

JULY 2023

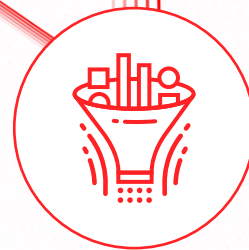
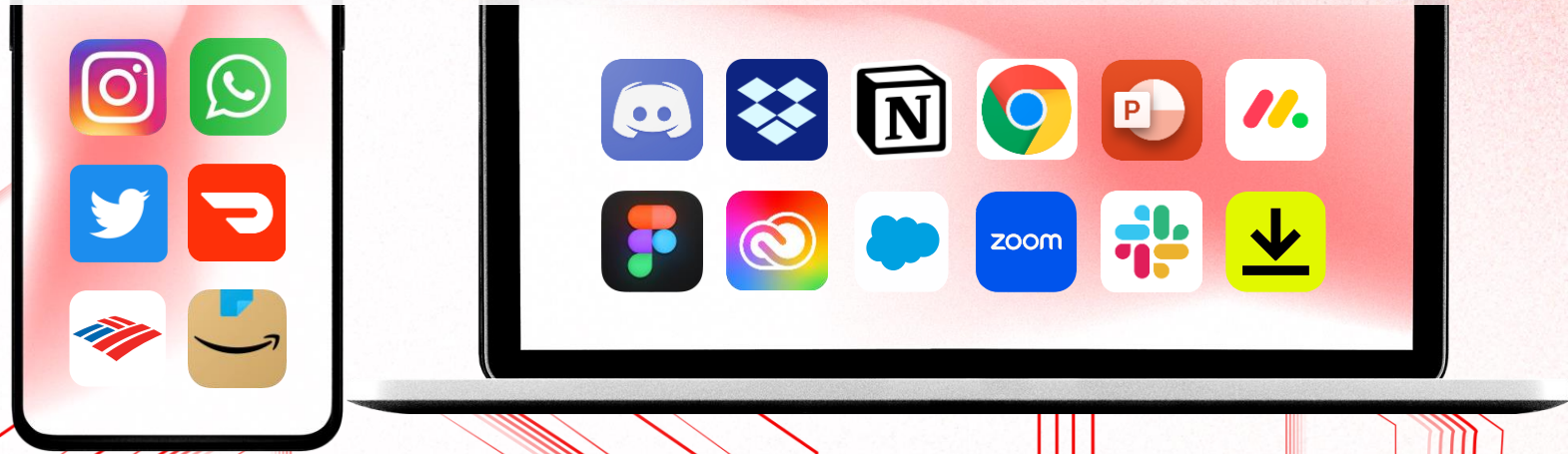
THE INFRARED **REPORT**
The State of Cloud Infrastructure



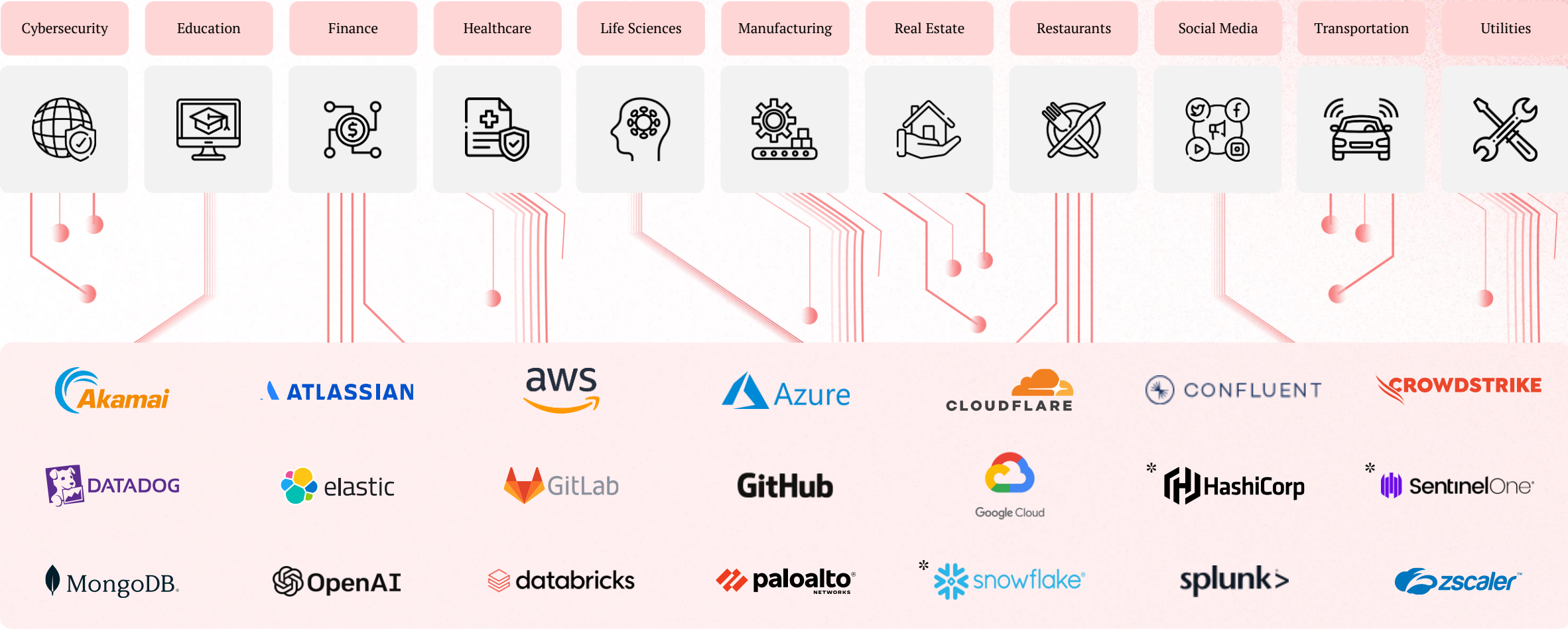
We interact with dozens of apps



These apps are supported by a layer of invisible technology

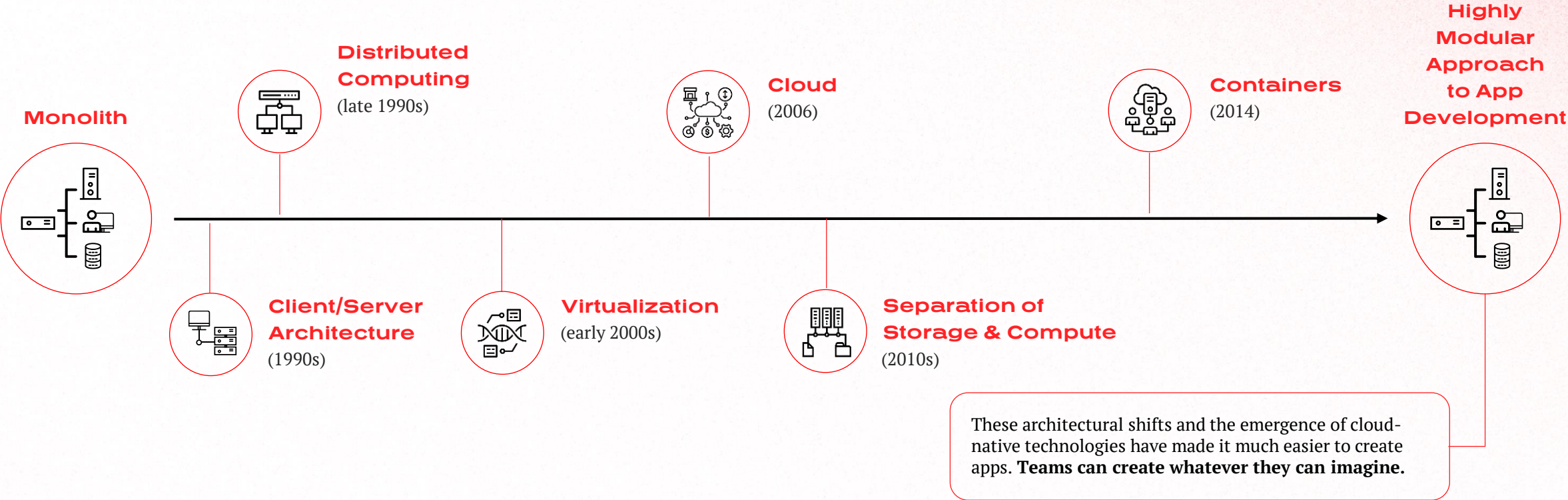


This layer is infrastructure software, and it powers virtually everything



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 & AI

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.



DevOps & Developer Tools

1

Heroku 2.0: an emergence of simpler primitives and platforms to more easily use the major cloud providers.

Managed Deployment



 Railway  render

 Fly.io  zeet

2

Building resilient distributed applications is complex. A wave of tools have emerged to curb this complexity.

Distributed Apps

 Temporal 

 orkes

3

Observability now has four pillars: logs, metrics, traces, and cost.

Four Pillars of Observability



Logs



Metrics



Traces

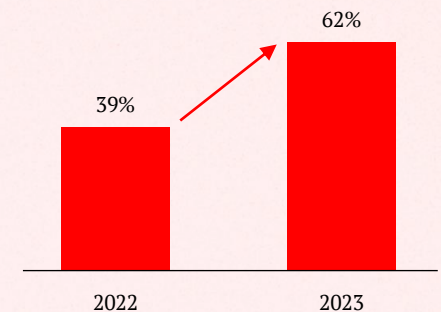


Cost

4

Convergence of ML has played a critical role in the SDLC, from powering source code generation to optimizing runs and builds.

% of Developers who use AI/ML to check code



Cybersecurity

1

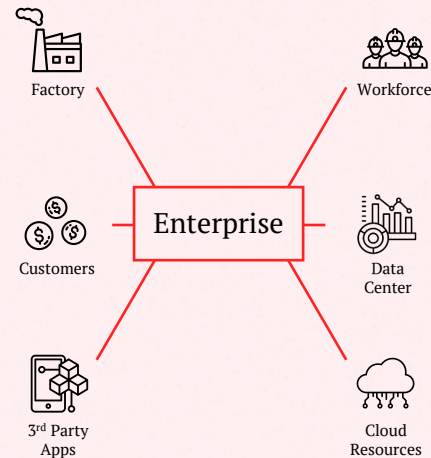
Increased cloud adoption creates gaps within security coverage. A wave of startups to address various parts of cloud security have emerged.

Cloud Security



2

Distributed work made the corporate network irrelevant. Instead, understanding identity and access of users and devices is crucial.



3

Understanding vulnerabilities in code design will only gain in importance as developers increasingly rely on solutions like Github Copilot.

Code and Application Security



4

Data security will be crucial to secure AI models from attacks like data poisoning. DLP will need to be enhanced when sending sensitive information to AI models.

30%

of all AI cyberattacks will leverage training data poisoning to attack AI-powered systems



Data & AI

1

A truly open ecosystem has developed around cloud data, with a level of interoperability that didn't exist in past decades.

Modern Cloud Data Stack



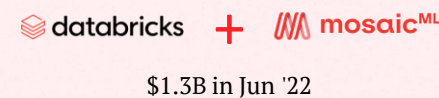
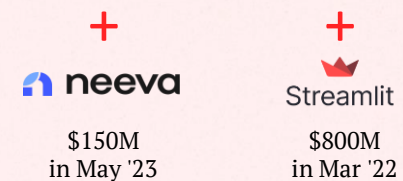
2

A framework has recently emerged that avoids vendor lock-in with data warehouses. This architecture consists of open-source data formats and specialized query engines.



3

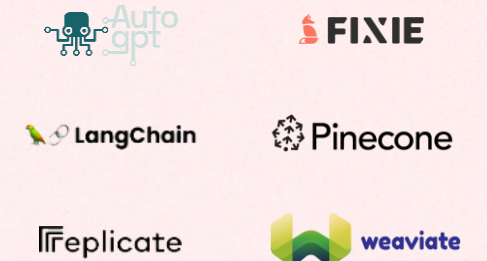
Snowflake and Databricks are on a collision course to tackle the AI wave as they attempt to unify proprietary enterprise data in their data stores with intelligent applications.



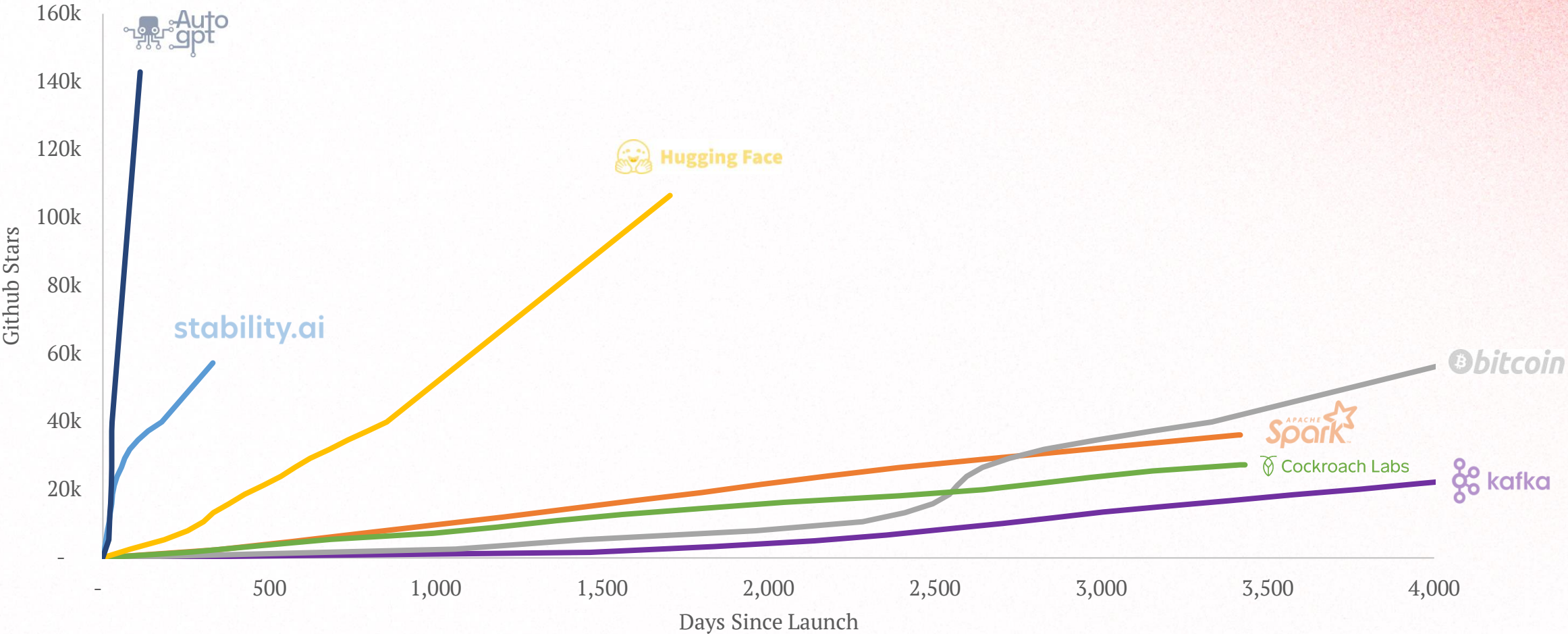
4

Foundation models are akin to AWS servers which power AI use cases. A wave of AI infrastructure has quickly emerged to support AI use cases around data retrieval, integration, and augmentation.

ML Infrastructure



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



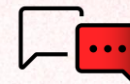
Introduced a shopping assistant powered by GPT



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

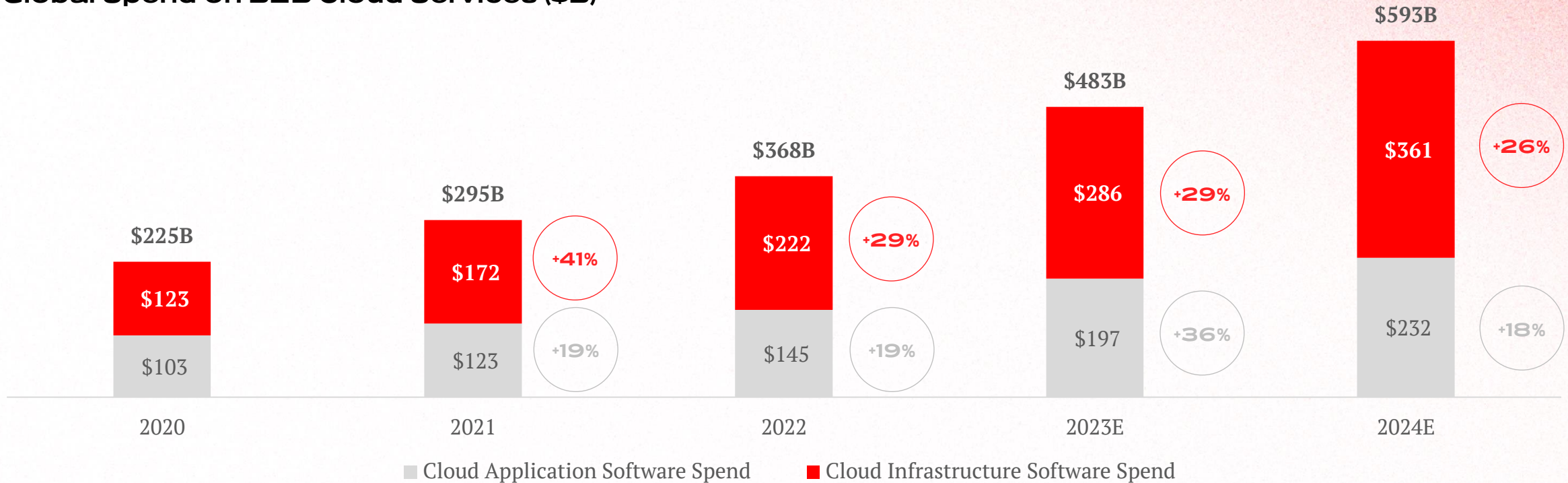


Cloud Infrastructure by the Numbers



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

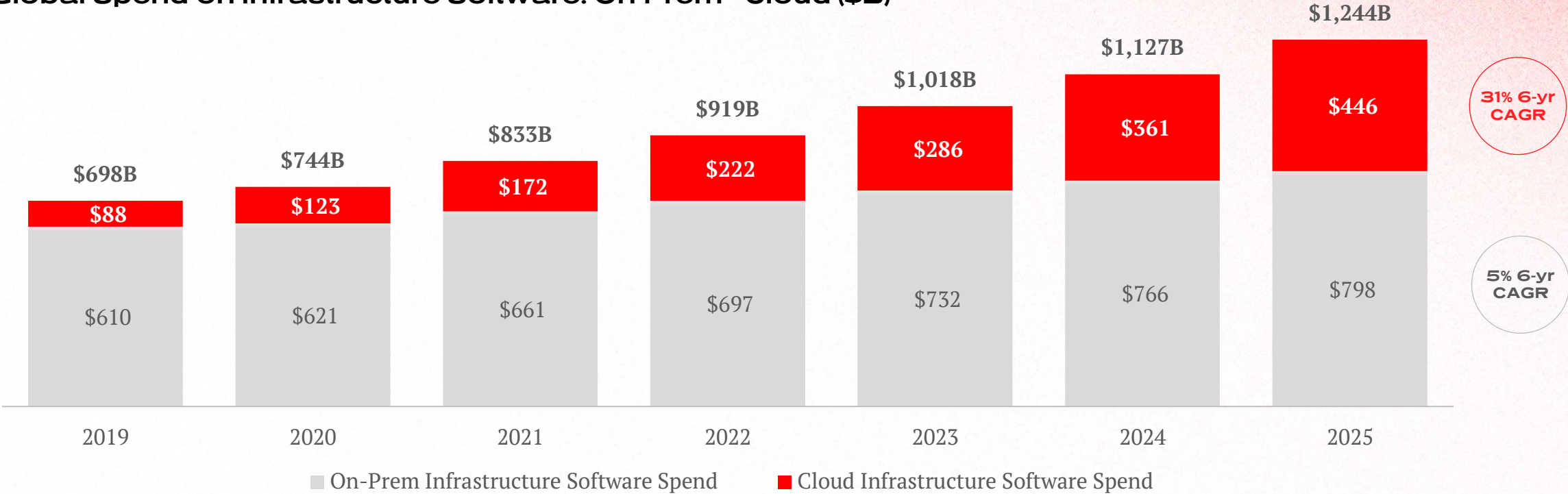
Global Spend on B2B Cloud Services (\$B)



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)



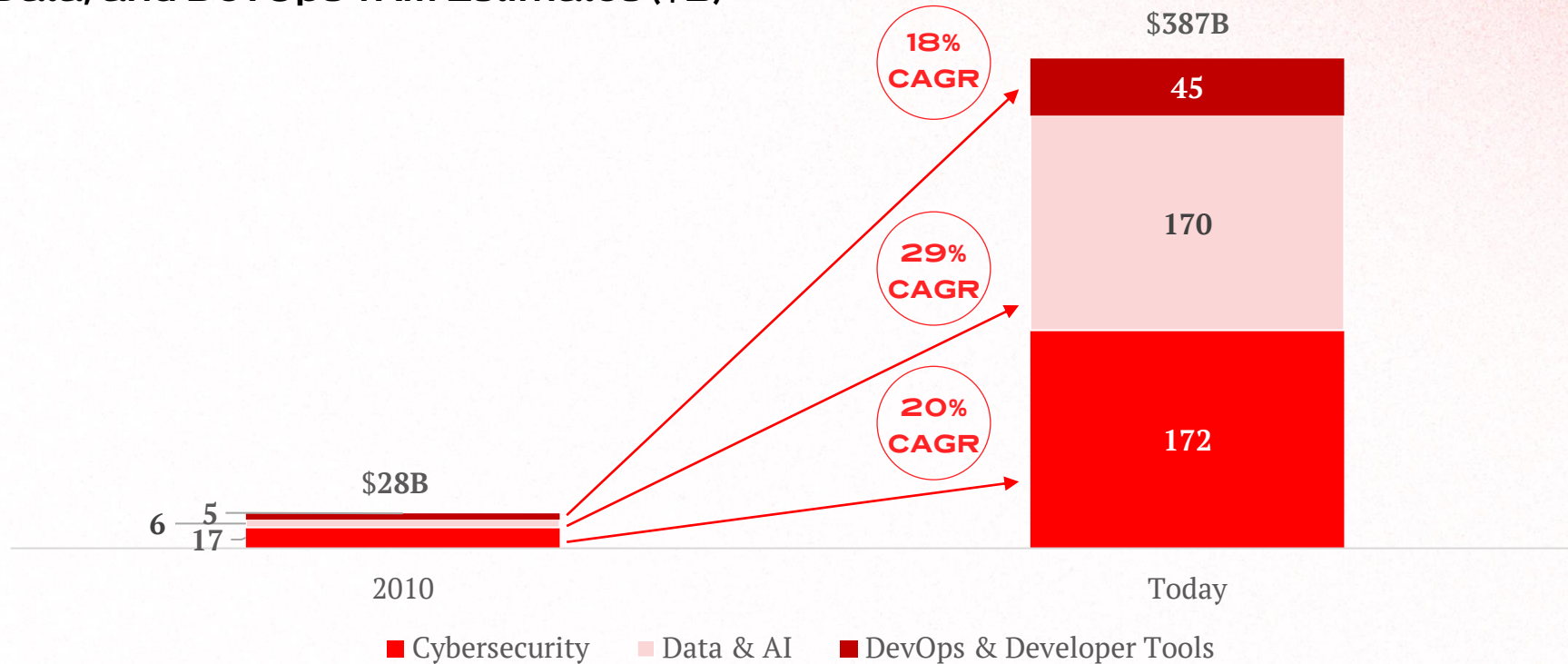
Amidst the growth of the broader infrastructure market, spend on cloud-based infrastructure has exploded. There remains a significant amount of legacy, on-prem spend that will be unlocked with the cloud.



Note: On-prem infrastructure software spend is spend on infrastructure solutions that are hosted on-site. Cloud infrastructure software spend is spend on infrastructure solutions accessed over the Internet.

Each category within cloud infrastructure is getting bigger

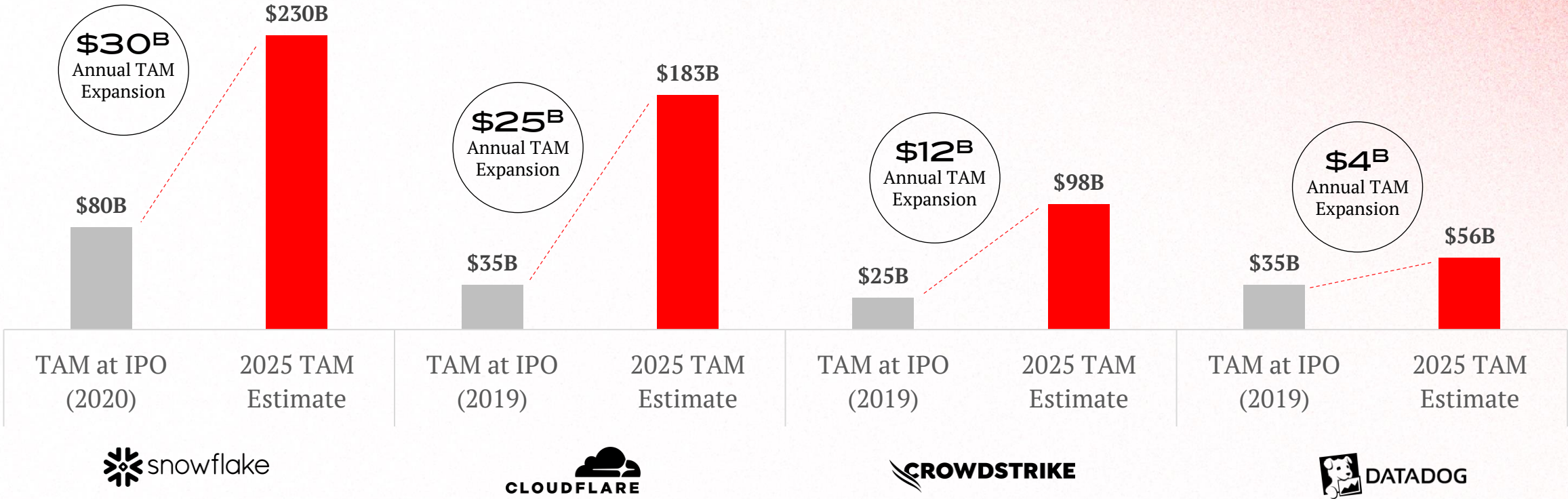
Cybersecurity, Data, and DevOps TAM Estimates (\$B)



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.



Source: Company Filings & Investor Presentations
 Note: Snowflake IPO Date: 9/16/2020, Cloudflare IPO Date: 9/13/2019, CrowdStrike IPO Date: 6/12/2019, Datadog IPO Date: 9/19/2019

The power of usage-based pricing

Seat-Based Pricing

Usage-Based Pricing



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

↓

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.

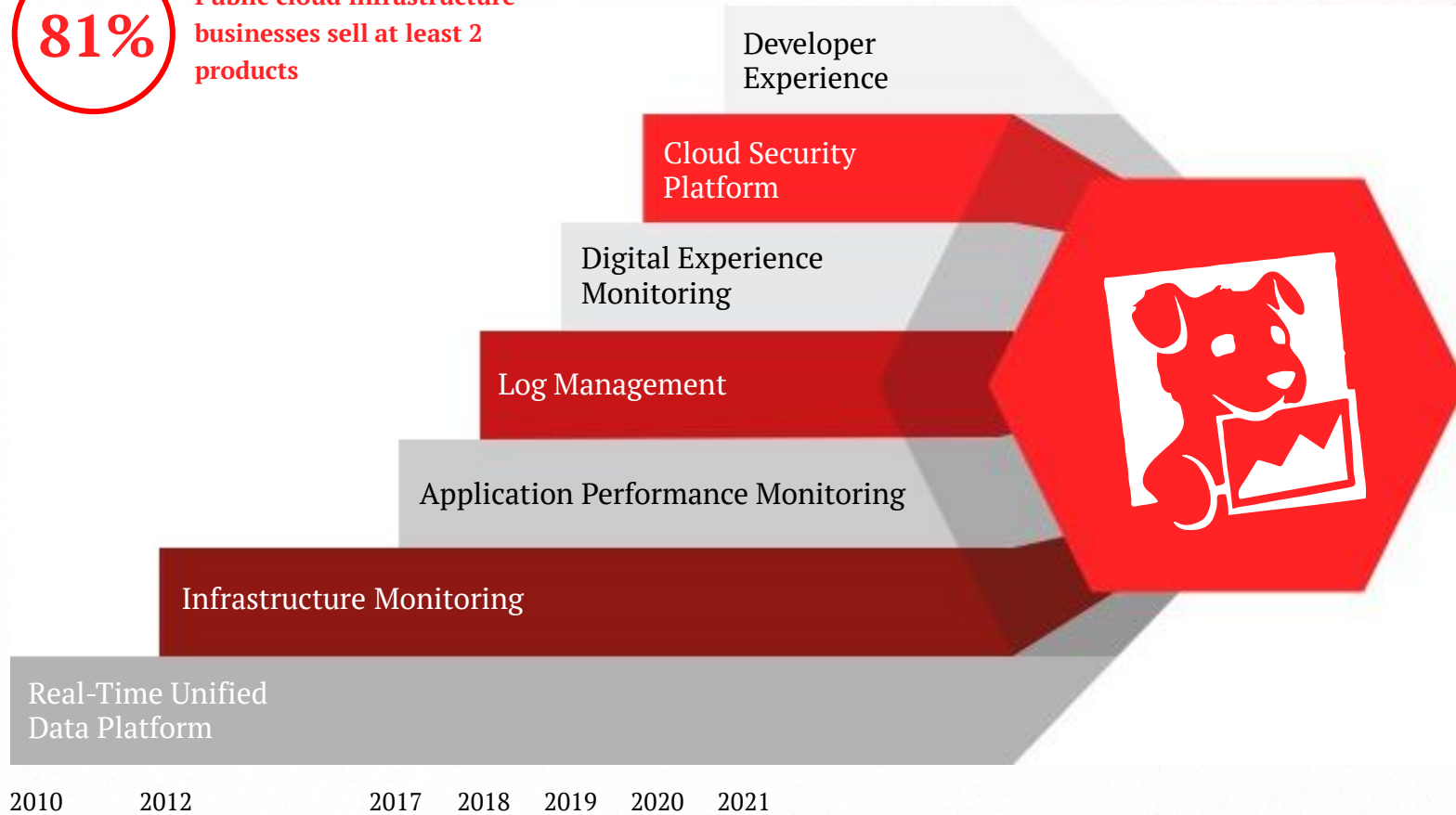
Note: Data from company filings available as of July 14th, 2023. NDR defined as (Starting MRR + Expansion MRR - Contracted/Churned MRR) / Starting MRR x 100. Infrastructure SaaS cohort: AKAM, TEAM, NET, CFLT, CRWD, DDOG, DOCN, DT, ESTC, GTLB, HCP, JAMF, FROG, MDB, NEWR, OKTA, PD, PANW, S, SNOW, SPLK, 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



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.

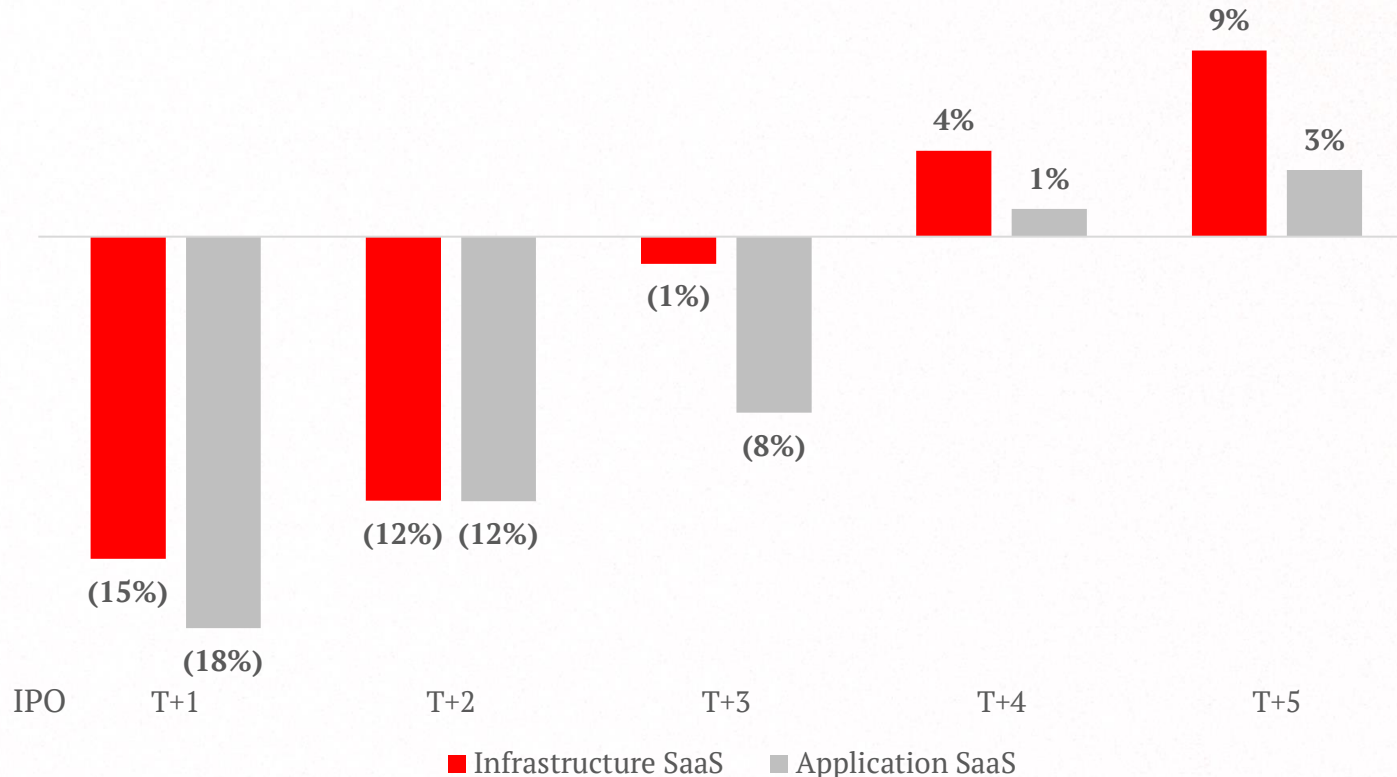


Over 80% of infrastructure software businesses sell at least two different products. **This allows infrastructure businesses to generate incremental revenue easier and faster.**



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:



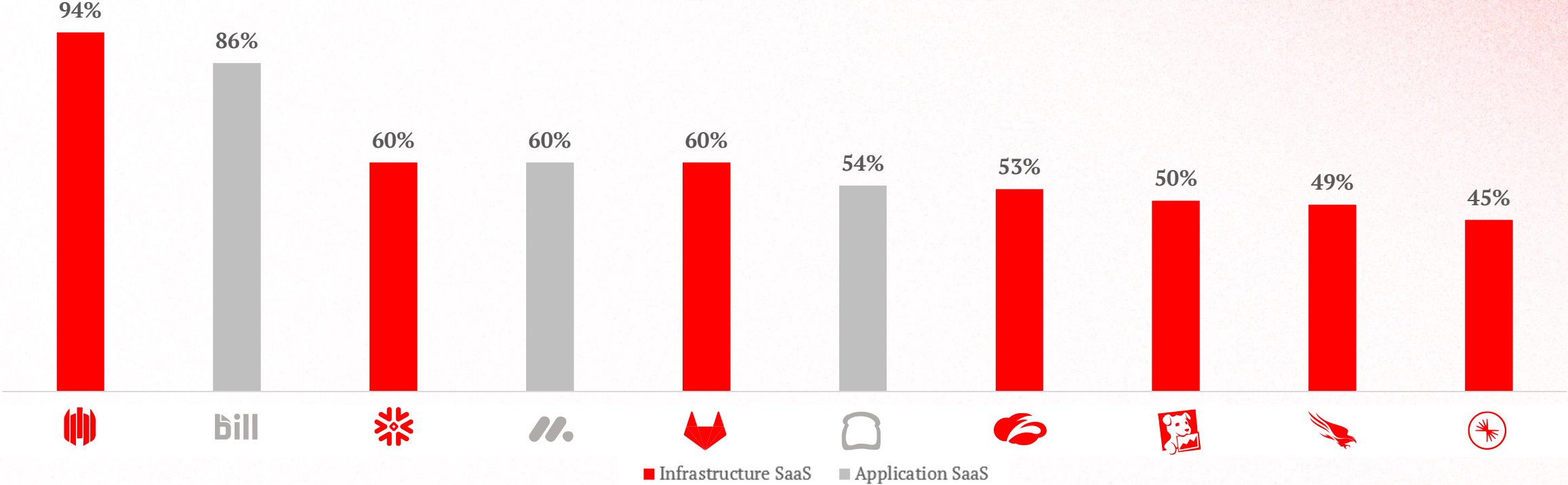
- On average, infrastructure vendors sell into larger markets
- Customers spend more on infrastructure. Average ACVs are higher relative to that of application SaaS
- Some infrastructure businesses are open-source and can successfully harvest their bottoms-up base with minimal to no CAC

Note: Data from company filings available as of July 14th, 2023. FCF Margin is defined as cash generated by a firm in proportion to the revenue after the firm has met its financial obligations. 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



These dynamics create larger and faster-growing businesses

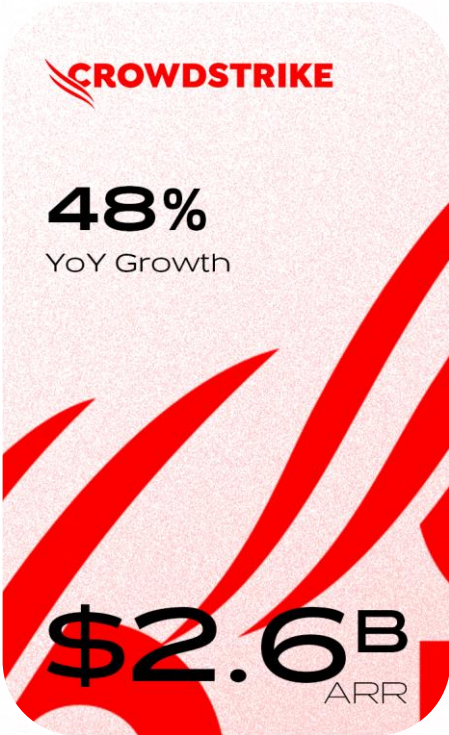
Public Enterprise Software Businesses with >\$500M ARR; ranked by LTM Growth Rate



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.

Note: Data from company filings available as of July 14th, 2023. Only includes companies with implied ARR of >\$500M. LTM Growth rate defined as revenue growth over the last twelve months. Source: Company Filings

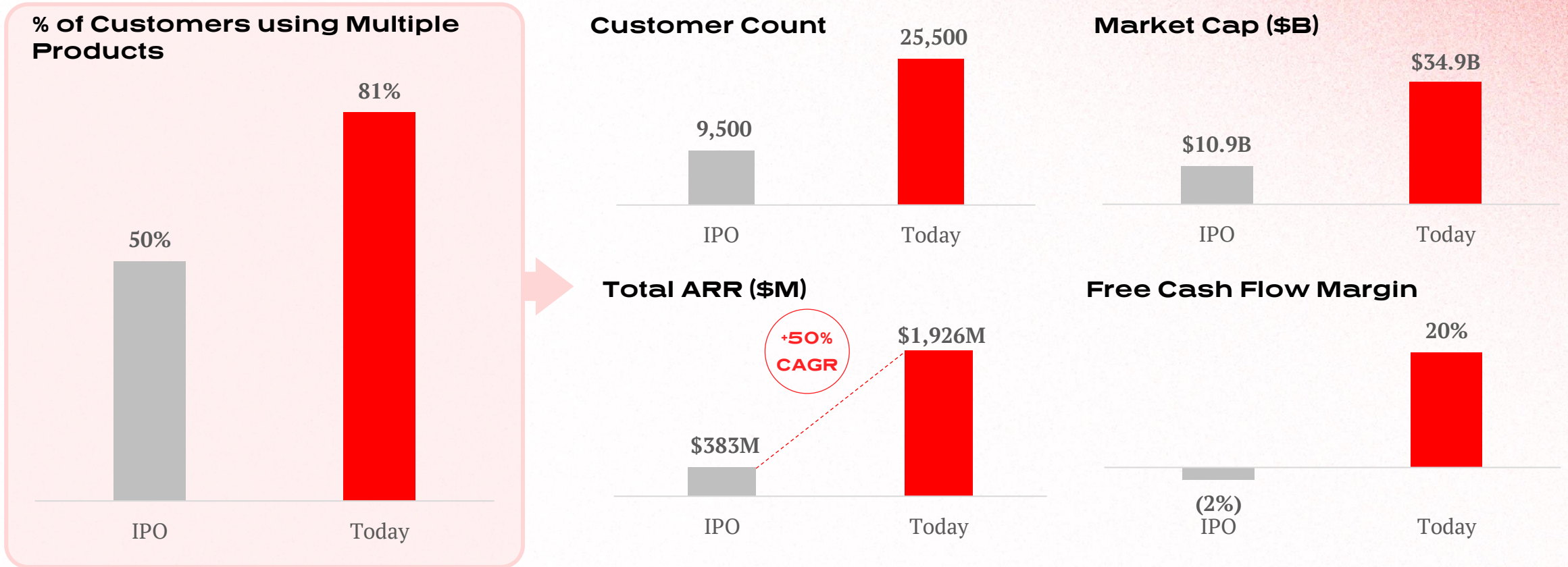
The likes of which we haven't seen



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

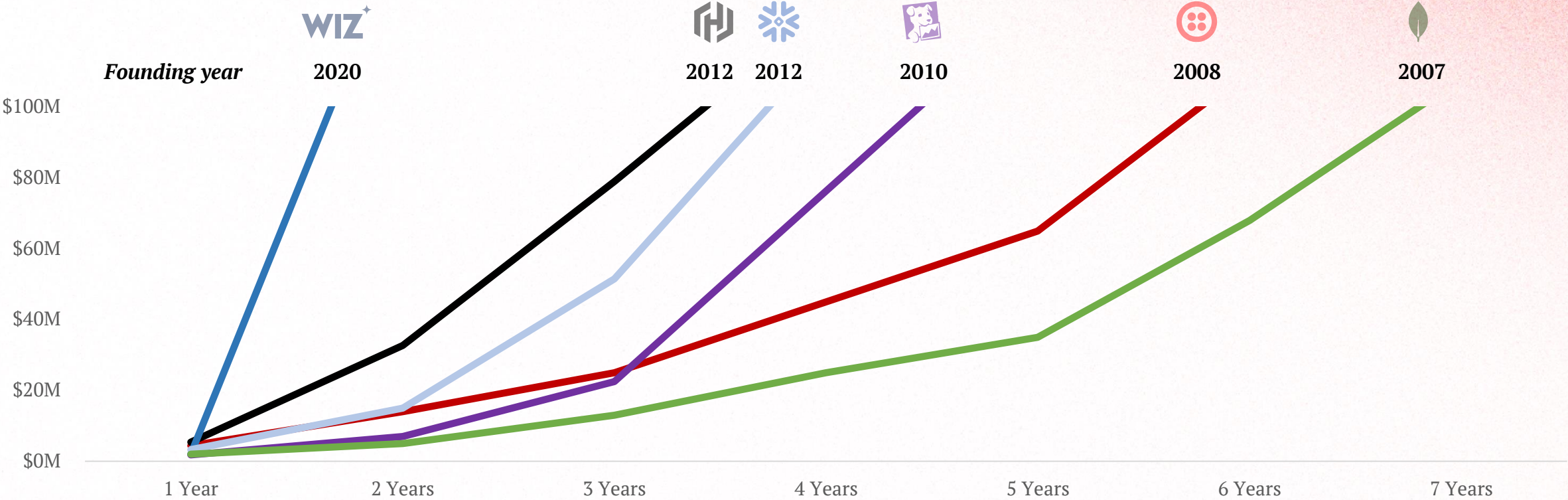


Since its IPO, Datadog has significantly increased its share of multi-product customers and more than doubled its customer base. This has supercharged revenue growth and profitability, creating billions of equity value.

Note: Datadog IPO Date: September 19th, 2019. Data from company filings available as of July 14th, 2023. Multi-Product Customer Share is defined as the percentage of customers that use more than one product. Free Cash Flow Margin is defined as cash generated by a firm in proportion to the revenue after the firm has met its financial obligations.



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

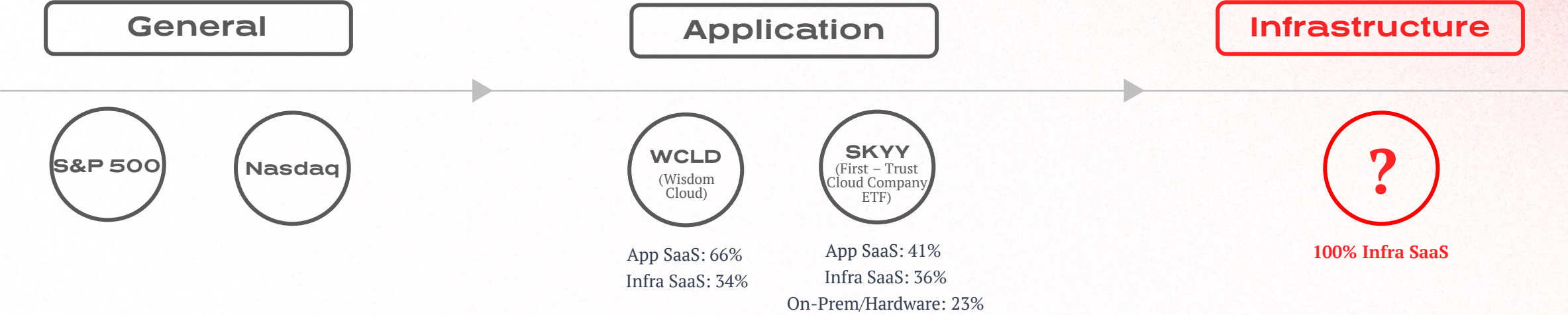
	Application SaaS	Infrastructure SaaS		Application SaaS	Infrastructure SaaS
Market Cap (\$B)	\$4.5B	\$11.9B	FCF Margin	5%	9%
NTM Revenue Growth	16%	20%	Rule of 40	32%	44%
NDR	113%	120%	Multiple Return Since IPO	1.4x	2.9x

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, QFTWO, 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.



Note: Application, Infrastructure, and On-Premise/Hardware composition refers to the market-cap weighted split of companies within each index as of July 14th, 2023. Source: SKYY and WCLD Holdings List

**Introducing The Nasdaq
Redpoint Cloud Infrastructure
Software Index™**



25 companies across 3 verticals



DevOps & Developer Tools

Cybersecurity

Data & AI

ATLASSIAN DATADOG Digital Ocean

dynatrace GitLab * HashiCorp

jamf JFrog New Relic

PagerDuty splunk > * twilio

Akamai CLOUDFLARE

CROWDSTRIKE okta

paloalto * SentinelOne

tenable zscaler

CONFLUENT elastic

MongoDB * snowflake

UiPath™



Note: The makeup of the Nasdaq Redpoint Cloud Infrastructure Software Index (NQRPCI) is determined by NASDAQ in partnership with the Company following publicly disclosed methodology, available at https://indexes.nasdaqomx.com/docs/Methodology_NQRPCI.pdf. The Nasdaq Redpoint Cloud Infrastructure Software Index (NQRPCI) is administered by Nasdaq, Inc., with the Company as an index contributor. For more information, please see <https://indexes.nasdaqomx.com/Index/Overview/NQRPCI>. Asterisk denotes Redpoint portfolio company.

Overview of The Nasdaq Redpoint Cloud Infrastructure Software Index™

25

Businesses across
Cloud Infrastructure

2019

Median
IPO Date

\$460B+

Aggregate
Market Cap

~\$12B

Median
Market Cap

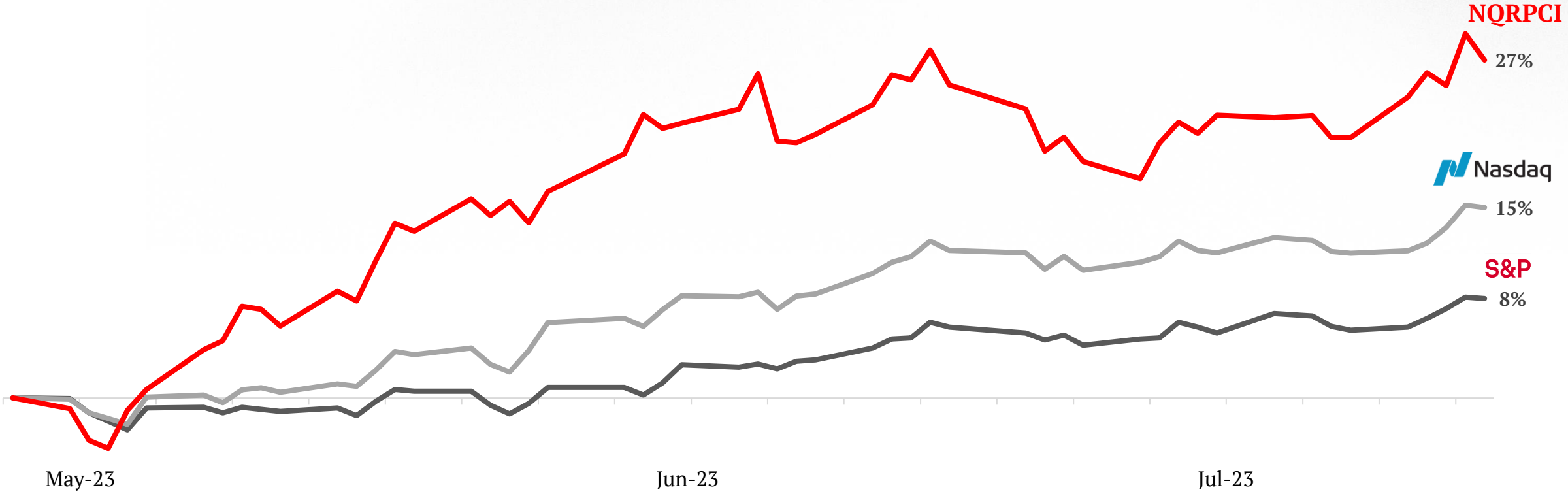
20%

Median NTM
Growth Rate



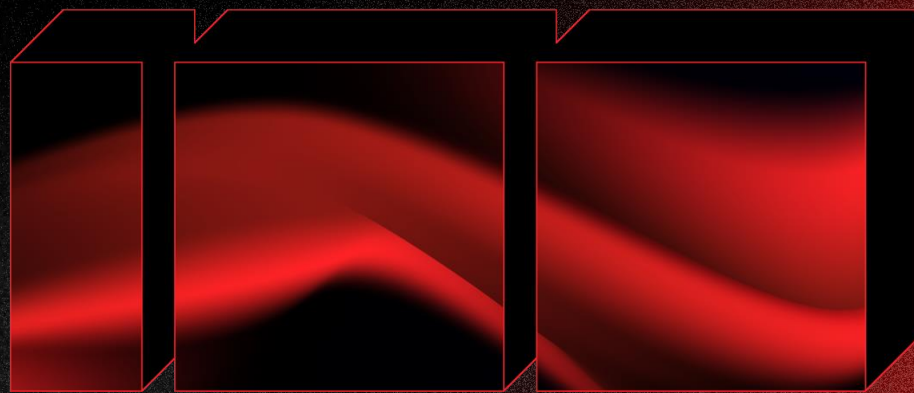
Off to a strong start

% Return Since the Launch of NQRPCI



Source: S&P 500 Index, Nasdaq Composite Index, Nasdaq Redpoint Cloud Infrastructure Software Index (NQRPCI)
Note: Data as of July 14th, 2023. S&P and Nasdaq are market weighted indices while NQRPCI is an equal weighted index.

INFRA
RED



The Next Up-and-Coming Infrastructure Software Businesses



ABOUT THE INFRARED 100



Aggregate
Valuation



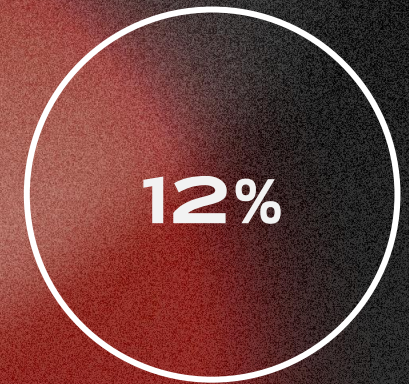
Total Dollars
Raised



Average Annual
Revenue Growth
Rate



Unicorns



% International

The InfraRed 100 represents 100 of the fastest-growing private cloud infrastructure software businesses.

EARLY STAGE



BuildBuddy

Chainguard

chromatic

ConductorOne

* **Dagger**

Deno

DOPPLER

* **Dragonfly**

* **HumanSignal**

incident.io

kubecost

LangChain

Linear

* **LiveKit**

Lumos

METRONOME

Modal

* **MotherDuck**

NEON

* **omni**



projectdiscovery.io

* **Railway**

Replicate

runZERO

Tabular

Early-stage is comprised of Seed and Series A infrastructure software startups.

MID STAGE

airplane

AppOmni

AssemblyAI

atlan

cortex

* cyberhaven

* cyera

descope

Fly.io

glean

* HEX

hightouch

Hugging Face

ISOVALENT

JELLYFISH

* Materialize

MINIO

Pinecone

PlanetScale

Pulumi

Redpanda

REPLICATED

Retool

* Semgrep

* solo.io

star+tree

supabase

synthesia

tackle.io

tailscale

* Timescale




















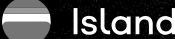
















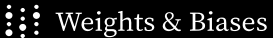


tines

Weaviate

zesty

Mid-stage includes startups that have raised at least a Series B with less than \$200M in total funding.

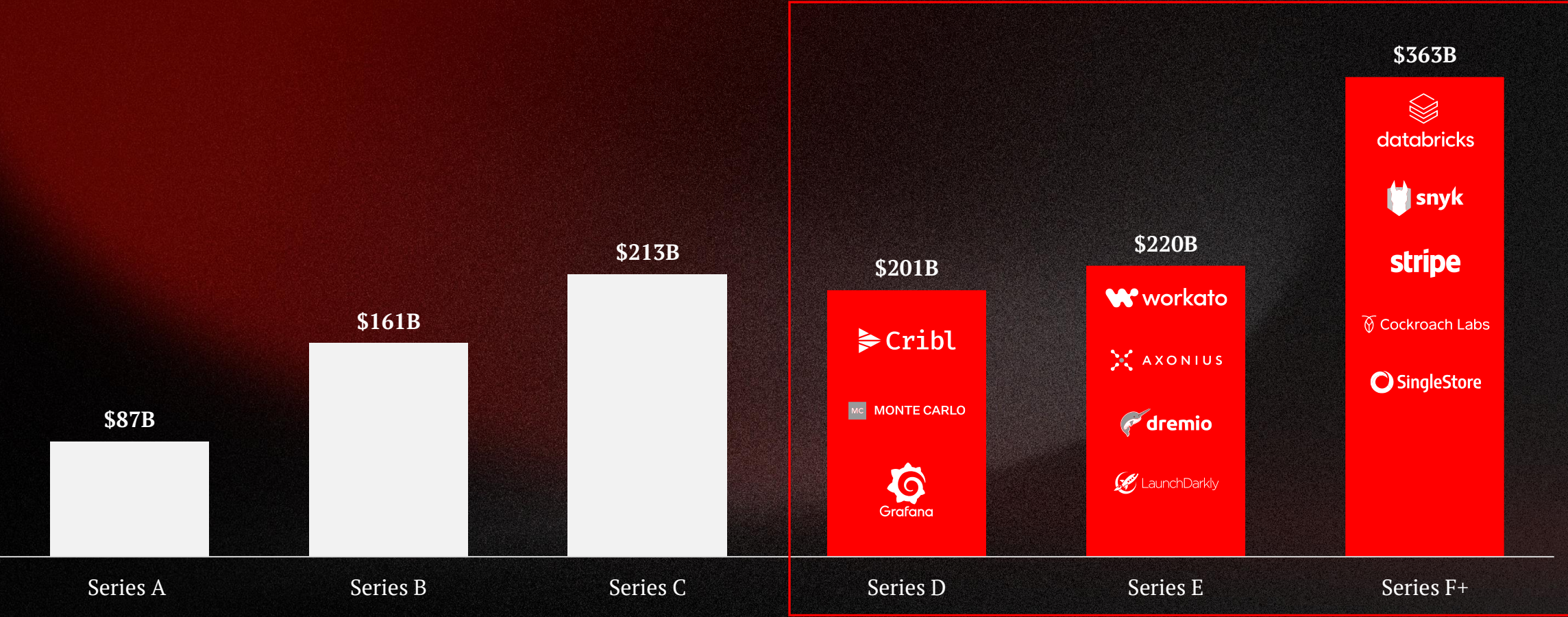
LATE STAGE

		* 			* 
* 		* 			
		* 			
		* 	* 		* 
					
	* 		* 		
		* 			

Late-stage includes startups that have raised more than \$200M in total funding.

There's a backlog of companies that are expected to IPO

Aggregate Valuation of Private Companies by Stage (\$B)



Note: Latest publicly disclosed valuations in Pitchbook as of July 14th, 2023. Aggregate valuation defined as last round valuation disclosed summed. Analysis includes Infrastructure SaaS companies that have raised a venture funding round in the last five years.

The Redpoint Cloud Infrastructure Team



Erica Brescia
Managing Director
erica@redpoint.com



Scott Raney
Managing Director
sraney@redpoint.com



Satish Dharmaraj
Managing Director
satish@redpoint.com



Logan Bartlett
Managing Director
logan@redpoint.com



Sai Senthilkumar
Partner
sai@redpoint.com



Jordan Segall
Partner
jordan@redpoint.com



Pat Chase
Partner
patrick@redpoint.com



Adele Li
Investor
adele@redpoint.com



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