	16	14	18	-5
SentinelOne	4	4	1	9	10	8	2
Rapid7	4	2	3	9	10	15	-5
Carbon Black/VMware	2	4	3	9	8	9	-1
Splunk	1	5	4	10	8	11	-3
Varonis	2	3	2	7	7	6	1
IBM	1	5	1	7	6	4	2
SailPoint	1	3	4	8	6	5	1
Check Point	2	2	2	6	6	9	-3
Symantec	1	2	5	8	6	5	1
F5 Networks	3	0	1	4	5	5	0
Cloudflare	0	2	7	9	5	3	2
Cyberark	2	1	1	4	5	7	-2
Tenable	1	1	2	4	4	6	-2
Sophos	0	3	0	3	2	2	0
Elastic	1	0	1	2	2	3	-1
Imperva	0	2	1	3	2	1	1
Sumo Logic	1	0	0	1	2	0	2
Juniper	0	1	1	2	1	2	-1
Qualys	0	1	0	1	1	2	-1
Ping Identity	0	1	0	1	1	1	0
Trend Micro	0	1	0	1	1	3	-2
Snyk	0	0	1	1	1	2	-1
Exabeam	0	0	0	0	0	0	0
Netskope	0	0	0	0	0	n/a	n/a
Other, please specify:	0	0	0	0	0	0	0

Source: Barclays CIO Survey program.

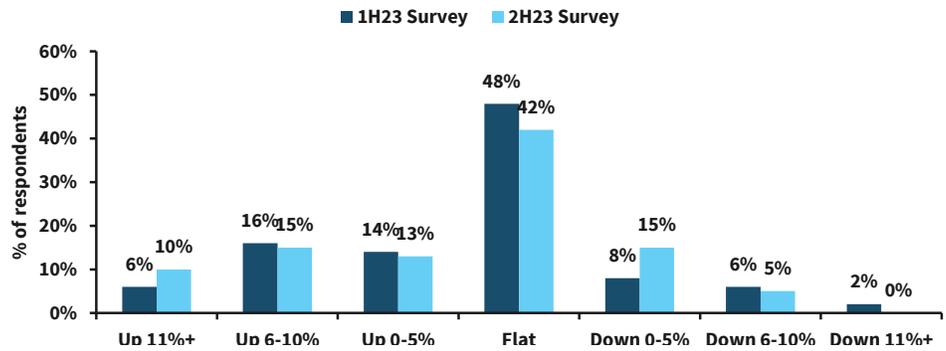
**CIO Survey – Question #14: As more of your workloads move into the public cloud, how do you see your installed base of firewall appliances trending over the next 3 years?**

This is the tenth time we have asked this question and we believe it is an important one to track in security longer term, as there remains the question of what happens to firewall appliances as the world increasingly adopts the public cloud. Results in this survey show a fairly consistent outlook for firewall fleets compared to our last survey, with an uptick in both respondents expecting their fleet to trend up over the next 3 years and those expecting it to trend down. Specifically, 38% of respondents expected their firewall appliance base to grow over the next three years, with 20% expecting their base to decline, while 42% expected it to be flat – this compares to the 36% that expected growth and the 16% that expected a decline in their firewall fleets in the prior survey.

In our view, there are a number of drivers for firewall appliance growth despite public cloud adoption. Internet traffic continues to grow driven by the increased use of SaaS applications. In addition, a greater portion of Internet traffic is becoming encrypted. As a result, customers need to buy either larger/more expensive appliances or more of them to handle the growing traffic and enable the capacity to perform more security inspections like SSL. Another trend is internal segmentation, which requires more firewalls to block off different departments within an enterprise to reduce the attack surface. Additionally, we have seen trends since the onset of the Covid-19 pandemic in which customers “panic bought” more firewall boxes in order to get bigger internet “pipes” to support a remote workforce.

On the other hand, more workloads are moving outside of the corporate perimeter to public cloud, implementing a virtual firewall or possibly a native tool from the IaaS vendor to protect the workloads. We believe these reasons are key drivers of the survey result, in which 62% of respondents don’t expect their firewall appliance base to grow over the next three years.

**FIGURE 28. Barclays CIO Survey – Public Cloud Impact on Firewall Spending**



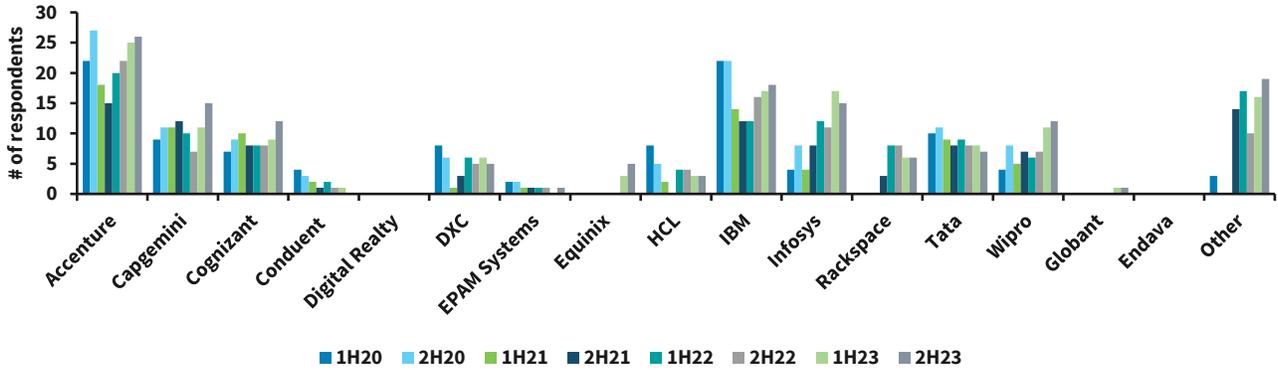
Source: Barclays CIO Survey program.

## IT Services-related Questions

**CIO Survey – Question #15: Which of the following IT service providers has your company either selected or strongly considered for new contracts or expansion of existing business in the next 12 months?**

For the question on IT Services vendors, results showed Accenture, IBM, Infosys and Capgemini having the largest presence in the market. Capgemini, CTSH and Other saw the largest increase in responses, which we believe is driven by the increasing shift towards cost-cutting projects. INFY had the largest decrease, though remained a top choice, followed by a smaller decline for Conduent, DXC, and TCS. We did not see nearly as much variation in responses compared to our 1H23 survey, which we believe reflects continued caution and slower decision-making amongst IT Services clients.

FIGURE 29. Barclays CIO Survey – IT Services Providers being Considered for New Contracts or Expansions in the Next 12 Months

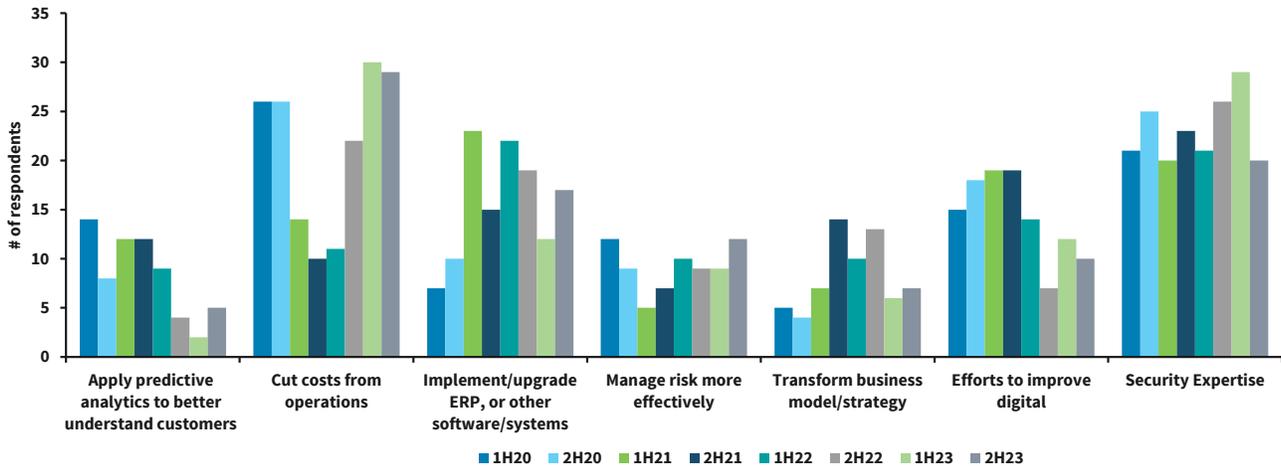


Source: Barclays CIO Survey program.

**CIO Survey – Question #16: In the next 12 months, for which of the following tasks is your company most likely to hire an outsourcing/consulting provider?**

On the question on outsourcing/consulting, our survey respondents expressed the largest increase in interest in implementing/upgrading ERP, or other software/systems. We believe this increase to be primarily driven by the realization that enterprises need to have upgraded core systems in order to take advantage of Generative AI. Applying predictive analytics and managing risk more effectively saw a nice improvement, which we think is driven by CIOs looking for ways to optimize their own enterprise while an uncertain macro-backdrop remains. We note that security expertise saw the sharpest decline, but only after ~3 years of elevated responses.

FIGURE 30. Barclays CIO Survey – Focus Areas for IT Service Providers in Next 12 Months



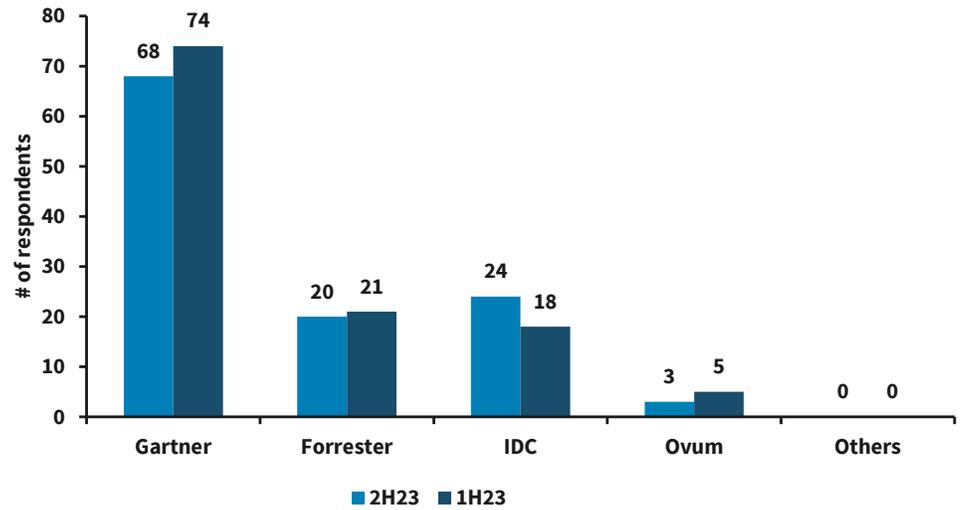
Source: Barclays CIO Survey program.

**CIO Survey – Question #17: (A) Which Technology Research Vendor(s) do you subscribe to regularly? (B) Over the NTM would you be looking to increase or decrease your spend with Gartner?**

Results show that most CIO’s use Gartner (as we expected), but that expectations are low for NTM technology research spend. 43% are looking to decrease seats, offerings, or both over the NTM, while 51% see no change and 6% see an increase in either or both. On a net basis, results were -37% vs. -31% prior for increasing/decreasing spend. We note that we have only asked this question since 2H22 so we do not have much historical context, but it has correlated with Gartner’s recent CV slowdown and results suggest that underlying technology research spend

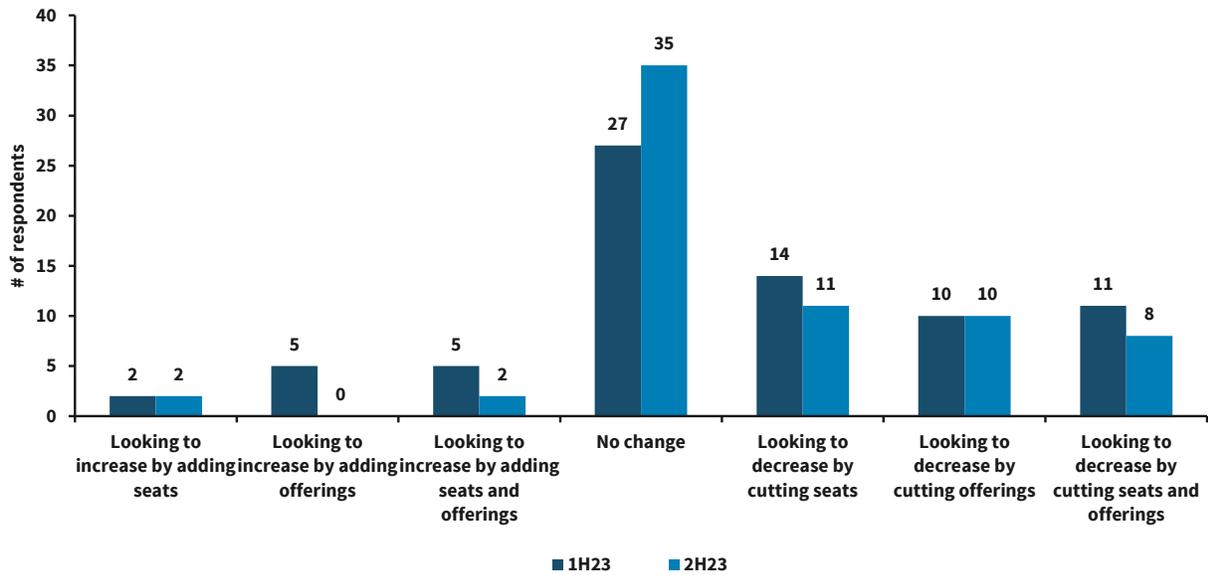
(i.e. excluding Gartner’s and competitor’s regular pricing) may slow more than overall technology spend.

**FIGURE 31. Barclays CIO Survey – Technology Research Vendors Subscribed to Regularly**



Source: Barclays CIO Survey program.

**FIGURE 32. Barclays CIO Survey – CIO Spend Expectations with Gartner Over the Next Twelve Months**



Source: Barclays CIO Survey program.

## IT Hardware and Communications Equipment

Tim Long, BCI, US | George Wang, BCI, US | Alyssa Shreves, BCI, US | Emma Cho, BCI, US

### Sector Implications

Total IT spending level expectations for 2023 stayed roughly the same at 2.2%, with 2024 expectations initiated at 3.1%. 2024 expectations remain lower than early 2022 reads, but higher than 2023 outlook. Although spending in 2023 has remained flat, the uplift in initial 2024 expectations a positive for the sector. However, the precarious economic environment could dampen (or accelerate) spend, depending on macro condition.

Communications and Servers ticked up to 45% and 27%, respectively, though the rest of hardware verticals continued to slide since 2H22. Communications and Storage are now the strongest categories, though Storage ticked down 3 points from 1H23. We continue to see repatriation of workloads to the private cloud/on-premise from the public cloud primarily driven by storage, with respondents citing lower cost as a primary reason for the switch. 73% of respondents indicated they were expecting increases in public cloud spending versus 74% in 1H23. It is important to point out that spending expectations are still stronger in public cloud even as CIOs plan to repatriate.

Expectations for repatriation of workloads continue as the public cloud spending outlook decelerates:

- **Cost.** The #1 reason for pulling workloads back, and has moved from 50 respondents to 66 to 62 over the last three surveys. On-prem vendors are working on solutions that are more cost effective than the public cloud.
- **Security.** From 42 respondents to 48 to 49 over the last three surveys. This is always a focus for large enterprises.
- **Reliability.** Moved from 28 respondents to 51 to 17 over the last three surveys. Despite many high profile public cloud outages, these do not seem to be consistently influencing decisions.
- **Subscription models.** From 24 to 10 to now 15 respondents. Most legacy hardware companies are rolling out subscription based offerings, moving spend from capex to opex.
- Storage was the top type of workload repatriated, going from 35 respondents to 31 to 37 over the last three surveys.

### Stock Implications

**Positive:** We view the results around repatriation are positive for the whole group, particularly those in Storage and Networking. Strong Storage spending suggests a higher probability of increased revenue for **PSTG**, which has been mentioned more as a cloud beneficiary in recent surveys.

**Mixed.** **HPE**, **CSCO** and **DELL** still get mentioned most as negatively impacted by the move to Public Cloud, though the sector views for Communications and Storage are pretty strong. **NTAP** doesn't screen that well, and the transition to a cloud model has been a bumpy ride. Likewise, **JNPR** and **ANET** don't get many mentions, but we see their public cloud businesses as strong with great backlog.

**Negative:** Printing was once again the most challenged area in the survey and saw further significant deterioration, a fundamental headwind for **HPQ**.

## U.S. Software

**Raimo Lenschow**, BCI, US | **Isaac Piliavin**, BCI, US

### Sector Implications

In our 2H'23 survey, we began to see a slight shift to more positive sentiment, driven by a bit of an ease up on optimizations, and an improved spend environment for apps and infrastructure following a challenging 2022 in software. Similar to what we saw in Q2 earnings, our survey offered indication that cloud optimizations are starting to level out, with expectations for this year and next year starting to tick up a bit more, and a greater portion of IT budgets expected to be devoted to cloud spend vs. in 1H23. Additionally, applications saw healthy momentum from results last quarter, with verticals including communications, ITSM, and Databases standing out as positives. We also highlight underwhelming observability spending expectations, which reflects sentiment from the past earnings cycle as well.

### Stock Implications

Different from 1H'23, our survey was particularly bullish for communication and collaboration tools, ITSM, and databases. However, BI/Analytics, ERP, and CRM continue to remain the top three spending priorities, with relatively stable to positive results vs. our last survey. These trends, combined with individual vendor rankings, bode well for Microsoft, Oracle, ServiceNow, Snowflake, and Teradata.

Expectations for cloud spending appear to be finding their level after a tumultuous year-long stretch, where we saw optimizations weigh down on both public and private spend. With this, **Microsoft** looks like one of the biggest beneficiaries in our survey. The percentage of workloads and percentage of total IT spend going towards the public cloud are expected to increase from 33% and 22%, respectively, in 2023 to 42% and 27% in 2024. In our 2H'23 results, Azure was again ranked as the number one cloud provider among respondents, and we note results here appeared to hold up better vs. the other hyperscalers, which we believe could be in part due to the company's apparent lead in AI and early/expansive offerings. **Oracle** also looks like a beneficiary, seeing the greatest jump in cloud usage amongst survey respondents (see Question 6), as OCI continues to gain traction and build out a comprehensive product suite. Our checks also continue to indicate optimization efforts peaking in the coming months, with positive commentary from Q2 earnings boding well for Azure and the other hyperscalers as we move into the final months of this year.

With regards to solution spend, BI/Analytics, ERP, and CRM continue to be the top three spending priorities for respondents, though we highlight improved sentiment in Communications/Collaboration, ITSM, and Databases here as trends to watch further. Interestingly, all three of these verticals are poised to be impacted by AI early on. Both **Microsoft** and **Salesforce** have announced a slew of product offerings pertaining to GenAI features in Teams and Slack. Likewise, **ServiceNow** plans to roll out generative AI into its Pro and Enterprise SKUs, which will allow the company to capture increased value via price. Lastly, on the database side, we highlight **Snowflake** for its strong results, coming off of mixed sentiment in 1H'23. SNOW continues to have strong vendor rankings with 8 CIOs expecting strong spending increases over the next 12 months, 3 higher than the next highest vendor. Additionally, on a product level, **Microsoft** appears to be gaining further traction with both SQL server and Azure CosmosDB being called out as areas expected to see rises in spend over the next 12 months. **Teradata** also showed a positive reversion from last survey, with 4 CIOs expected to moderately increase spend. Finally, we call out the emergence of vector database players Pinecone and Weaviate in this survey, as these DBs that allow users to create enhanced AI apps are seeing greater focus in the market today.

## U.S. Security

**Saket Kalia**, BCI, US | **Ryan Powderly-Gross**, BCI, US | **Joseph Pilleteri**, BCI, US | **Carly Buecker**, BCI, US | **Alyssa Lee**, BCI, US

### Sector Implications

Following multiple high-profile breaches over the past few years, it is no surprise the majority of CIOs in our survey continue to make security a top priority in spend – 86% of respondents expect to increase spending (vs. 87% in our last survey approximately six months ago). Even apart from the high-profile breaches, security spend has been more resilient than other areas of software in our view, we think the reason for this is the risk/cost dynamics of a breach from a technology and reputational perspective outweighing the cost of good security. Furthermore, we think there are still plenty of enterprises that do not have the maturity in their security programs needed to handle today’s attacks – especially with an expanding attack surface like a remote workforce – and require further investment in tools as well as subsectors of security, like Identity and Access Management (IAM), that are in need of a refresh from legacy products. As such, we think there are sub-segments in security that should benefit disproportionately – Endpoint and IAM remain top-of-mind as the top two categories in this survey.

### Endpoint security is once again the top spending priority; IAM and email security see an uptick while VM and firewall appliance refresh see lower interest

Endpoint security, IAM, and VM are the top three areas expected to see increased spend based on our survey, followed by email security and firewall refresh. Endpoint and IAM have consistently ranked high in recent surveys, which makes sense in our view as many enterprises are still using legacy endpoint solutions that are (1) seeing discontinuations of support and (2) being displaced by next-gen disruptors – Symantec being a prime example of this and this survey shows Symantec interest continues to decline. Much of the current identity infrastructure in use today is still decades old and also being displaced by newer vendors. In this survey, we saw a down tick in both vulnerability management and firewall appliance refresh, which could reflect the cyclicity of the hardware firewall market and jives with lower market growth in VM.

### Four takeaways on vendors: (1) CrowdStrike retains the top spot; (2) Palo Alto stays at number three with strong interest while Fortinet and Check Point see a down tick; (3) Zscaler down; (4) Tenable and Rapid7 down tick along with the broader VM market.

Digging deeper into vendors, CrowdStrike maintained its position over Microsoft as the top vendor in this survey, as the top priority in security continues to be endpoint and we think this suggests greater interest in CrowdStrike’s broader platform, particularly its identity, SIEM and cloud products. Palo Alto again rounded out the top three, gaining interest while Fortinet and Check Point both saw a down tick – this aligns with lower prioritization of broader firewall appliance refresh and shows interest in Palo Alto’s broader security platform. Zscaler declined in this survey which surprised us as we hear more about strength in the SASE market from security vendors and Zscaler is a leader in that market. Lastly, Rapid7 and Tenable both saw lower interest which aligns with a down tick in broader vulnerability management in this survey.

### Stock Implications

**CRWD/S:** With endpoint security maintaining the #1 spot in terms of priorities, CRWD and SentinelOne (S) stand to benefit given their disruption in the endpoint market. CRWD’s platform approach likely also plays a role in cementing CRWD as the top security platform.

**PANW/FTNT/CHKP:** Interest in PANW was up in this survey as it maintained its #3 spot in top security vendors, we think due to its platform approach. Fortinet saw a downtick in interest, which aligns with what we saw in broader firewall refresh in this survey, and Check Point saw lower interest as well, which we think reflects share shift dynamics in the firewall market.

**CYBR:** IAM kept its #2 position among CIO priorities and saw strong interest, but we note a slight downtick for CYBR in this survey.

**RPD/TENB:** With decreasing interest in VM as a priority, it's understandable to see interest decrease for RPD and TENB as well.

## U.S. Internet

**Ross Sandler**, BCI, US | **Trevor Young**, BCI, US | **John Hall**, BCI, US | **Alex Hughes**, BCI, US | **Joseph Petrolino**, BCI, US | **Jesse Chao**, BCI, US

The narrative in 1H23 was that many public cloud customers began to find ways to optimize cloud spend and put certain projects on hold due to the macro environment, as we heard from many names in our coverage. This came at the same time as an influx of AI announcements and capabilities, so a lot of companies were put between a rock and a hard place. We see this narrative shifting as cloud providers like AWS and GCP ramp up their AI offerings and look more attractive to companies looking to leverage these capabilities. AMZN mentioned some of the client cost optimizations are moderating and looking to drive innovation by bringing new workloads to the cloud. We think it is still coming to an inflection point, so this trend may not be fully showing up in the survey results just yet, especially because of the mix of respondents versus the total hyperscale cloud provider customer bases. Buy side sees AWS, the largest public cloud provider, getting through the worst of it in 3Q after dropping to low DD growth from high 20%'s in 3Q22, and potentially picking up a bit in 4Q. As this narrative continues to shift towards customers picking up AI workloads and less cost optimization, we see upside for AWS and GCP. Consistent with past CIO surveys, AWS and GCP remain the #2 and #3 public cloud providers, respectively, behind Azure (we note that our survey skews slightly towards SMB enterprise and less cloud-first, which tend to favor Azure over AWS). The survey results show more respondents expect to spend higher amounts on public cloud in 2024, with 31% of respondents looking to spend 6-10%+ y/y more in 2024 vs. 23% of respondents for 2023 in the last survey (Figure 8). More AI/ML product offerings resulting in higher prices (Figure 14) likely account for a lot of these price increases, especially with GCP and the amount of AI capabilities it has already offered to customers.

### Stock Implications

**AMZN:** AWS is still the public cloud industry leader with ~\$89bn in annualized run-rate revenue, but Azure continues to catch up. AWS revenue grew 12% y/y ex-fx in 2Q23 (\$786m q/q), the sixth straight quarter of growth deceleration and down 21 pts from 2Q22. We think revenue growth remains stable in 3Q (at 12%), as 2Q trends continued into July, and then starts to accelerate slightly again in 4Q from new workloads and AI product innovation. The AWS backlog grew to \$132.1bn (32% y/y), a slight deceleration from 37% y/y in 1Q23 as some of the cost optimizations from clients seen in 1Q started to abate and began to invest in more workloads. Some recent news around AI, especially AMZN's investment in Anthropic, as well as investments in more powerful GPUs and further development of in-house chips, and more foundation models added to Bedrock gives us confidence that AMZN can get back to growth acceleration and remain the top player in the industry (although they were a little late to AI relative to GOOG and MSFT).

**GOOG:** The Google Cloud segment grew 28% y/y in 2Q23 and was pretty stable sequentially (28.1% y/y in 1Q23). The segment is now at a ~\$28bn revenue run-rate with room to grow. The GCP segment within Cloud continues to grow faster than overall Cloud, and Cloud hit an important inflection point in 1H23 by turning to positive operating profit. As we've seen in the past few CIO surveys, Google Cloud remains a strong #3 preference as a cloud provider and gained some traction with respondents in this survey, but still trails Azure and AWS by a wide margin. As the push towards AI increases and more companies look to invest workloads into these new projects, we see GOOG as being a winner given its strong position in the AI space. We could see more clients moving some spend to Google Cloud as they look to differentiate with AI. GOOG mentioned last Q that over 70% of Gen AI "unicorns" are Cloud customers due to its infrastructure's AI capabilities. As noted above, the Google Cloud segment hit positive operating

profit in 1Q23 and was at +4.9% operating margin in 2Q23. AWS is at +24.2% operating margin, so we still see some runway for Cloud profit going forward.

## U.S. IT Services

Ramsey El-Assal, BCI, US | Ryan Campbell, BCI, US

### Sector Implications

Our overall survey results outline a more-optimistic outlook, with participants indicating IT spending would increase +3.1% in 2024, up from +2.2% in 2023. On one hand, we believe a “post-COVID” pull forward of demand had pressured IT spend in FY23, while on the other hand, the cyclical nature of the space has weighed on the pace of decision-making. With that being said, we believe clients are looking to resume some level of spend in FY24, but may likely remain cautious for the remainder of FY23. In our 2H22 and 1H23 surveys we saw a shift in responses towards cost-cutting initiatives and security expertise, which we believe was driven by an increasingly cautious stance in the face of a potential macro downturn. Since then, we have seen a slight shift back towards digital transformation, with implementing/upgrading ERP or other software, applying analytics, and managing risk seeing an improvement. While an uncertain macro overhang remains, we believe IT Services clients may find their footing and will look to increase spend in FY24. Lastly, we believe recent announcements surrounding Generative AI have driven CIOs towards upgrading and modernizing core systems in order to be prepared for the potential opportunity.

### Stock Implications

Our survey indicates Accenture as the best positioned in our coverage to benefit from continued demand to help corporates navigate a volatile macro-environment through a mix of cost-cutting initiatives and digital transformation work.

**ACN:** As global economies continue to recover at varying paces, we believe ACN is well-positioned given the company’s balanced exposure to various markets, industry groups, and service types. ACN recently guided top-line growth of 2-5% y/y on a C/C basis for FY24, though, we note, this guidance does not contemplate an improvement in discretionary spend or the macro environment, which we view as a conservative approach. That being said, our survey shows “implementing/upgrading ERP, or other software/systems” upgrading core systems to be a higher priority for corporates with ~17% (up from 12%) of companies indicating the need for it. We believe this bodes well for ACN as clients resume digital transformation and prepare for Generative AI opportunities.

**CTSH:** While the company has a slight majority in revenues coming from digital channels, we continue to see CTSH as having greater relative exposure to declining legacy services. That being said, our survey indicated a healthy increase in interest for CTSH’s services in 2H23 compared to 1H23. With the new management team now in place, we believe investors are increasingly focused on CTSH’s ability to capture demand as it returns and accelerate growth in FY24.

**EPAM:** The company derives ~75% of revenues from software development, and while these types of project-based revenues are generally more cyclical we think the company has differentiated itself as a high-end provider of outsourced software development services. While our survey only shows a modest increase for new contracts or expanded scope with EPAM in 2H23, we believe the increased need for upgrading core systems will generate additional opportunities for the company. However, we believe there may continue to be cause for customer concern in the near-term—whether justified or not—given EPAM’s exposure to Ukraine.

**RXT:** The company is primarily a cloud services provider, and based on our survey we see a slight decline in demand for RXT's services, as 92%/80% of respondents said public/private cloud spending budgets would be flat or up in 2023. RXT's number of favorable responses when being selected/strongly considered for new contracts/expansion work was flat, which we attribute to continued caution on IT spend.

## U.S. Information Services

**Manav Patnaik**, BCI, US | **Brendan Popson**, BCI, US

### Sector Implications

The CIO survey continues to show a slower 2023 (+2.2% vs. +2.3% prior), but it did not worsen materially and could be a bottom with 2024 expectations of +3.1%. Meanwhile, vertical mix dynamics are starting to turn more positive now for our Information Services space, with the most important vertical (Financial Services) maintained for 2023 (+2.8%) and better for 2024 (+3.3%). Geographic and size is mixed for Info, with EMEA a point worse than North America (more N.A. skewed) but large budget departments less confident than smaller budget ones.

### Stock Implications

*Gartner (ticker: IT)*. While the overall IT spending number is more geared toward tech spend (vs. research spend), we also ask directly about research and Gartner-specific spend (Question 17). For 2H23, 1H23, 43% of CIOs said they are looking to decrease Gartner seats, or offerings, or both over the NTM (vs. 47% prior), but only 6% are looking at increasing and 51% see no changes. The net -37% is 6 points worse than the prior survey. This deteriorating outlook has shown recently with IT's CV slowdown, with net contract value increase (NCVI) down >30% y/y in 1H23. As a reminder, Gartner is a per-seat sales model.

Lastly, note that our info services names are increasingly discussed as possible winners (or losers) with the rapid growth in AI/ML spend. The key theme is that data's value, if properly walled off, is only enhanced by AI/ML, although data that is not proprietary may have less value by itself and must be rolled into a comprehensive solution (i.e. software, analytics, workflow tools) to maintain its value. We have focused on AI and other emerging technology applications for the Info space in our "Talking Emerging InfoTech" series, including with the following notes:

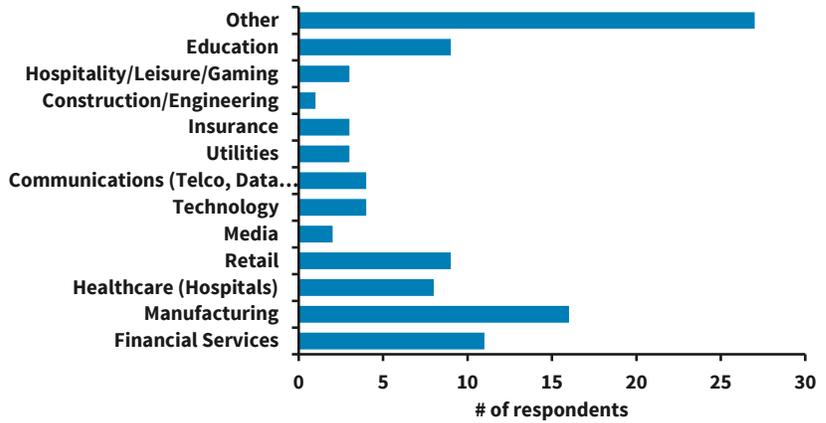
- **MSCI Inc. (MSCI):** *CTO call highlights early benefits of technology transformation efforts*, 03/31/22
- **Credit Bureaus (EFX/TRU):** *BIPS of Info: Cybersecurity - 5 must-read takeaways from EFX/ITRC call*, 1/29/21
- **Thomson Reuters (TRI):** *TRI's (Westlaw) Edge using AI*, 3/19/19
- **Equifax (EFX):** *More on xAI - EFX's recently awarded patent*, 12/4/18; *CTO call highlights LT growth potential*, 02/23/22
- **Fair Isaac (FICO):** *Explainable AI & a look at FICO's work*, 11/20/18
- **S&P Global (SPGI):** *AI bringing SPGI to a State of Kensho*, 6/19/18
- **TransUnion (TRU) and Dun & Bradstreet (DNB):** *TRU/DNB: How a TRU tech overhaul can help DNB 'grow relationships thru data'*, 1/23/18

## Appendix: CIO Survey Demographics

### CIO Survey – In what industry vertical does your company participate?

The base of respondents surveyed represents a broad cross section of global industries. Verticals providing the highest number of respondents were Financial Services (11%), Manufacturing (16%), Retail (9%), Education (9%), and Healthcare (8%). One limitation to our survey base is that government entities and small/medium size businesses (SMBs) have more limited representation.

**FIGURE 33. Barclays CIO Survey – Industry Demographics (Number of 100 respondents by industry vertical)**

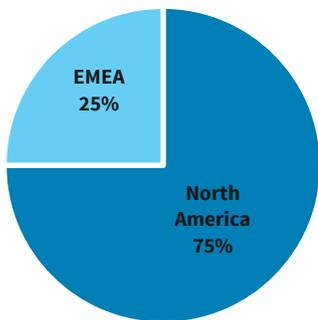


Source: Barclays CIO Survey program.

### CIO Survey – In what region does the largest portion of your company’s IT spending occur?

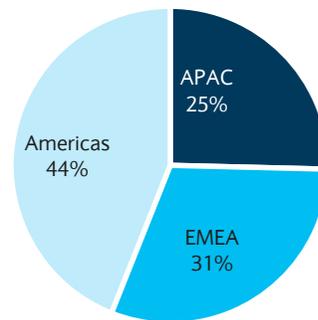
As illustrated in the below figure, our CIO survey focused on North America (75%) and EMEA (25%) with no exposure to APAC and Latin America. As reference, according to market research firm Gartner, in 2018 North America represented 44% of IT spending, with EMEA at 31% and Asia-Pacific & ROW at 25%.

**FIGURE 34. Barclays CIO Survey – More Concentrated on North America IT Spending**



Source: Barclays CIO Survey program.

**FIGURE 35. Spending By Geography Is More Balanced on a Global Basis versus Our Survey**



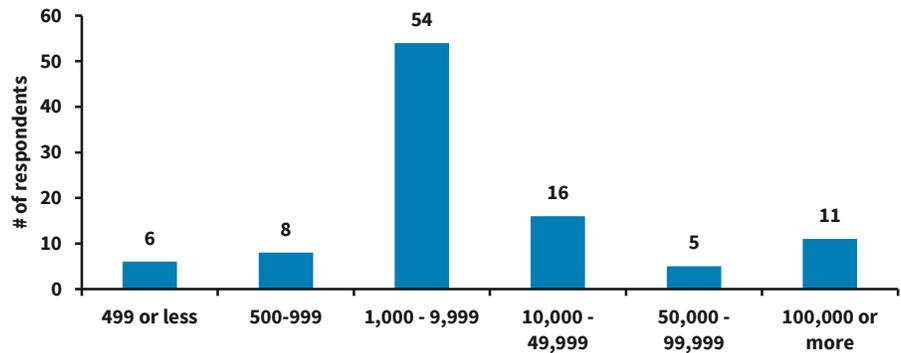
Source: Barclays Research, Gartner.

### CIO Survey – How many full-time employees work at your company?

As illustrated below, our CIO survey is more exposed to medium- to large-enterprises, defined as companies with more than 1,000 employees. 14 respondents were from companies with fewer

than 1,000 employees. Companies with 1,000-9,999 employees comprised the largest portion of our survey base (54 respondents), followed by those with 10,000-49,999 employees (16).

**FIGURE 36. Barclays CIO Survey – Medium to Large Employee Bases Underpin Survey Base (Number of 100 respondents by employee count)**

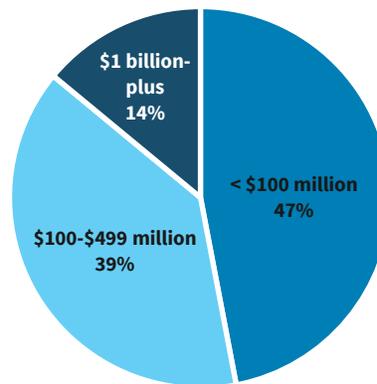


Source: Barclays CIO Survey program.

### CIO Survey – What is the size of your company’s annual IT spending budget?

Of the 100 respondents, 47 had budgets under \$100M at their disposal, 39 had budgets of \$100-\$499M, and 14 deployed >\$1Bn.

**FIGURE 37. Barclays CIO Survey – Decent Coverage of Medium to Large-sized IT Budgets (% of respondents having IT Budgets in certain dollar buckets)**



Source: Barclays CIO Survey program.

**Analyst(s) Certification(s):**

We, Raimo Lenschow, CFA, Manav Patnaik, Ross Sandler, Saket Kalia, CFA, Ramsey El-Assal and Tim Long, hereby certify (1) that the views expressed in this research report accurately reflect our personal views about any or all of the subject securities or issuers referred to in this research report and (2) no part of our compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this research report.

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**Materially Mentioned Stocks (Ticker, Date, Price)**

**Accenture, Inc.** (ACN, 05-Oct-2023, USD 309.66), Overweight/Positive, CE/J/K/M/N

**Alphabet Inc.** (GOOGL, 05-Oct-2023, USD 135.07), Overweight/Positive, CD/CE/E/J/K/L/M/N

Other Material Conflicts: One of the analysts in the Equity-Linked Research Team (and/or a member of his or her household) has a long position in the common stock of Alphabet, Inc (GOOGL).

**Amazon.com, Inc.** (AMZN, 05-Oct-2023, USD 125.96), Overweight/Positive, A/CD/CE/D/E/J/K/L/M/N

**Arista Networks, Inc.** (ANET, 05-Oct-2023, USD 188.03), Overweight/Neutral, CE/J

**Check Point Software Technologies Ltd.** (CHKP, 05-Oct-2023, USD 134.80), Equal Weight/Positive, CE/J

**Cisco Systems, Inc.** (CSCO, 05-Oct-2023, USD 53.07), Equal Weight/Neutral, CD/CE/J

**Cognizant** (CTSH, 05-Oct-2023, USD 67.70), Underweight/Positive, CE/D/J/K/L/M/N

**CrowdStrike Holdings, Inc** (CRWD, 05-Oct-2023, USD 165.29), Overweight/Positive, CD/CE/J

**CyberArk Software** (CYBR, 05-Oct-2023, USD 158.00), Overweight/Positive, CD/CE/FA/J/K/N

**Dell Technologies Inc.** (DELL, 05-Oct-2023, USD 66.19), Underweight/Neutral, A/D/E/J/K/L/M/N

**EPAM Systems** (EPAM, 05-Oct-2023, USD 238.01), Equal Weight/Positive, CE/J/K/N

**Fortinet, Inc.** (FTNT, 05-Oct-2023, USD 58.02), Overweight/Positive, CD/CE/J

**Gartner Inc.** (IT, 05-Oct-2023, USD 352.14), Equal Weight/Neutral, CD/J

**HP Inc.** (HPQ, 05-Oct-2023, USD 26.23), Underweight/Neutral, CD/CE/J/K/M/N

**Hewlett Packard Enterprise Company** (HPE, 05-Oct-2023, USD 16.79), Equal Weight/Neutral, A/CD/CE/D/E/FA/J/K/L/M

**Juniper Networks, Inc.** (JNPR, 05-Oct-2023, USD 26.47), Overweight/Neutral, CD/CE/D/FB/J/K/L/M

**Microsoft Corp.** (MSFT, 05-Oct-2023, USD 319.36), Overweight/Positive, CD/CE/D/E/J/K/L/M/N

**NetApp, Inc.** (NTAP, 05-Oct-2023, USD 75.52), Equal Weight/Neutral, CD/CE/J

**Oracle Corp.** (ORCL, 05-Oct-2023, USD 108.35), Overweight/Positive, CD/CE/J/K/M/N

**Palo Alto Networks** (PANW, 05-Oct-2023, USD 236.78), Overweight/Positive, CD/CE/E/FA/J/K/L/M

**Pure Storage, Inc.** (PSTG, 05-Oct-2023, USD 34.44), Overweight/Neutral, CE/FB/J/K/M

**Rackspace Technology, Inc.** (RXT, 05-Oct-2023, USD 1.76), Underweight/Positive, CE/J

**Rapid7** (RPD, 05-Oct-2023, USD 46.12), Equal Weight/Positive, CD/CE/E/FA/J/L

**Salesforce.com Inc.** (CRM, 05-Oct-2023, USD 202.01), Overweight/Positive, CD/CE/J/K/M

**SentinelOne, Inc.** (S, 05-Oct-2023, USD 16.28), Equal Weight/Positive, CE/FB/J

**ServiceNow, Inc.** (NOW, 05-Oct-2023, USD 547.17), Overweight/Positive, CD/CE/J

**Snowflake Computing** (SNOW, 05-Oct-2023, USD 150.25), Overweight/Positive, CE/FB/J

**Tenable Holdings Inc** (TENB, 05-Oct-2023, USD 44.39), Overweight/Positive, CE/J

**Teradata Corp.** (TDC, 05-Oct-2023, USD 45.10), Underweight/Positive, CE/J

**Zscaler, Inc.** (ZS, 05-Oct-2023, USD 153.30), Equal Weight/Positive, CD/CE/D/E/FB/J/K/L/M

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DLocal Limited (DLO)	EPAM Systems (EPAM)	Fidelity National Information Services (FIS)
Fiserv, Inc. (FI)	Fleetcor Technologies (FLT)	Global Payments Inc. (GPN)
Green Dot Corp. (GDOT)	Marqeta, Inc. (MQ)	Mastercard Inc. (MA)
PagSeguro Digital Ltd. (PAGS)	Paychex, Inc. (PAYX)	PayPal, Inc. (PYPL)
Rackspace Technology, Inc. (RXT)	Remitly Global, Inc. (RELY)	Repay Holdings Corp. (RPAY)
Riskified Ltd. (RSKD)	StoneCo Ltd. (STNE)	TELUS International (Cda) Inc. (TIXT)
Upstart Holdings Inc. (UPST)	Visa Inc. (V)	Western Union (WU)
WEX, Inc. (WEX)		

**IT Hardware and Communications Equipment**

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CDW Corp. (CDW)	Ciena Corporation (CIEN)	Cisco Systems, Inc. (CSCO)
Corning Incorporated (GLW)	Corsair Gaming, Inc. (CRSR)	Dell Technologies Inc. (DELL)
F5, Inc. (FFIV)	Flex Ltd (FLEX)	Garmin (GRMN)
Harmonic, Inc. (HLIT)	Hewlett Packard Enterprise Company (HPE)	HP Inc. (HPQ)
Jabil (JBL)	Juniper Networks, Inc. (JNPR)	Keysight Technologies, Inc. (KEYS)
Logitech (LOGI)	Motorola Solutions, Inc. (MSI)	NetApp, Inc. (NTAP)
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TransUnion (TRU)

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Cintas Corp. (CTAS)

Ecolab Inc. (ECL)

Fair Isaac Corp. (FICO)

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MSCI Inc. (MSCI)

Sterling Check Corp. (STER)

UniFirst Corporation (UNF)

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Duolingo, Inc. (DUOL)

Etsy Inc (ETSY)

Groupon, Inc. (GRPN)

Lyft, Inc. (LYFT)

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GoDaddy Inc. (GDDY)

LegalZoom.com, Inc. (LZ)

MercadoLibre (MELI)

Nerdy, Inc. (NRDY)

Pinterest, Inc. (PINS)

Roblox Corporation (RBLX)

Squarespace, Inc. (SQSP)

ThredUp Inc. (TDUP)

Unity Software Inc. (U)

Ziff Davis Inc (ZD)

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BigCommerce (BIGC)

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