



Tracking the Cloud Computing Industry: Infrastructure SaaS

Nasdaq Redpoint Cloud Infrastructure
Software™ Index (NQRPCI™)

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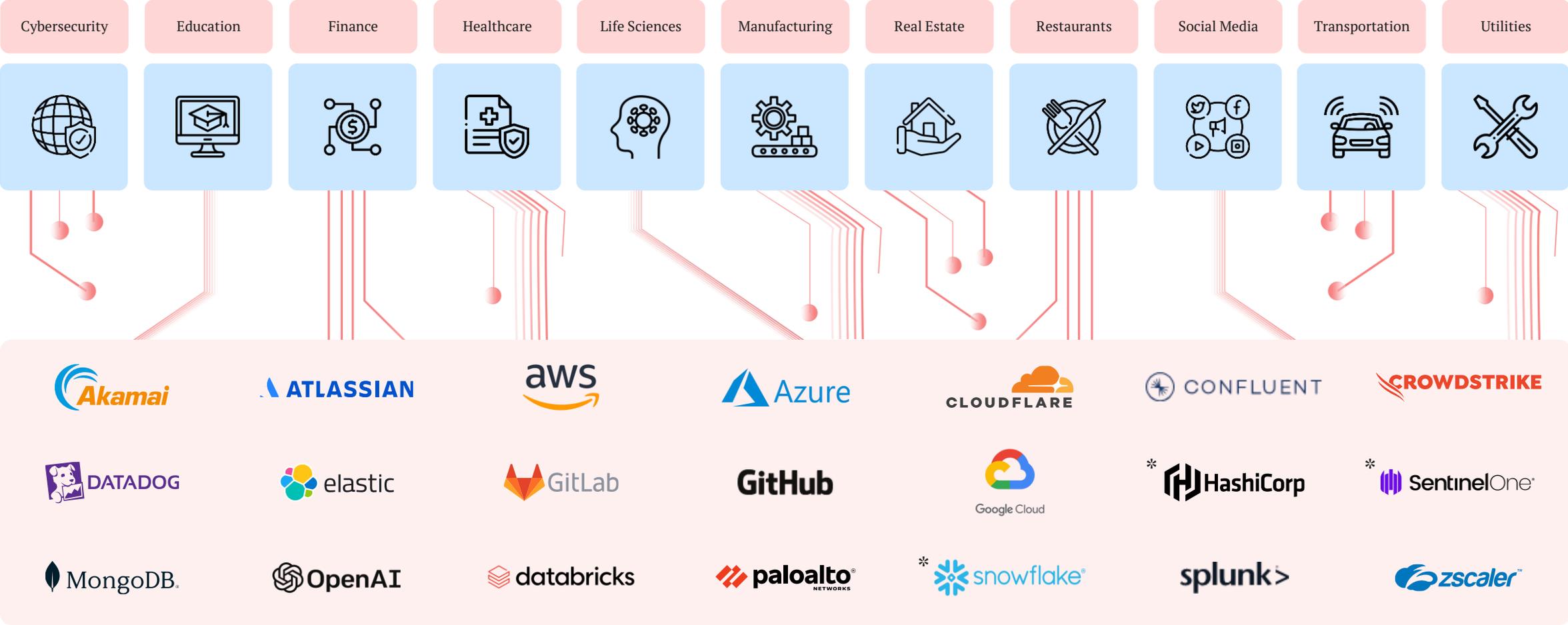
We interact with dozens of apps



These apps are supported by a layer of invisible technology

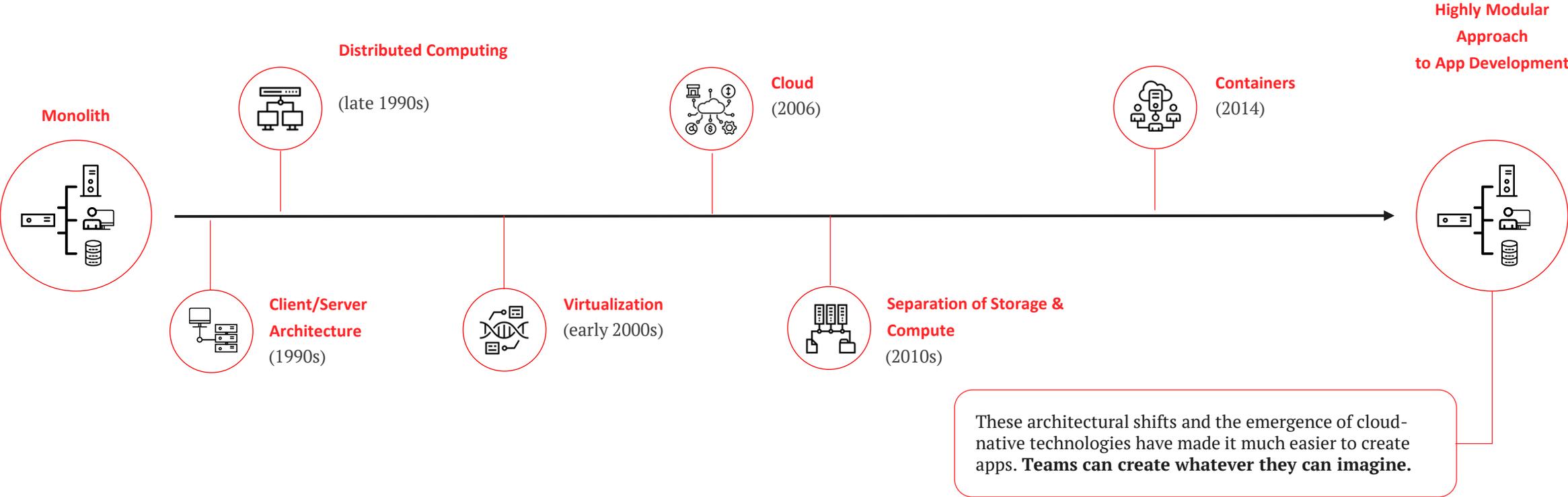


This layer is infrastructure software, and it powers virtually everything



A quick history through the evolution of infrastructure software

There have been key architectural shifts in developing applications over the last 25 years



So what?

2000: Pre-Cloud

Highly Centralized

There were huge barriers to entry; app development cost millions of dollars in software, hardware, and personnel. These monolith systems were unscalable and unreliable.

ORACLE

SAP

IBM

2010: Lift and shift

Unrealized Potential

Taking packaged software and running it in the cloud came with a host of problems related to software compatibility, data loss, and downtime. Teams never reaped the benefits of the cloud like multitenancy, rapid elasticity, scalability, and resiliency.

Azure

Google Cloud

Amazon S3

Amazon EC2

vmware®

Today: Cloud-native

Full Power of the Cloud

Technologies are built and optimized for the cloud. Doing so makes it dramatically easier to create apps. Building this critical layer unlocks the full potential and benefits of the cloud, and in the process creates exceptional businesses.

CROWDSTRIKE

mongoDB®

GitHub

HashiCorp

DATADOG

CONFLUENT

snowflake®

Three major categories within cloud infrastructure



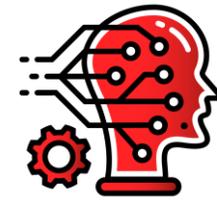
DevOps & Developer Tools

DevOps is a vital catalyst for software innovation, providing a robust set of solutions to improve collaboration and time-to-market in the software delivery process. This category encompasses the entire spectrum from initial code design to production monitoring.



Cybersecurity

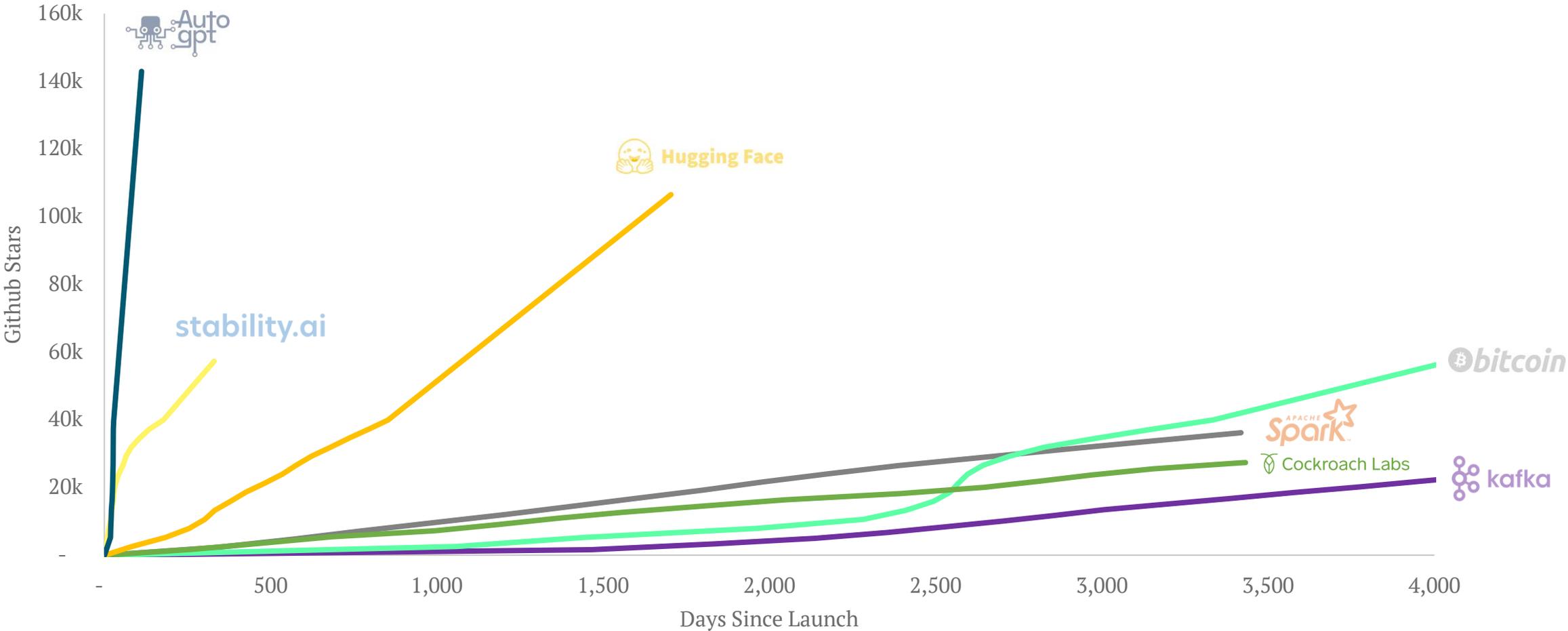
Cybersecurity vendors empower CISOs to safeguard their organizations from an ever-increasing number of attacks. These products are designed to detect, prevent, and mitigate cyber threats and vulnerabilities.



Data & Observability

This infrastructure serves as the central building blocks for data storage, consumption, and sharing. Data & AI are closely related, as ML models and systems can only be as good as their underlying data. A wave of ML infrastructure tooling has emerged to push us into the age of AI.

AI attracts unprecedented developer adoption



AI is everywhere today



Launched a generative AI marketplace for video game developers



Launched “AI DJ” to create playlists for each listener



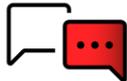
Introduced a shopping assistant powered by GPT



Released Charlotte AI, a natural language bot to query customers' data



Released a conversational AI bot to teach students



Integrated AI-powered conversation summaries and writing assistance



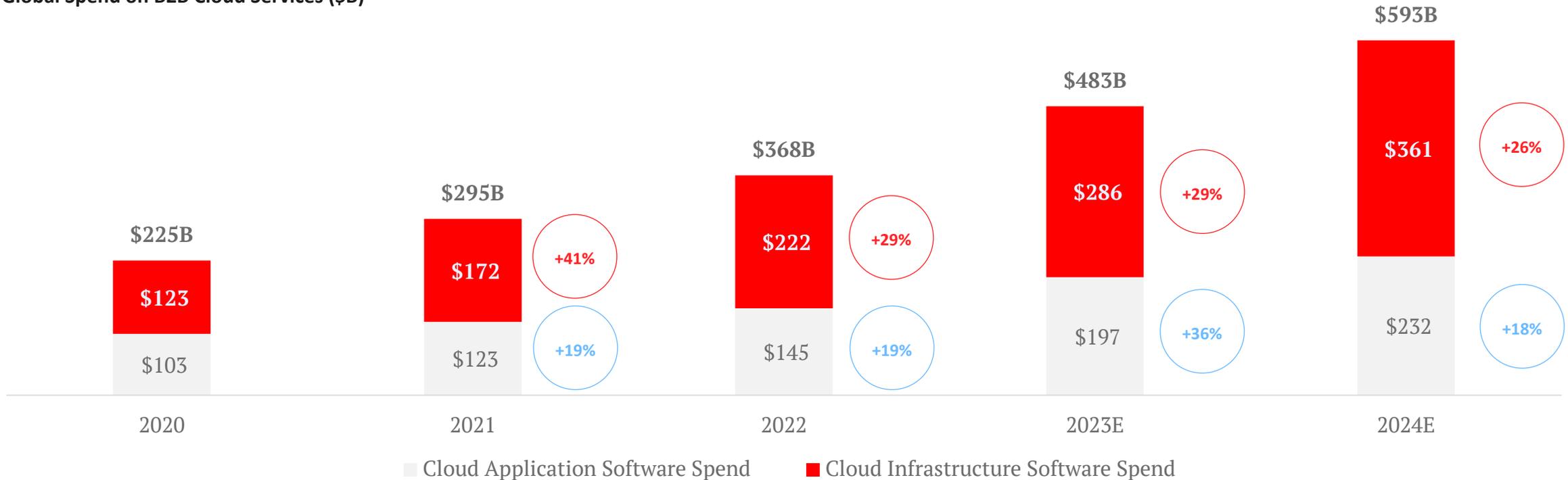
Released Copilot, an AI-pair programmer that offers autocomplete suggestions

Cloud Infrastructure by the Numbers



Relative to app software, infra software is a larger and faster-growing market

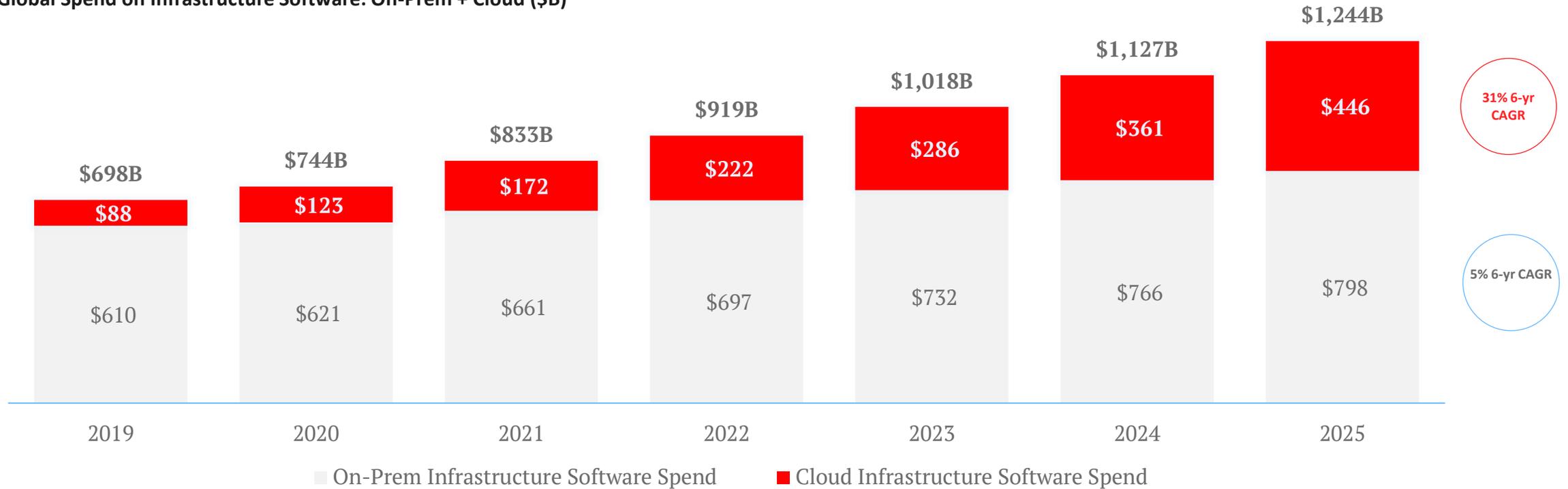
Global Spend on B2B Cloud Services (\$B)



Most of global B2B cloud expenditure is allocated towards cloud infrastructure. In comparison to application software, infrastructure software has a larger addressable market that is growing faster.

Reallocating \$1T+ of infrastructure spend with the transition to cloud

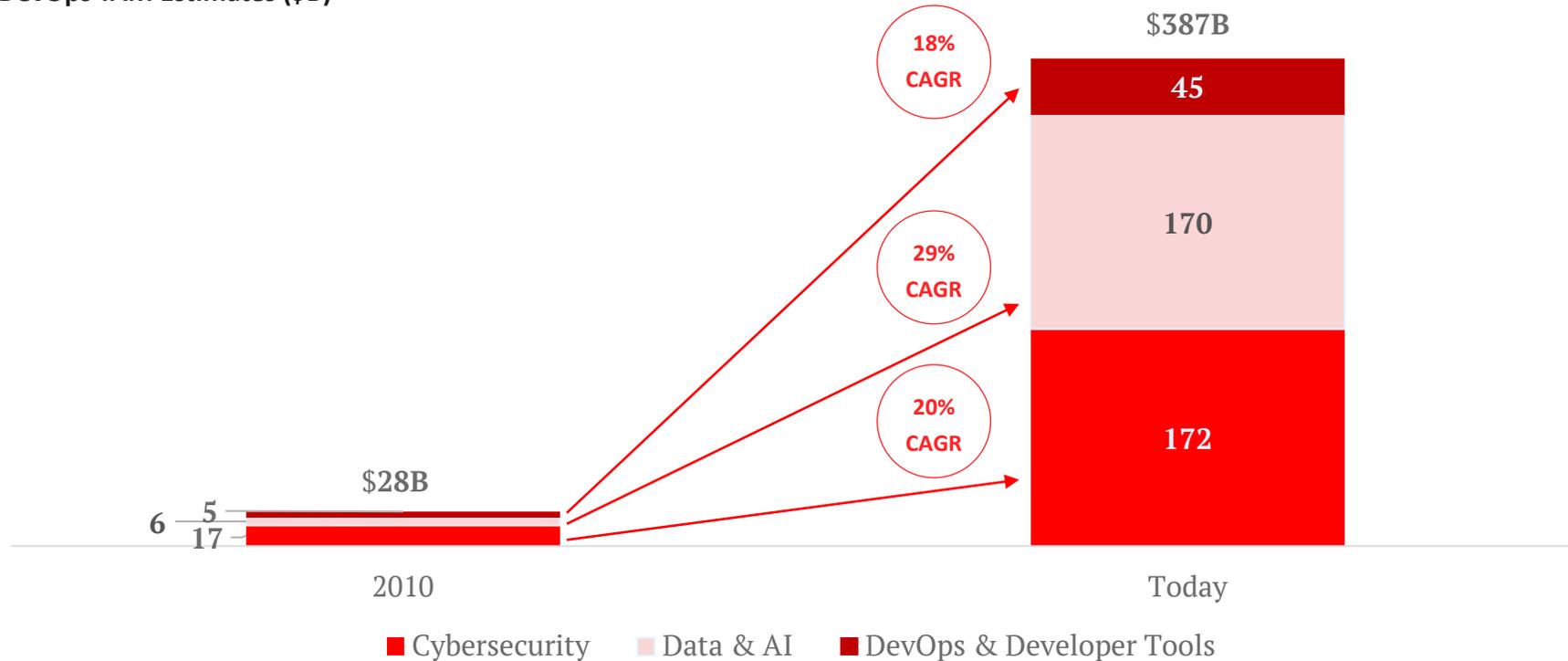
Global Spend on Infrastructure Software: On-Prem + Cloud (\$B)



Amidst the growth of the broader infrastructure market, spend on cloud-based infrastructure has exploded. There remains a significant amount of legacy, on-prem spend that will be unlocked with the cloud.

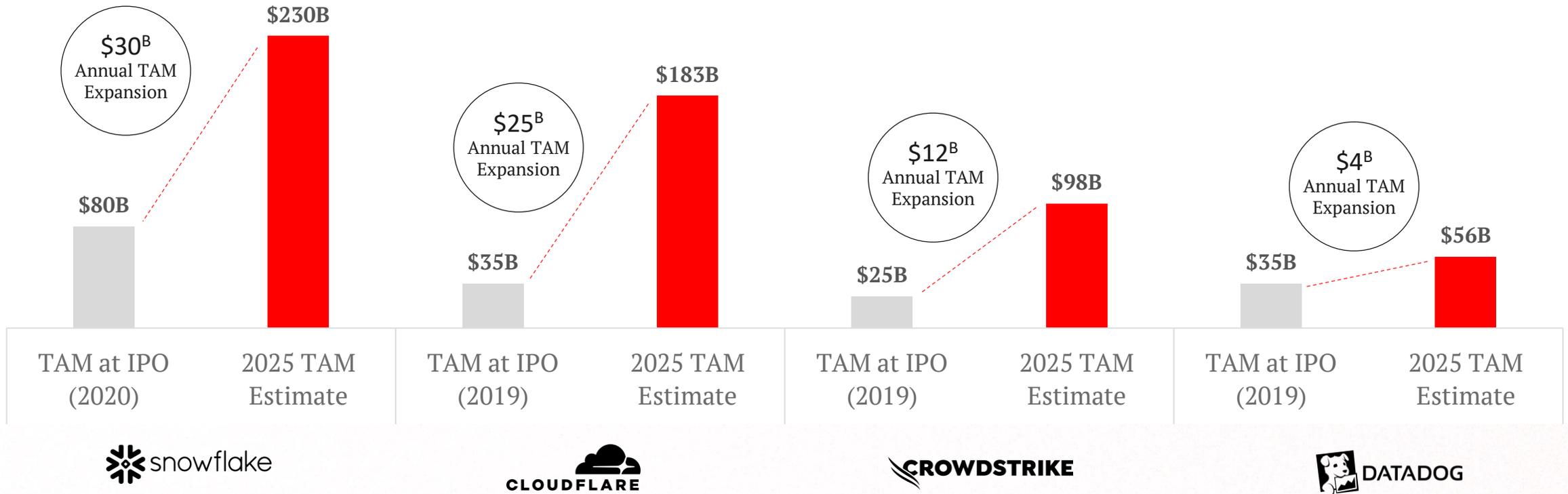
Each category within cloud infrastructure is getting bigger

Cybersecurity, Data, and DevOps TAM Estimates (\$B)



Each category within infrastructure software is witnessing unprecedented growth, demonstrating significant potential to support an ever-increasing number of standalone businesses.

Rapid TAM expansion for infrastructure vendors

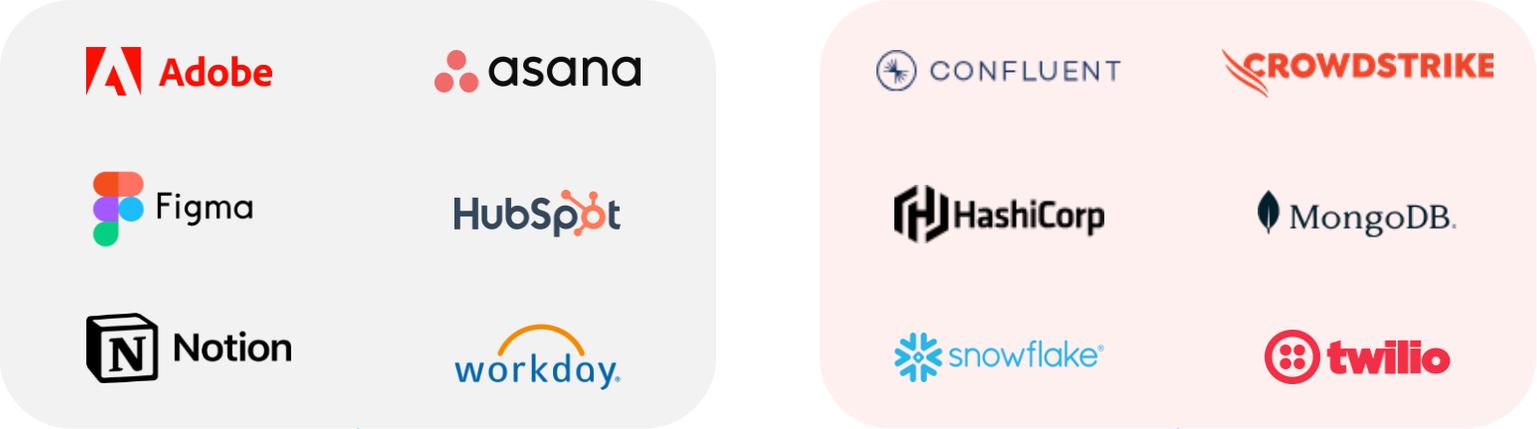


Analysts have significantly raised TAM estimates for infrastructure software businesses following their IPO, indicating substantial growth potential for these companies.

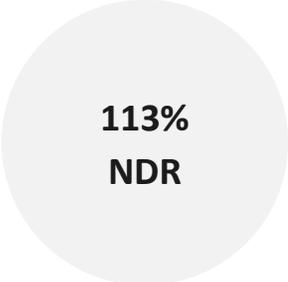
The power of usage-based pricing

Seat-Based Pricing

Usage-Based Pricing



Application SaaS



Infrastructure SaaS

Infrastructure SaaS businesses typically employ usage-based pricing while application SaaS vendors often charge on the number of seats.

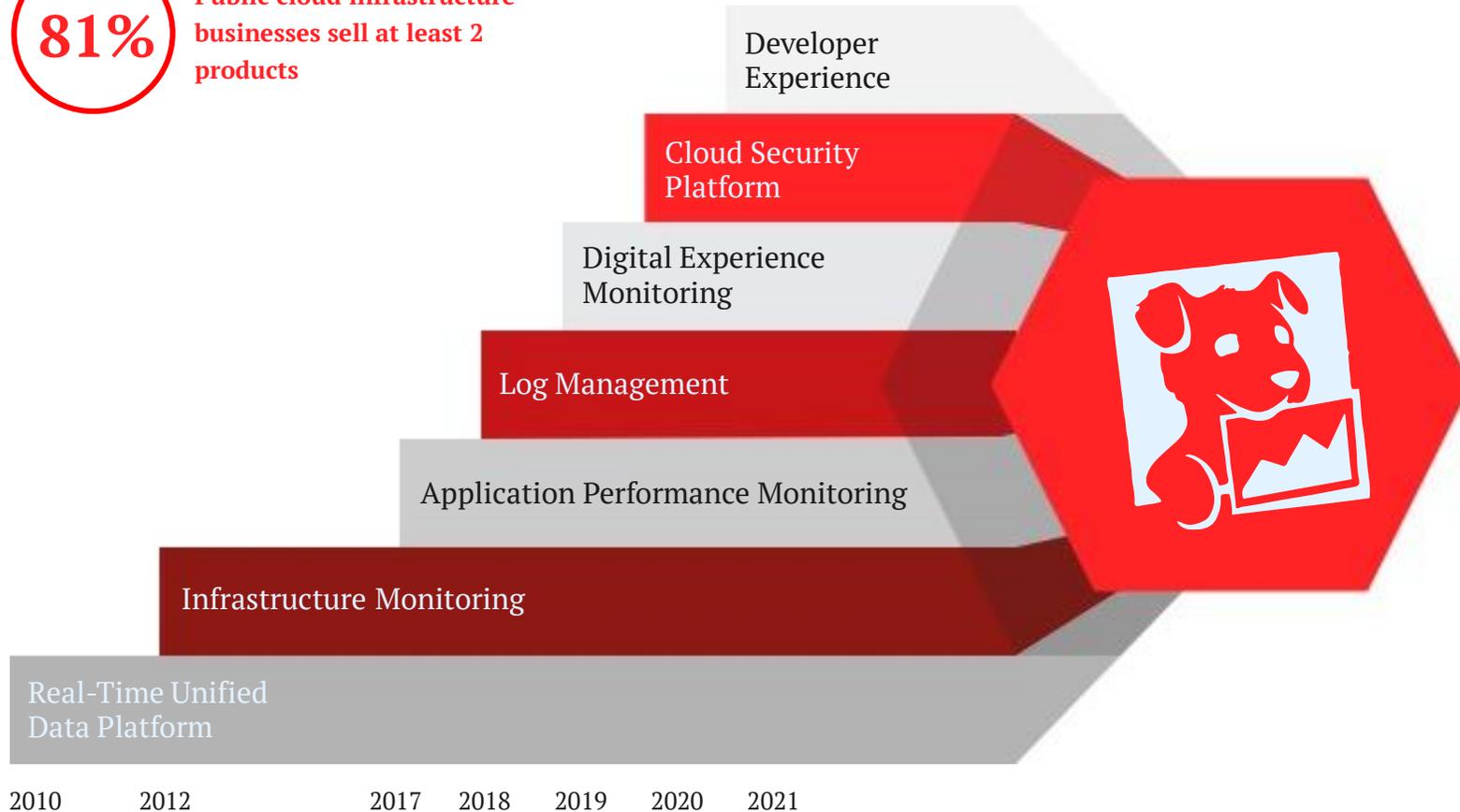
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The appeal of usage-based pricing model is that it is intrinsically connected to the success of your customers. Pricing is based on delivered value. Increasing consumption and higher NDRs suggest greater value creation.

Infrastructure companies build true platforms

81%

Public cloud infrastructure businesses sell at least 2 products



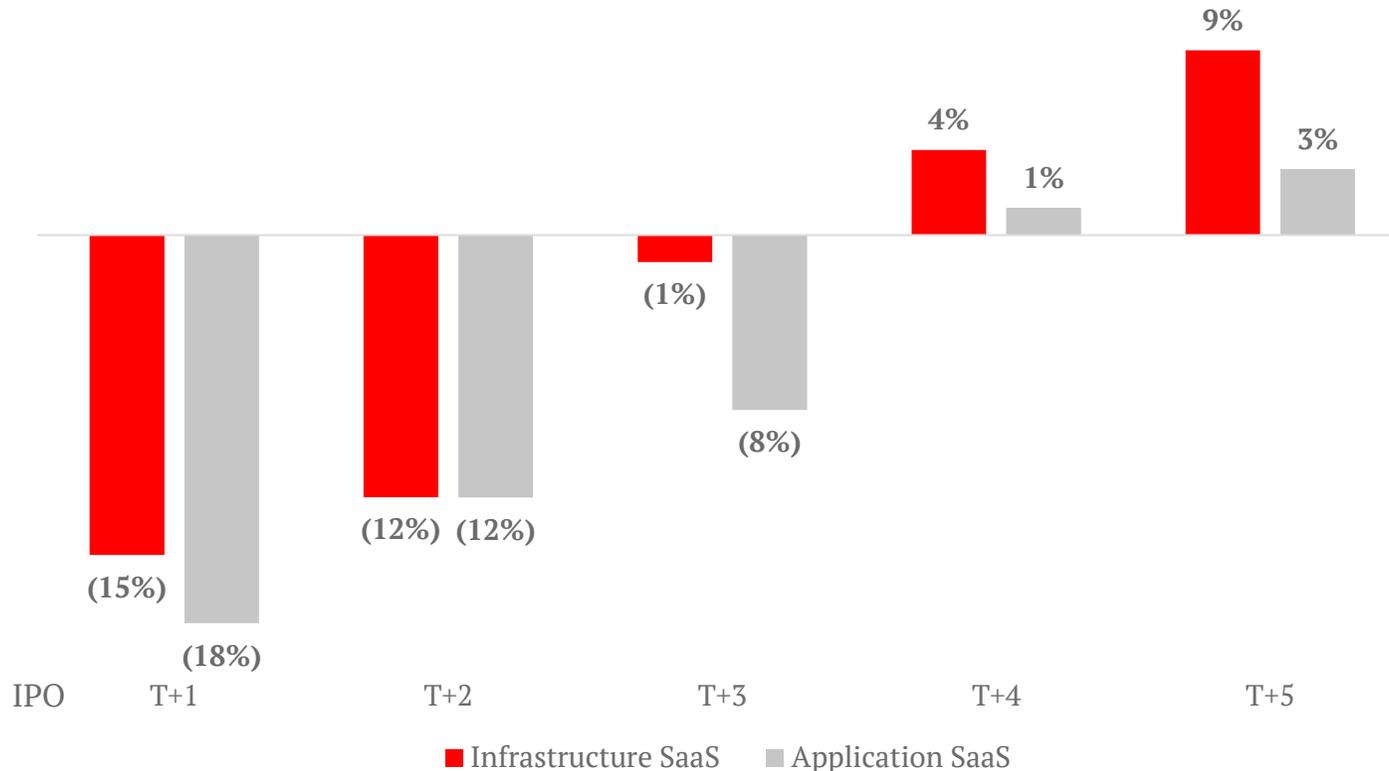
The cloud enables vendors to build platforms with greater ease. Enabling new features and products is as straightforward as activating software and no longer a massive undertaking.



Over 80% of infrastructure software businesses sell at least two different products. **This allows infrastructure businesses to generate incremental revenue easier and faster.**

Infrastructure software is more profitable

Infrastructure Software Businesses Reach Profitability Faster (FCF Margin)



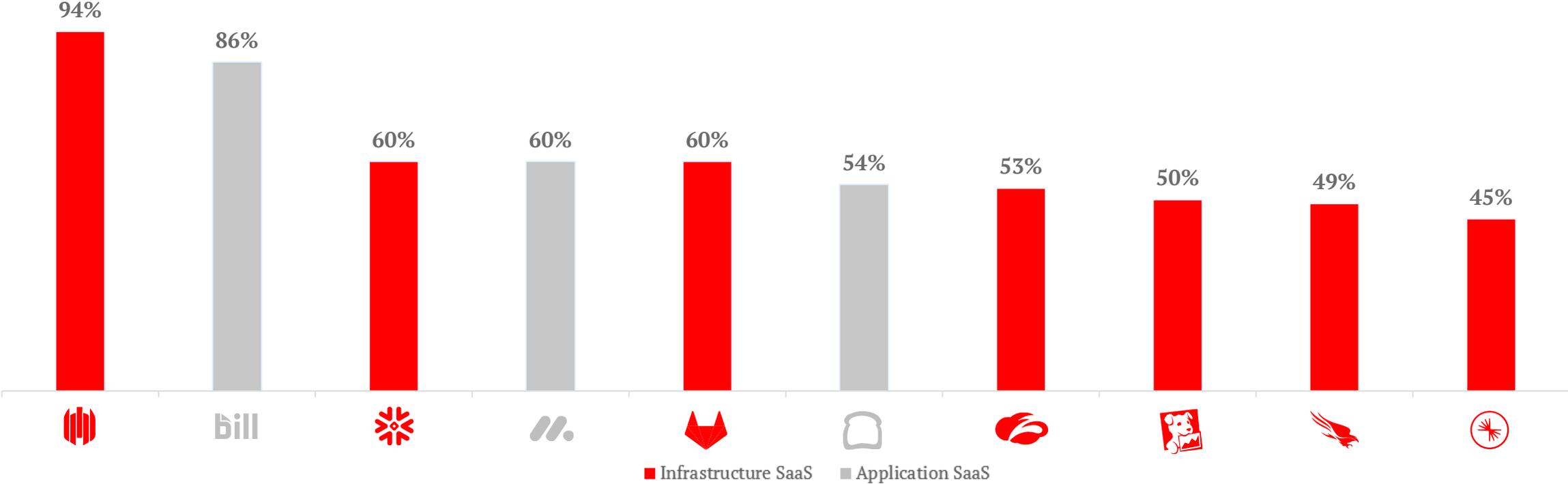
For a variety of reasons, infrastructure businesses are more profitable over the long-run, including:



- On average, infrastructure vendors sell into larger markets
- Customers spend more on infrastructure. Average ACVs are higher relative to that of application SaaS
- Some infrastructure businesses are open-source and can successfully harvest their bottoms-up base with minimal to no CAC

These dynamics create larger and faster-growing businesses

Public Enterprise Software Businesses with >\$500M ARR; ranked by LTM Growth Rate



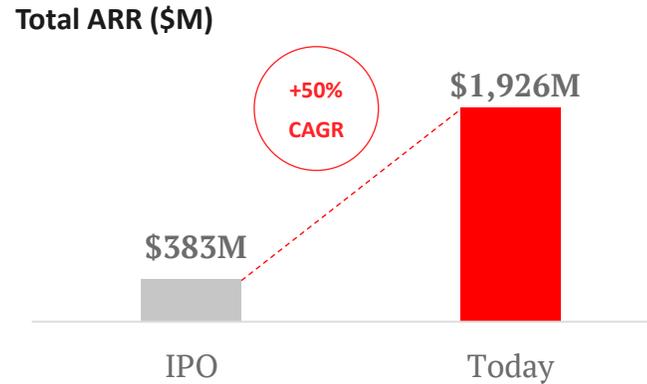
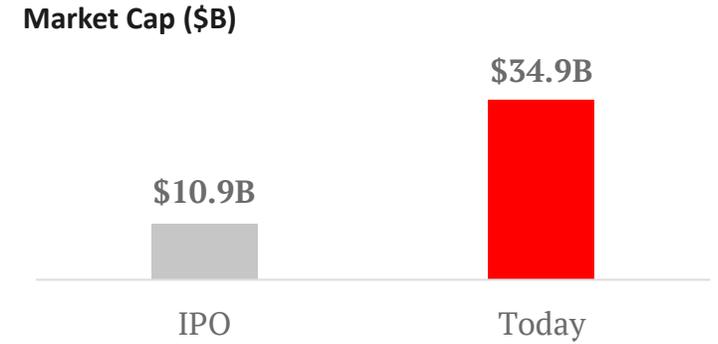
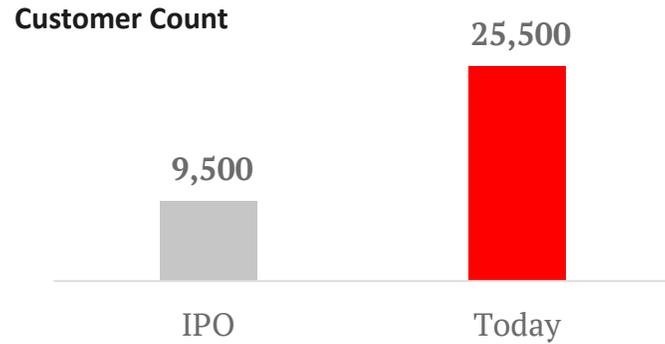
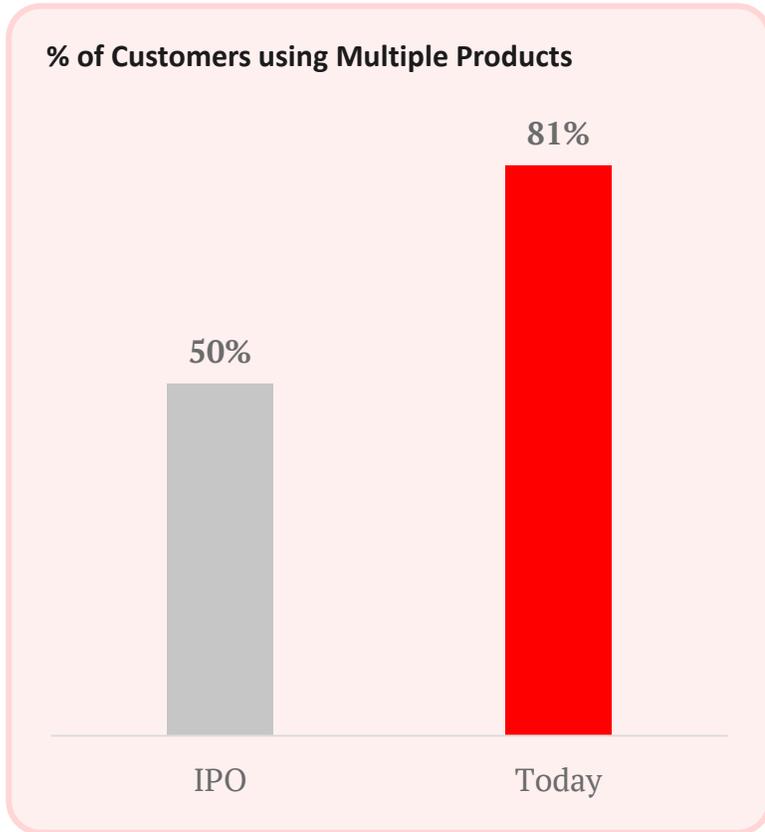
Among the top 10 fastest-growing SaaS businesses with over \$500M in ARR, 70% are infrastructure. This is driven by these vendors (1) operating in larger and faster-growing markets, (2) employing usage-based pricing and (3) having multiple products.

The likes of which we haven't seen



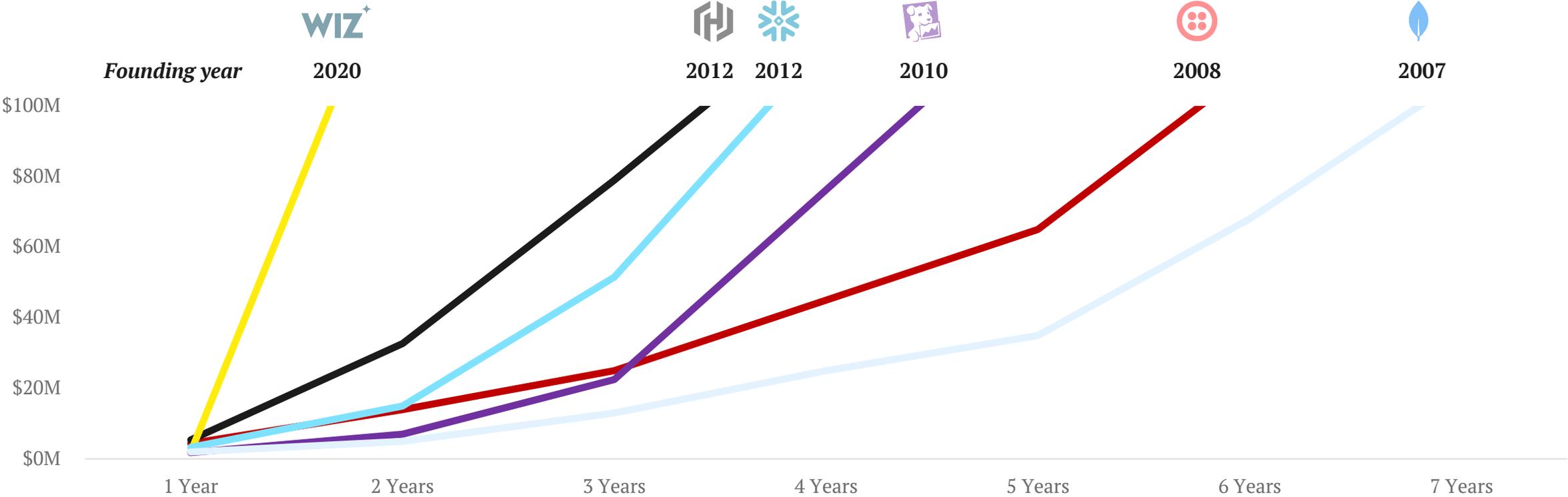
Not only are these infrastructure providers growing quickly, but they are growing quickly at scale. These kinds of ARR figures and growth are unprecedented.

Datadog: a case study



Since its IPO, Datadog has significantly increased its share of multi-product customers and more than doubled its customer base. This has supercharged revenue growth and profitability, creating billions of equity value.

Infrastructure vendors reach \$100M in ARR in record time



Infrastructure SaaS businesses are reaching the \$100M ARR mark at an accelerated pace.

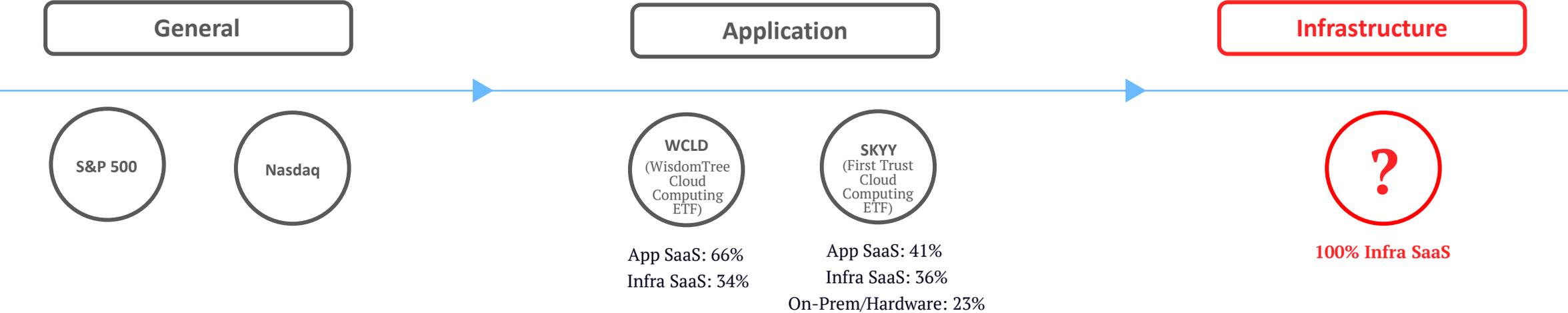
Infrastructure software as an asset class beats application software

	Application SaaS	Infrastructure SaaS		Application SaaS	Infrastructure SaaS
Market Cap (\$B)	\$4.5B	\$11.9B	FCF Margin	5%	9%
NTM Revenue Growth	16%	20%	Rule of 40	32%	44%
NDR	113%	120%	Multiple Return Since IPO	1.4x	2.9x

Infrastructure software outperforms application software across various metrics, driving outsized returns in the public markets.

Note: Data from company filings available as of July 14th, 2023. All calculations represent the median value. Infrastructure SaaS cohort: AKAM, TEAM, NET, CFLT, CRWD, DDOG, DOCN, DT, ESTC, GTLB, HCP, JAMF, FROG, MDB, NEWR, OKTA, PD, PANW, S, SNOW, SPLK, TENB, TWLO, PATH, ZS. Application SaaS cohort: AMPL, ALKT, BOX, BRZE, CRM, ADBE, APPF, APPN, ASAN, AXON, BIGC, BILL, BLKB, BL, BLND, CDAY, CWAN, LAW, DOCU, DOCS, DBX, ENFN, ESMT, EVBG, EXFY, FIVN, FRSH, HUBS, INST, LSPD, MNDY, NCNO, OLO, PLTR, PAYC, PYCR, PCTY, PWSC, PCOR, QTWO, RNG, IOT, SEMR, NOW, SHOP, SMAR, CXM, SPT, SQSP, TOST, VEEV, WKME, WEAV, WIX, WDAY, WK, ZM, ZI, ZUO. NTM revenue growth defined as % change between NTM revenue and LTM revenue, NDR defined as (Starting MRR + Expansion MRR - Contracted/Churned MRR) / Starting MRR x 100, FCF margin defined as cash generated by a firm in proportion to the revenue after the firm has met its financial obligations, Rule of 40 is defined as implied LTM revenue growth rate plus LTM FCF Margin, Multiple return since IPO is defined as latest price divided by direct listing price.

However, the market is missing a pure play cloud infrastructure index



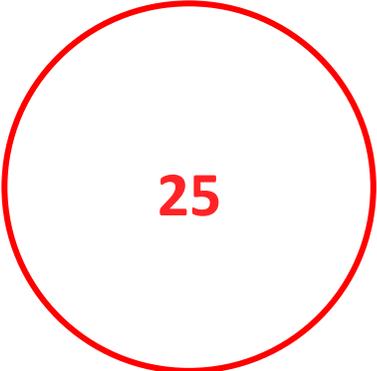
Current indices focus overwhelmingly on application SaaS or subcategories of infrastructure SaaS but fail to recognize infrastructure software as a standalone sector.

Nasdaq Redpoint Cloud Infrastructure Software Index (NQRPCI)

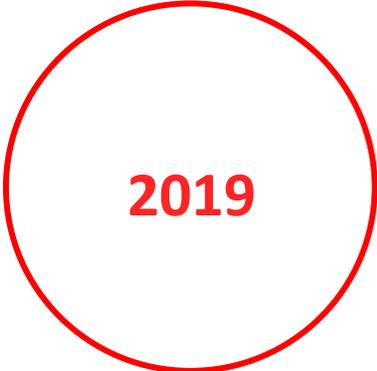
Overview



Overview of The Nasdaq Redpoint Cloud Infrastructure Software Index™



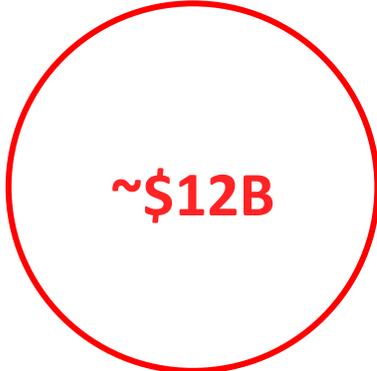
Businesses across
Cloud Infrastructure



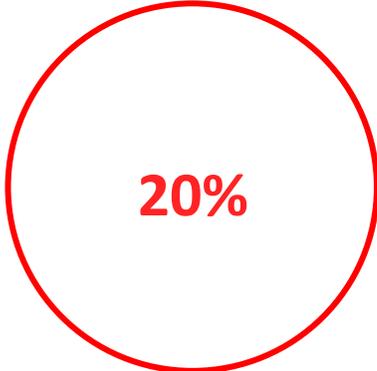
Median
IPO Date



Aggregate
Market Cap



Median
Market Cap



Median NTM
Growth Rate

25 companies across 3 verticals



DevOps & Developer Tools

Cybersecurity

Data & AI



Why Nasdaq for Cloud Infrastructure?

Nasdaq is recognized as a leader in innovation-driven technology, from both a listings and index perspective. It is home to the vast majority of U.S. listed technology companies. Nasdaq Global Indexes has built a premier offering in thematic indexing, leveraging unique partnerships with 3rd party research providers. The Nasdaq Redpoint Infrastructure Software Index (NQRPCI) is the only index in the market dedicated to tracking Infrastructure SaaS exclusively, while other cloud indexes provide exposure to both Application and Infrastructure software



More than 3,300 companies trade publicly on the Nasdaq
Nasdaq maintains 36 consecutive quarters of IPO leadership in US



Technology interwoven in the company's DNA providing a natural edge in branding/positioning



Multiple indexes in the cloud computing space, including Nasdaq's ISE CTA Cloud Computing™ and BVP Nasdaq Emerging Cloud™ indexes



Part of Nasdaq's industry-leading thematic technology index offerings



Nasdaq's Index Brand is Rooted in Technology & Innovation

Clean Energy/Energy Transition (Thematic ESG)

- Nasdaq Clean Edge Green Energy™ (CELS™/CELSI™/CELSEW™)
- Nasdaq Clean Edge Smart Grid Infrastructure™ (QGRD™)
- ISE Clean Edge Global Wind Energy™ (GWE™)
- Nasdaq CTA Global Climate Technology™ (CLMTCH™)

Cybersecurity

- ISE Cyber Security™ (HXR™)
- ISE Cyber Security UCITS™ (HUR™)
- Nasdaq CTA Cybersecurity™ (NQCYBR™)

AI / Robotics / Big Data

- Nasdaq CTA Artificial Intelligence™ (NQINTEL™)
- Nasdaq CTA AI and Robotics™ (NQROBO™)
- Nasdaq Global AI and Big Data™ (NYGBIG™)

Cloud Computing

- ISE CTA Cloud Computing™ (CPQ™)
- Nasdaq CTA International Cloud Computing™ (CPQI™)
- BVP Nasdaq Emerging Cloud™ (EMCLOUD™)
- Nasdaq Redpoint Cloud Infrastructure Software™ (NQRPCI™)

Internet / Gaming / Metaverse

- Nasdaq CTA Internet™ (QNET™)
- Nasdaq CTA EM Internet & e-Commerce™ (QNETEM™)
- Nasdaq CTA Global Video Games & eSports™ (PLAYER™)
- Nasdaq CTA Global Video Games Software™ (PLAYR2™)
- Nasdaq CB Insights Metaverse™ (NCMETV™/NCMETA™)

Innovation Suite + Broad Disruptive Tech

- Nasdaq-100® (NDX®) + Nasdaq Next Generation 100™ (NGX™)
- Nasdaq Innovators Completion Cap™ (NCX™)
- Nasdaq Disruptive Tech Benchmark™ (NYDTB™)

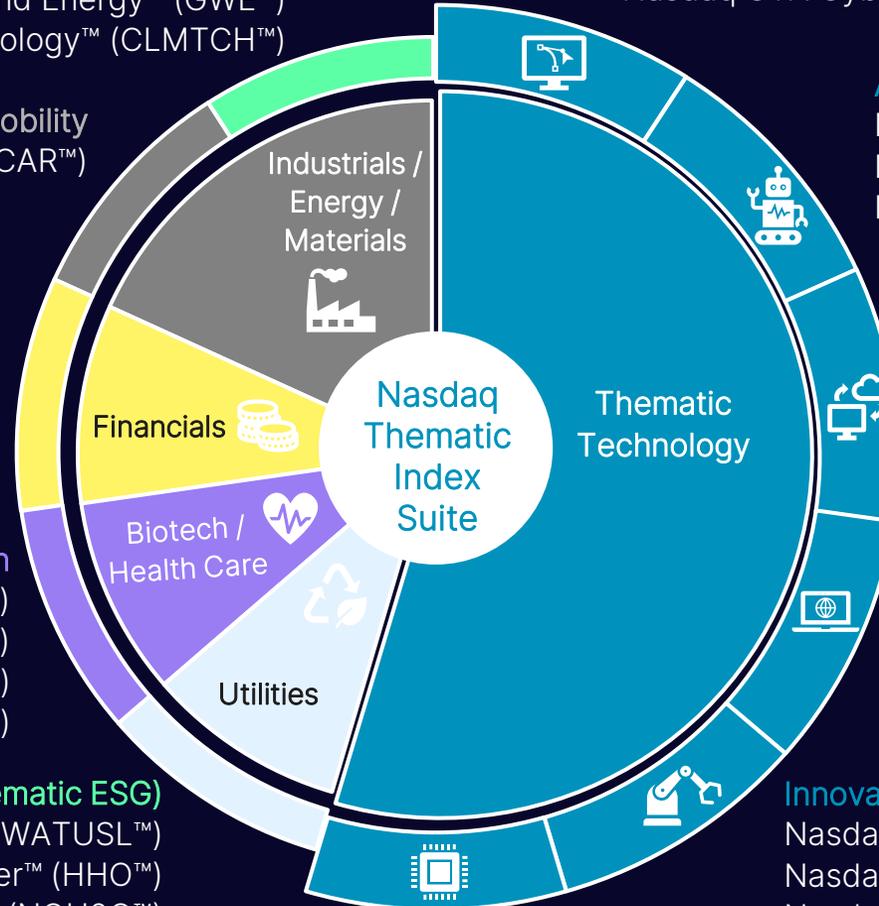
Semiconductors

- PHLX Semiconductor™ (SOX™)
- Nasdaq Global Semiconductor™ (GSOX™)
- PHLX Semiconductor Equal Weighted™ (ESOX™)

- Future Mobility**
- Nasdaq Global Future Mobility™ (NYGCAR™)
- FinTech**
- Nasdaq Crypto Index™ (NCI™)
- Nasdaq Blockchain Economy™ (RSBLCN™)
- KBW Nasdaq Financial Technology™ (KFTX™)
- Nasdaq CTA Global Digital Payments™ (WALLET™)
- ISE Mobile Payments™ (IPY™)
- Biotech / Health Care Innovation**
- Nasdaq Biotechnology™ (NBI™)
- Nasdaq Junior Biotech™ (NBIJR™)
- Nasdaq Lux Health Tech™ (NQHTEC™)
- Nasdaq CTA Global Digital Health™ (BEWELL™)

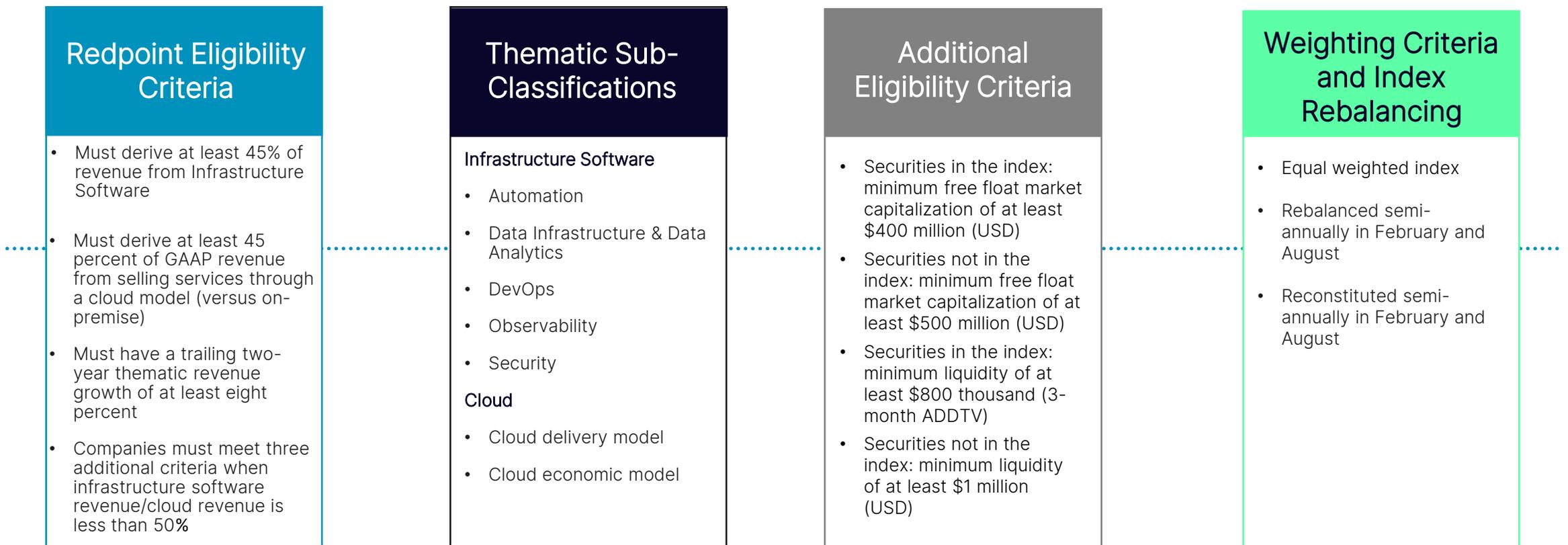
Resource Efficiency/Green Economy (Thematic ESG)

- Nasdaq Global/US Water™ (GRNWATERL™/GRNWATUSL™)
- ISE Clean Edge Water™ (HHO™)
- Nasdaq Veles California Water Index™ (NQH2O™)
- Nasdaq OMX Green Economy™ (QGREEN™)
- Nasdaq Clean Edge Global Green Income™ (GGINC™)



NQRPCI Index Methodology

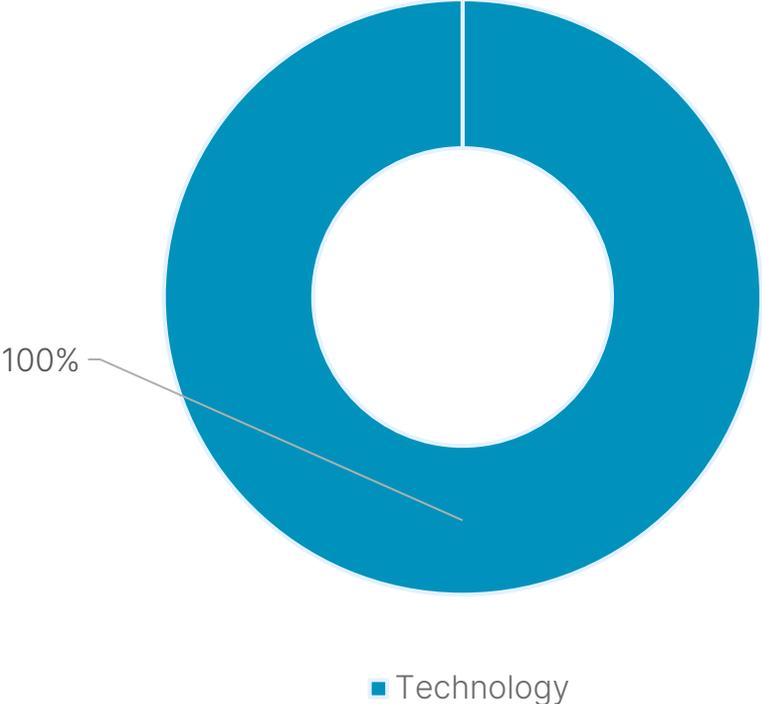
Redpoint determines index eligibility based on the involvement of companies engaged in the Cloud Infrastructure Software industry by establishing criteria for revenue share and revenue growth rates; additionally, Redpoint provides definitions for thematic classifications including infrastructure and cloud. NQRPCI was launched on April 24, 2023 and tracks 25 constituents.



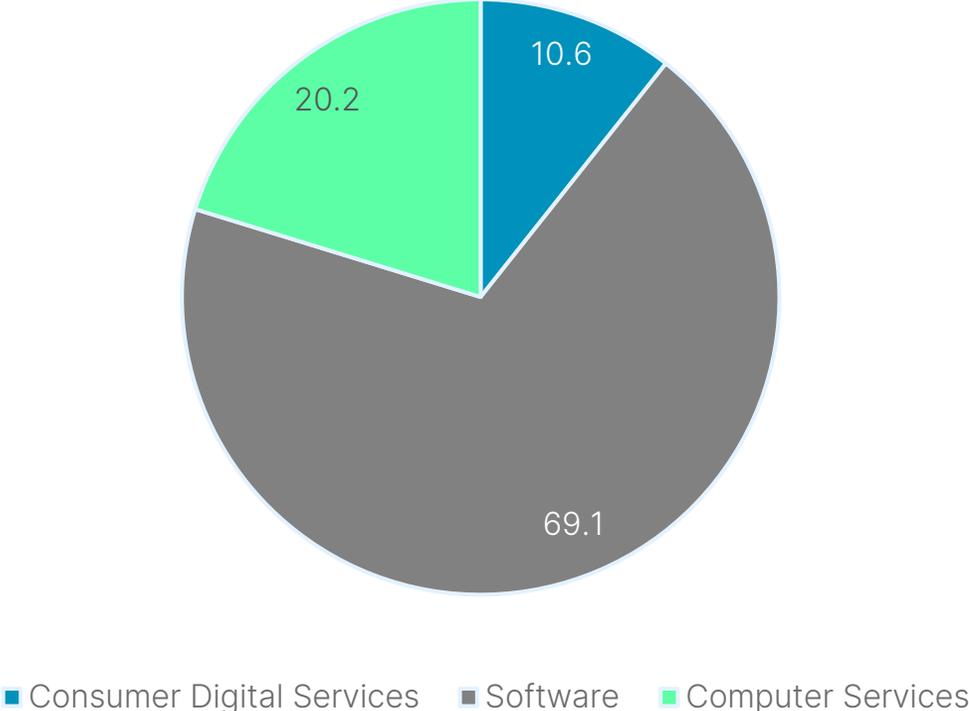
NQRPCI Industry and Sub-Sector Exposure

NQRPCI is a technology-heavy index made up of companies that are engaged in the Cloud Infrastructure Software Industry with distinct features and elements that underscore the growth of software markets

Index Weight (%) by ICB Industry



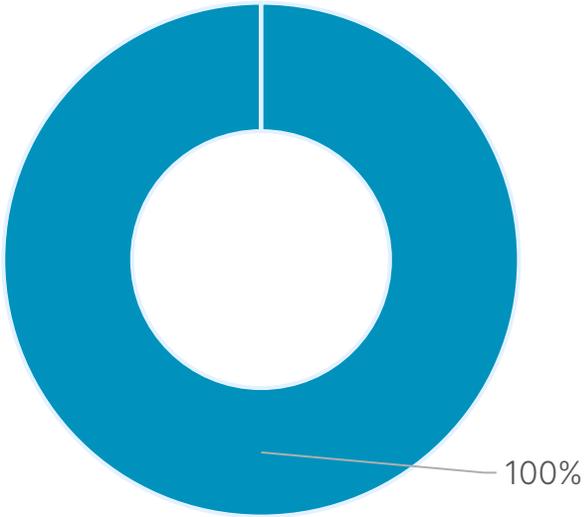
Index Weight (%) by ICB Sub-sector



NQRPCI Index Composition by Geography/Size

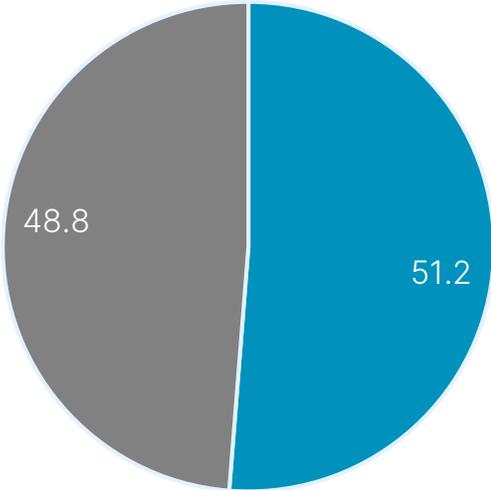
NQRPCI is a U.S. centric index with a robust ecosystem in place to support the growth of cloud-based software companies, and in particular, infrastructure software companies. About 51% of the index weight is tilted towards large-cap companies while mid-cap companies make up the rest of the index

Index Weight (%) by Country



■ United States

Index Weight (%) by Market-Cap



■ large-cap (>\$10 billion)

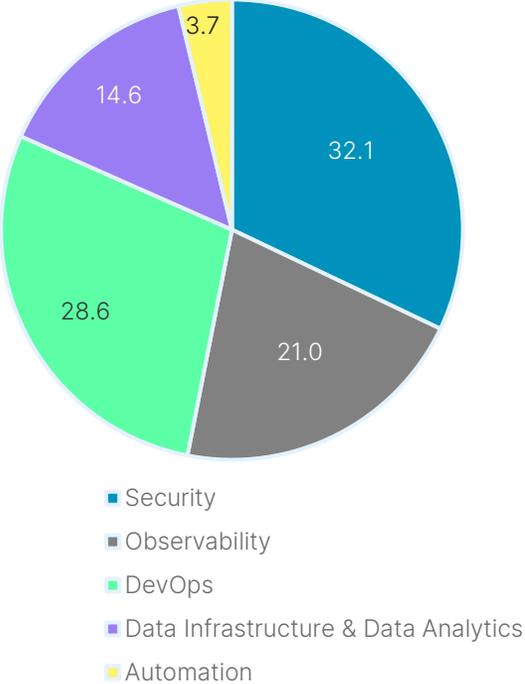
■ mid-cap (\$2-\$10 billion)



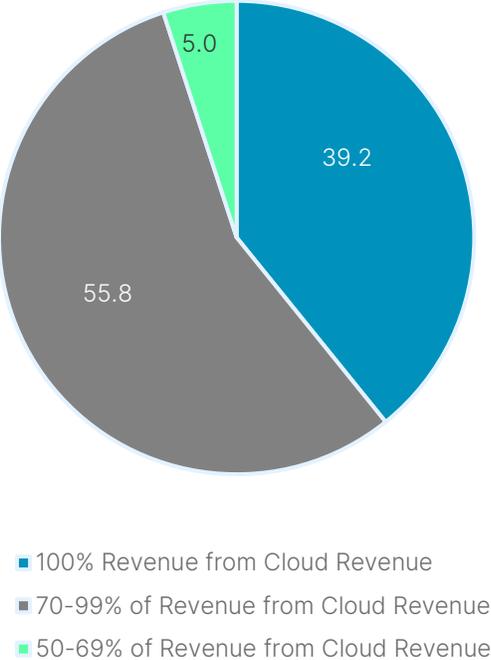
NQRPCI Composition by Redpoint Sector/Purity

In terms of revenue exposure, NQRPCI has a high degree of purity to the theme of cloud infrastructure SaaS which has seen tremendous value creation over the last decade; approximately 93% of index weight derives revenues from 100% pureplay cloud infrastructure companies

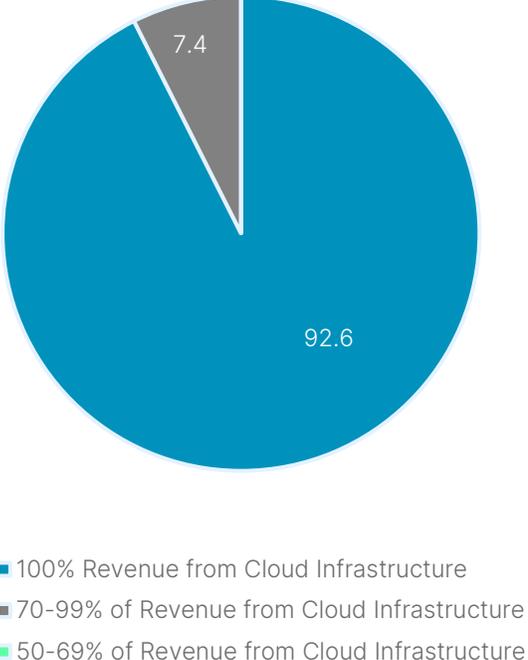
Index Weight (%) by Redpoint Sector



Index Weight (%) by Cloud Revenue Exposure



Index Weight (%) by Cloud Infrastructure Exposure

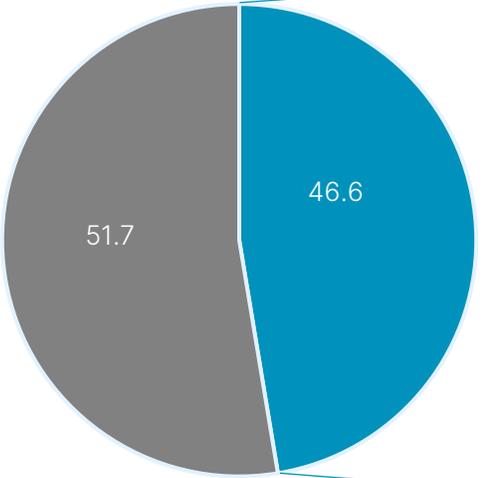


Source: Nasdaq Global Indexes, Factset data as of 7/31/2023

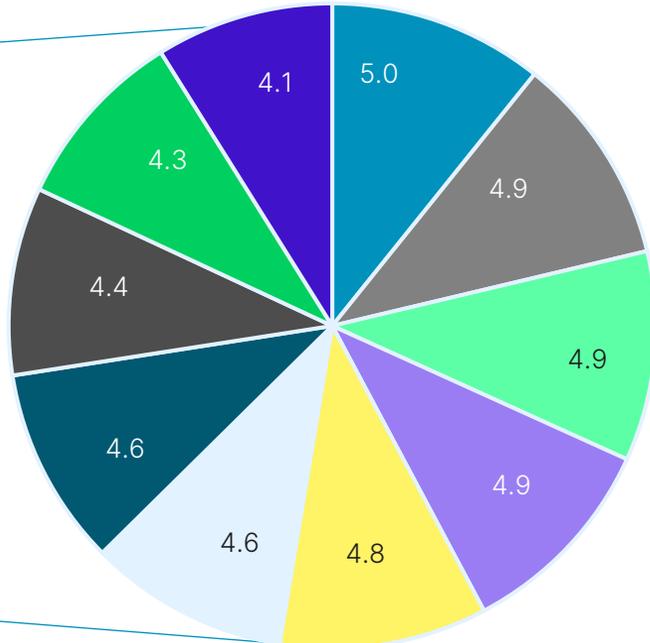
NQRPCI Index Composition: Top 10 Constituents

Around 47% of index weight is tied to companies that make up the top 10 of the index. The top 10 companies include Palo Alto Networks (network security solutions provider), CrowdStrike Holdings (cybersecurity solutions provider), Datadog (cloud-based monitoring and analytics platform) and Cloudflare (software solution provider). These 10 companies went public over the last decade with 7 of 10 companies going public over the last five years.

Index Weight (%): Top 10 vs. Rest of the Index



Top 10 Index Weights (%) as of July 31, 2023



- MongoDB
- DigitalOcean
- Palo Alto Networks
- Datadog
- CrowdStrike Holdings
- Confluent
- Dynatrace
- New Relic
- Cloudflare
- Zscaler

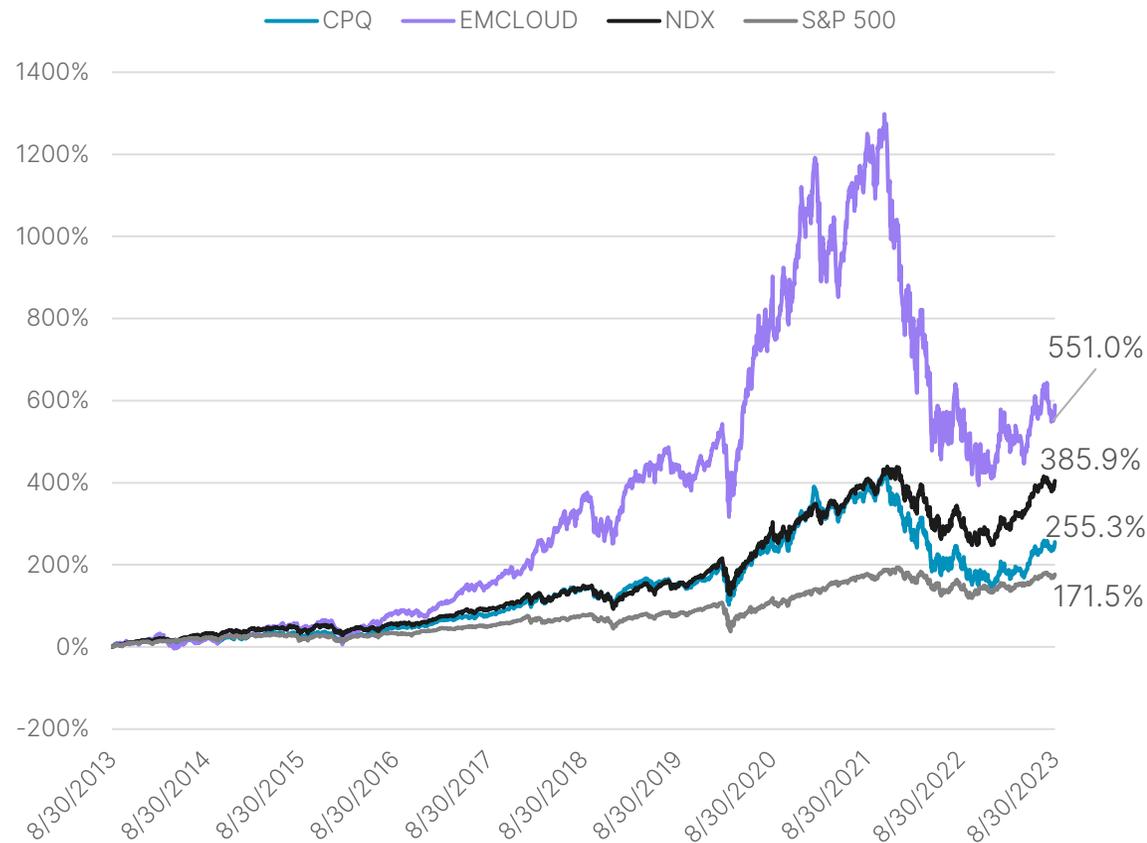


Source: Nasdaq Global Indexes, Factset data as of 7/31/2023

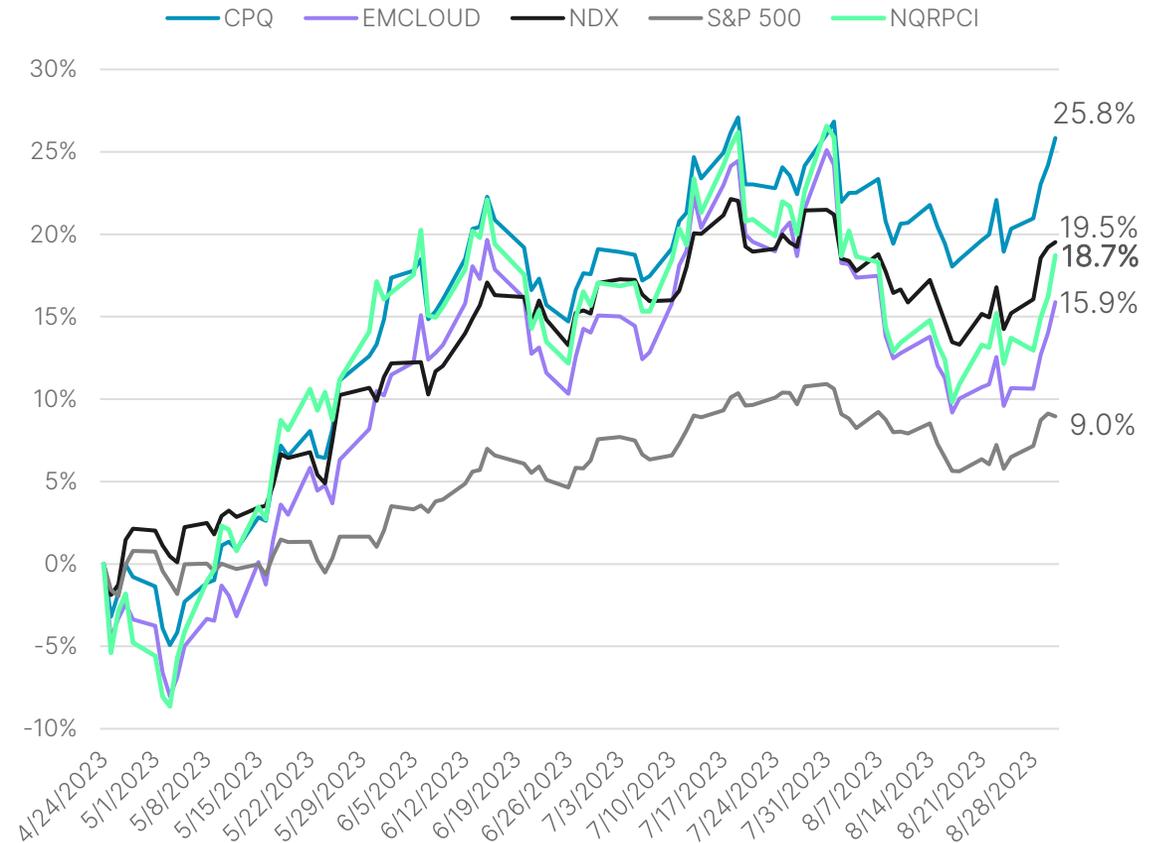
Nasdaq Cloud Index Performance vs. Benchmarks

CPQ and EMCLOUD have generated strong returns since August 2013, the earliest date of history for both indexes, outperforming the S&P 500 by a substantial margin. This year, they continue to outperform the S&P 500 while closely tracking NDX. Since NQRPCI was launched on April 24, 2023, it has gained 18.7% on a price-return basis, more than double the S&P 500.

10-Year Price Performance as of August 31, 2023 (%)



Price Performance Since Launch of NQRPCI (%)



Source: Nasdaq Global Indexes, Bloomberg data as of 8/31/2023

Competitor Products in Thematic Cloud

NQRPCI has a high degree of product differentiation. On average, NQRPCI constituents represent only 17%-29% of weight of competitor products. Product differentiation extends to the index methodology and how cloud is defined by competitors, as indicated below

ISE Cloud Computing Index (Ticker: CPQ)

- 86.9% of index weight allocated to Technology (ICB Industry)
- Currently tracks 64 constituents, modified theme strength-weighted index with 4.5% capping and is reconstituted quarterly.
- Top 5 largest constituents:
 - Pure Storage, MongoDB, IBM, Amazon, Oracle
- Minimum constituent weighting: 0.42%
- 15 constituents in common with NQRPCI, representing 23.7% of CPQ's weight
- Overlapping constituents represent 63.5% of NQRPCI's weight
- Average market cap: \$122.7 billion
- CTA classifies a security as a Cloud Computing company and into the following buckets: (a) Infrastructure-as-a-Service (IaaS) (b) Platform-as-a-Service (PaaS) and (c) Software-as-a-Service (SaaS)
- CTA classifies companies based on how infrastructure software is defined (e.g., servers, storage, virtualization) rather than where software is hosted or how it is accessed or consumed

BVP Nasdaq Emerging Cloud Index (Ticker: EMCLOUD)

- 87.5% of index weight allocated to Technology (ICB Industry)
- Currently tracks 67 constituents, equal-weighted index with 4.5% capping and is rebalanced and reconstituted semi-annually.
- Top 5 largest constituents:
 - MongoDB, C3.ai, Asana, Shopify, Adobe, Braze
- Smallest constituent weighting: 0.65%
- 19 constituents in common with NQRPCI, representing 29.3% of EMCLOUD's weight
- Overlapping constituents represent 77.1% of NQRPCI's weight
- Average market cap: \$19.1 billion
- BVP defines a security as a Cloud Computing company if it derives revenue from software products which are both provided to customers through (a) a cloud delivery model (b) a cloud economic model
- BVP classifies companies based on how software is hosted (e.g., remote and multi-tenant server infrastructure) and how customers access the offerings (e.g. subscription based, volume-based) rather than the type of infrastructure

Indxx Global Cloud Computing Index (Ticker: ICLOU)

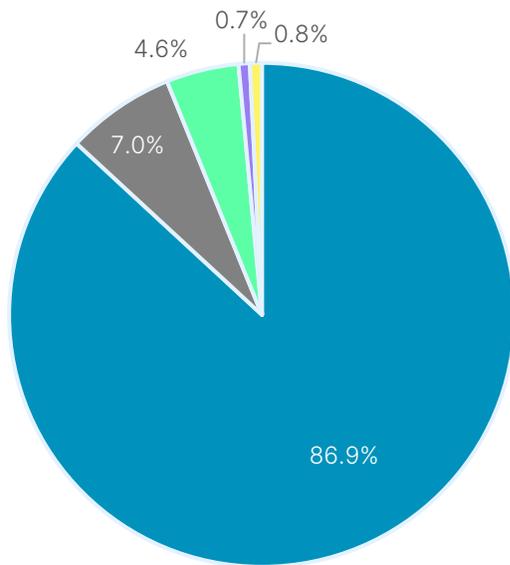
- 87.2% of index weight allocated to Technology (ICB Industry)
- Currently tracks 36 constituents, security-level market-cap weighted index with 4.0% capping for cloud computing companies and 2% capping for public cloud companies and is rebalanced and reconstituted semi-annually.
- Top 5 largest constituents:
 - Zscaler, Freshworks, Dropbox, Qualys, Akamai Technologies
 - Smallest constituent weighting: 0.3%
- 4 constituents in common with NQRPCI, representing 17.1% of ICLOU's weight
- Overlapping constituents represent 16.3% of NQRPCI's weight
- Average market cap: \$178.2 billion
- Indxx is more granular when it classifies cloud computing companies. It classifies them into (a) Software as a Service (SaaS), (b) Platform as a Service (PaaS), (c) Infrastructure as a Service (IaaS) (d) Data Center REITs (e) Cloud and Edge Computing, Infrastructure/Cloud and Infrastructure Components



Competitor Products in Cloud Computing

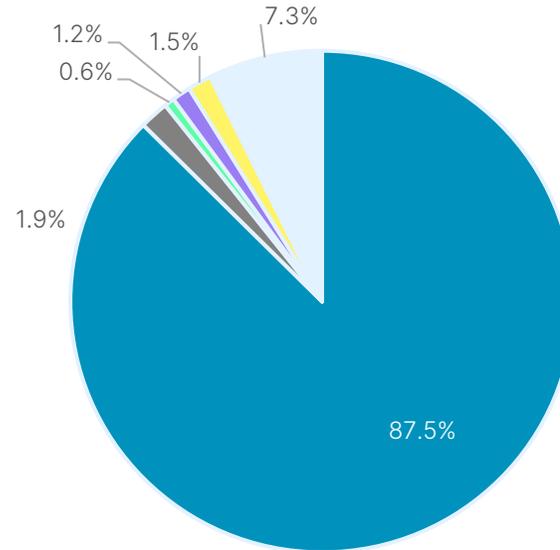
Compared to competitor products in the Cloud Infrastructure space which have exposure to other industries including Consumer Discretionary, Industrials, Telecommunications and Healthcare, NQRPCI provides 100% concentrated exposure to Technology

ISE Cloud Computing Index
(Ticker: CPQ)



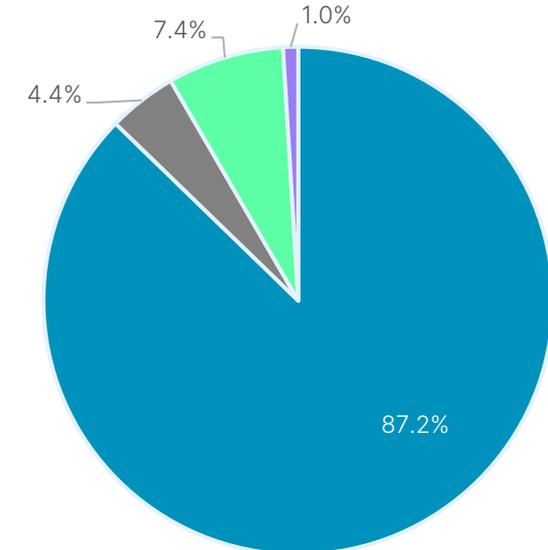
- Technology
- Telecommunications
- Consumer Discretionary
- Health Care
- Industrials

BVP Nasdaq Emerging Cloud Index
(Ticker: EMCLOUD)



- Technology
- Telecommunications
- Consumer Discretionary
- Financials
- Health Care
- Industrials

Indxx Global Cloud Computing Index
(Ticker: ICLOU)



- Technology
- Real Estate
- Consumer Discretionary
- Health Care



Source: Nasdaq Global Indexes, Bloomberg data as of 7/31/2023.

The industry weights of Global X Cloud Computing ETF (CLOU) which tracks the index ICLOU are used to represent the industry weights of the ICLOU index

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