

WOODSIDE CAPITAL PARTNERS

## **INFRAREPORT**

### Top M&A Trends in Infrastructure Software

Tricia Salinero  
Mark Bagley  
Jon Shalowitz

*October 2020*

---



EXECUTIVE SUMMARY	4
1 EVOLUTION OF CLOUD INFRASTRUCTURE	7
1.1 Size of the Prize	7
1.2 The Evolution of the Infrastructure (Public) Cloud Market and Technology	7
1.2.1 Original 2006 Public Cloud - Hardware as a Service	8
1.2.2 2016 - 2010 - Platform as a Service	9
1.2.3 2016 - 2019 - Containers as a Service	10
1.2.4 Container Orchestration	11
1.2.5 Standardization of Container Orchestration	11
1.2.6 Hybrid Cloud & Multi-Cloud	12
1.2.7 Edge Computing and 5G	12
1.2.8 APIs, Cloud Components and AI	13
1.2.9 Service Mesh	14
1.2.10 Serverless	15
1.2.11 Zero Code	15
1.2.12 Cloud as a Service	16
2 STATE OF THE MARKET	18
2.1 Investment Trend Summary -Summary of Funding Activity in Cloud Infrastructure	18
3 MARKET FOCUS – TRENDS & COMPANIES	20
3.1 Cloud Providers Provide Enhanced Security, Including AI/ML and Zero Trust Security	20
3.2 Cloud Management and Cost Containment Becomes a Challenge for Customers	21
3.3 The Container Market is Just Starting to Heat Up	23
3.4 Kubernetes	24
3.5 APIs Have Become the Dominant Information Sharing Paradigm	27
3.6 DevOps is the Answer to Increasing Competition From Emerging Digital Disruptors.	30
3.7 Serverless	32
3.8 Zero Code	38
3.9 Hybrid, Multi and Edge Clouds	43
4 LARGE PUBLIC/PRIVATE ACQUIRERS	57
4.1 Amazon Web Services   Private Company Profile	57
4.2 Cloudera (NYS: CLDR)   Public Company Profile	59
4.3 Hortonworks   Private Company Profile	61

# Top M&A Trends in Infrastructure Software

4.4	Red Hat   Private Company Profile	62
4.5	VMware (NYS: VMW)   Public Company Profile	64
5	PUBLIC COMPANY COMPARABLES	66
5.1	Infrastructure Software and Container Security	66
5.2	Devops	67
5.3	Infrastructure Software	68
5.4	M&A Comparables – DevOps	77
6	PRIVATE PLACEMENT COMPARABLES	79
6.1	Infrastructure Software – Private Placement (Public Companies)	80
6.2	Infrastructure Software – Private Placement (Private Companies)	82
6.3	DevOps – Selected Private Placement	86
7	CONCLUDING STATEMENTS	90
8	SOURCES CONSULTED	93

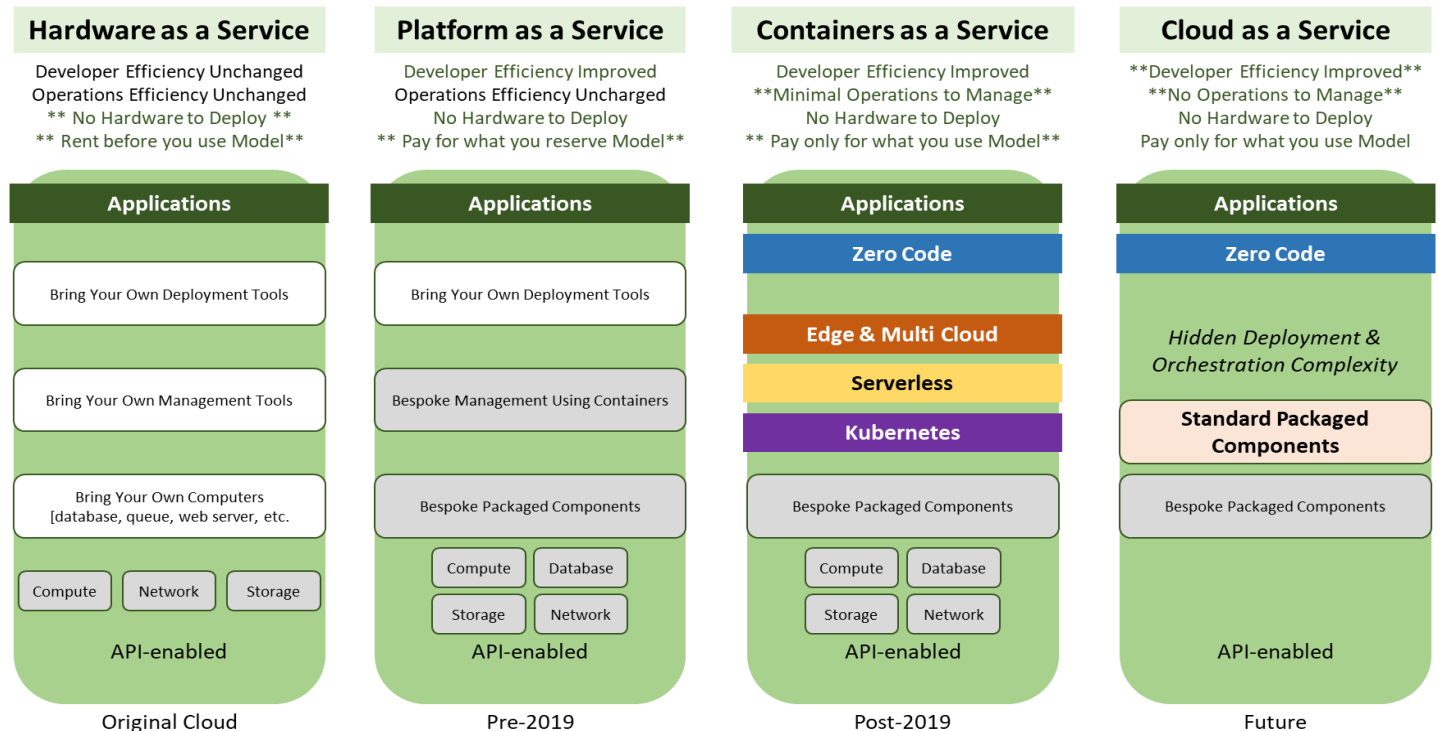
# Executive Summary

The public cloud was born in 2006 with the promise of a magical place where software could be dispatched by developers and it magically becomes available to users. Behind the scenes it was assumed that the cloud was handling all the operation of such software including scaling, security, and performance. And the promise was all this would be provided with unlimited capabilities, in near instant time frames and much lower cost than the current on-premise IT. This was not the reality of the public cloud in 2006 but fast forward 14 years and the cloud has delivered most of this vision.

We at Woodside Capital Partners believe 2020 is not only the year that cloud delivers on these initial promises but also shifts cloud into a whole new phase of innovation. What is this change? It is a series of developments, some delivered more recently, and some have been around for a little while, but combined they are radically reducing the complexity of developing a service in the cloud. So radical a change in fact, that it is now possible to create an internet scale service (used via an application) without creating **a single line of code**. Taking the 2006 vision of code being run by someone else to 2020 when there no code to create. Creating cloud services without developers? Is this possible?

In this report we will take you on the journey from 2006 to 2020, going through the 4 epochs of cloud: **Hardware as a Service**, **Platform as a Service**, **Containers as a Service** and arriving in 2020 and beyond at **Cloud as a Service**.

## Evolution of the Cloud IT Stack



## Top M&A Trends in Infrastructure Software

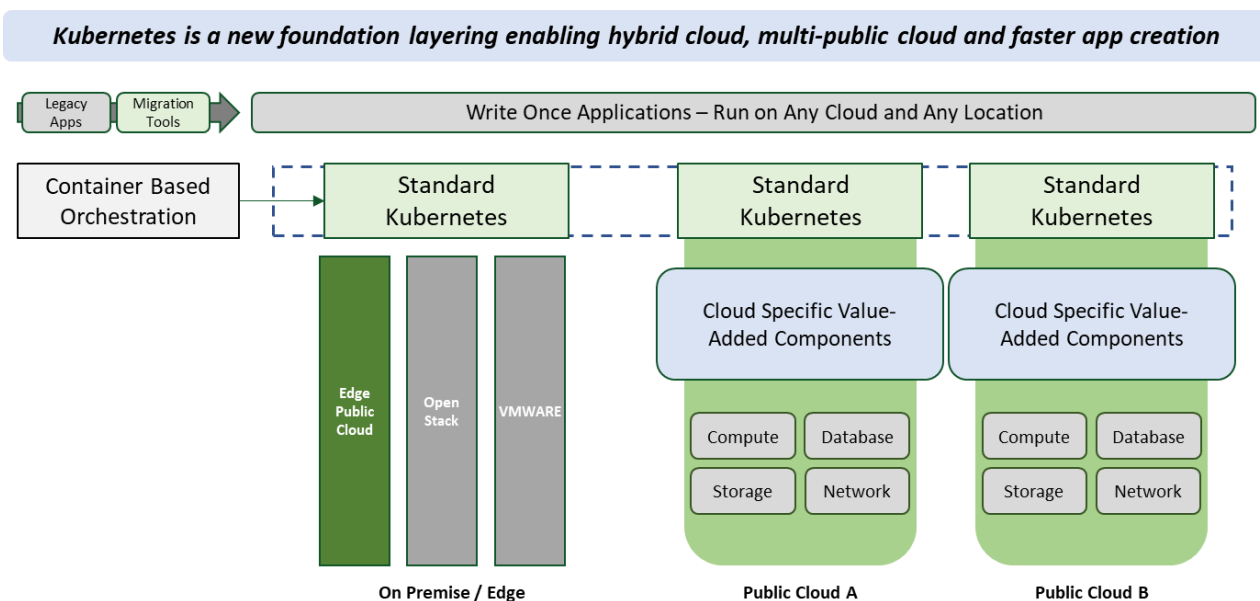
Specifically, in 2019 we saw the following 8 key developments in cloud:

1. The widespread standardization of containers to package up code as components.
2. The prevalence of programmatic interfaces (APIs) for everything.
3. The availability of self-contained re-usable cloud components operated as commercial services.
4. The adoption of Kubernetes as a standard container orchestration platform and layer.
5. The emergence of the Edge as a cloud destination to run cloud services -especially 5G Edge.
6. The recognition from the top 3 cloud providers that enabling apps to operate across clouds raises the cloud interoperation tide for all boats (multi-cloud).
7. The inclusion of enterprise on-premise IT as one of the endpoints for multi-cloud -closing the loop on on-premise versus public cloud. Remember some 80-90% of IT still runs on-premise.
8. The new viability and wide-ranging scope of Zero Code due to the above advances.

This report will consider the separate implications of each of those developments. But perhaps the single most impactful development was the decision by Google to open source the Kubernetes effort and the subsequent adoption of Kubernetes by the industry.

Kubernetes is now the standard orchestration methodology for containers. And containers, over the last 5 years, have become the standard wrapper for applications allowing them to be moved around within and between clouds very easily. But containers generally are components with many containers making up an application. So, containers at the same time made things easier to manage and made them more complex due to the scale of things to manage increasing.

Kubernetes deals with the complexity by automating much of the operation, or orchestration, of containers to provide services on demand. But more importantly thanks to agreements amongst the providers of cloud, Kubernetes can be deployed across the multi-cloud which includes edge and on-premise. When deployed in this manner it effectively forms a new layer across cloud beneath which specific implementation details of the cloud it is running on are largely irrelevant.



Kubernetes is then the platform developers create their components for, and not a specific cloud. And makes any Kubernetes capable service or component service (which is anything that is created as a container) available at any time and in pretty much any location.

And using Kubernetes in this way creates the conditions for Zero Code to thrive. Container based components are described by APIs, which can then be loaded into a web-based drag and drop UI tool to form services in a specific workflow — think joining Lego bricks together.



# 1

## Evolution of the Cloud Infrastructure

### 1.1 Size of the Prize

The cloud infrastructure market is incredibly enticing, as it is projected to be worth \$209B by 2022 with +17 % CAGR from 2018 to 2022<sup>1</sup>.

As has become obvious over the last decade, more than \$1.3 trillion in IT spending will be directly or indirectly affected by the shift to cloud by 2022, according to Gartner (see the table below). Providers that are able to capture this growth will drive long-term success through the next decade.

Cloud Shift Proportion by Category					
	2018	2019	2020	2021	2022
System infrastructure	11%	13%	16%	19%	22%
Infrastructure software	13%	15%	17%	18%	20%
Application software	34%	36%	38%	39%	40%
Business process outsourcing	27%	28%	29%	29%	30%
<b>TOTAL</b>	<b>19%</b>	<b>21%</b>	<b>24%</b>	<b>26%</b>	<b>28%</b>

By 2022, almost one-half of the addressable revenue will be in system infrastructure and infrastructure software, according to Gartner. **System infrastructure will be the market segment that will shift the fastest between now and 2022 as current assets reach renewal status.** Moreover, it currently represents the market with the least amount of cloud shift.



*The shift of enterprise IT spending to new, cloud-based alternatives is relentless, although it's occurring over the course of many years due to the nature of traditional enterprise IT," said Michael Warrilow, research vice president at Gartner. "Cloud shift highlights the appeal of greater flexibility and agility, which is perceived as a benefit of on-demand capacity and pay-as-you-go pricing in cloud.*



### 1.2 The Evolution of the Infrastructure (Public) Cloud Market and Technology

In 2020, some 14 years after its launch, the (Public) Infrastructure Cloud may be on the brink of fulfilling the promise we were given all those years ago. The promise of a magical place in the heavens to which we dispatched our code and billion-dollar unicorns such as Facebook, Netflix, Salesforce and Twitter are created. And in the process, the cloud itself turned into a billion-dollar unicorn. But if you remember in those days 14 years ago cloud

<sup>1</sup>QYReports, August 2018

# Top M&A Trends in Infrastructure Software

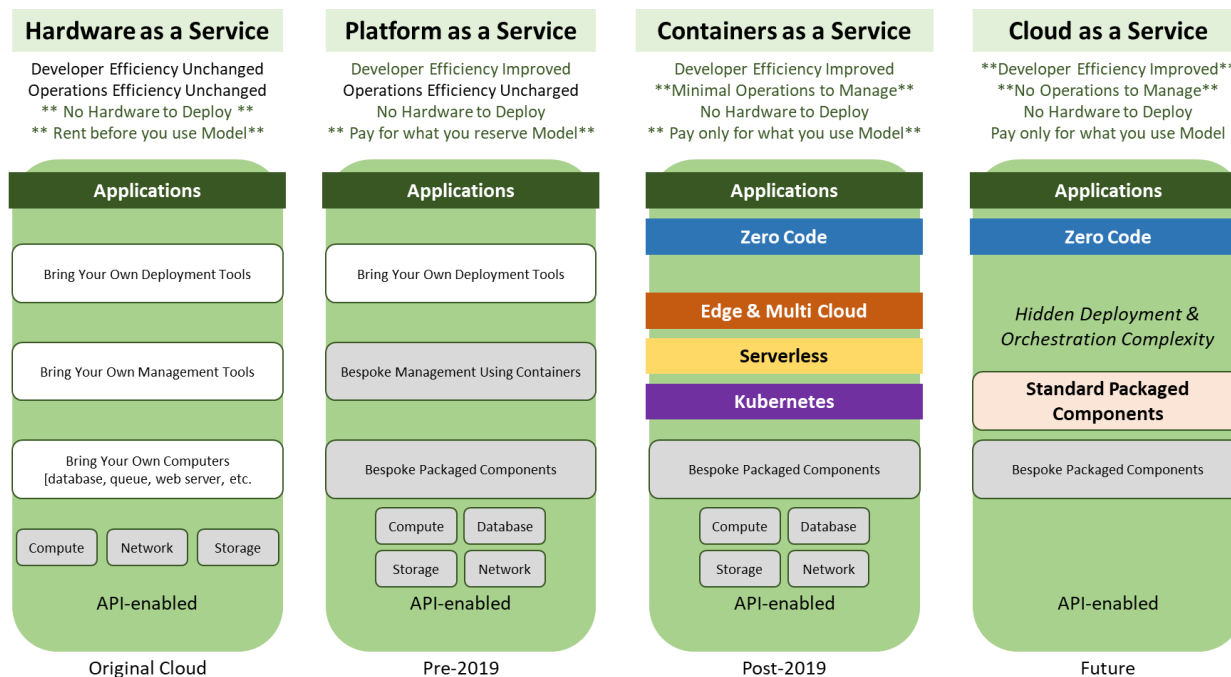
was a bit messy and it required the keenest IT minds to make it work. Much of the IT community was left on the sidelines and have been waiting, somewhat impatiently, for a chance to be involved. 2020 is finally the year the IT community is involved.

If 2006 was the birth of (public) cloud, then 2020 may be the coming of age of cloud. There were some difficult teenage years in-between, when cloud was complex and difficult to manage. Now cloud is about to leave home, start to earn its keep, integrate into society in general and start a new generation of cloud.

*2020 is the year that public cloud becomes accessible to the rest of us*

Let's take that journey from 2006 to understand why 2020 is such a special year.

## Evolution of the Cloud IT Stack



### 1.2.1 Original 2006 Public Cloud - Hardware as a Service

Original cloud, although not the heavenly cloud we wanted, it was pretty radical for what we had prior to 2006. 2006 cloud instead gave us IT Hardware as a Service. It was basically an IT hardware rental business. Which sounds a bit “so what” now, but at the time was amazing. Being able to rent hardware removed about 9 months of effort setting up hardware on-premise with a single swipe of a credit card. So it was possible to rent a server and place code on it running inside a virtual machine and no matter if the application was launched by zero users or a thousand users the cost was just the cost of renting the single server in the cloud. As an aside, in reality if the



application was used a thousand times concurrently more than a single server was likely needed and then things became complex very quickly, at this point in cloud history automated scaling was not available.

*Original 2006 cloud was all about  
rented IT hardware.*

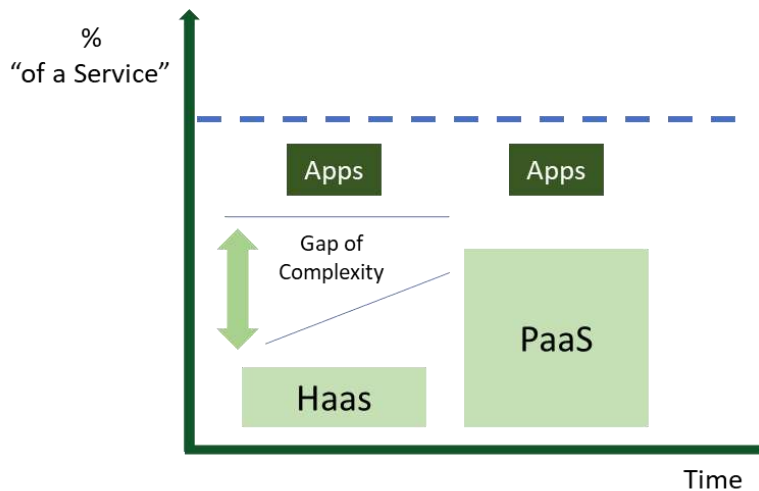
*Although IT hardware procurement had  
changed, IT operations had not.*

### 1.2.2 2010 - 2016 - Platform as a Service

Scaling up and scaling down servers in an automated fashion did not really arrive until 2010, when mature versions of Platform as a Service (PaaS) began to be available. PaaS automated some of the application code start-up and shut-down procedures, thus allowing apps to run on multiple servers and scale with demand with fewer operational expenses. PaaS also started to align the costs of cloud with usage of cloud by being able to switch off resources not being used.

With the advent of this automation came the DevOps movement — developers operating the servers/IT. Why were they running the servers? This was because PaaS turned a 90-day process into a 1-day process almost overnight. Developers could stand up their own IT stacks without the help of a separate department using programmatic interfaces to the IT (APIs).

PaaS was the general term for levels of automation that radically changed the way applications were operated. But embedded in this whole movement were perhaps equally interesting developments of packages of code being operated as a foundation services in the cloud. These were essentially mini platforms built on cloud, and in the cloud, that could be embedded by developers into their applications to minimize the code they needed to create. Examples are database as a service, long term storage as a service, translation as a service, image recognition as a service, text to speech as a service, Hadoop as a service, Machine Learning as a Service, etc. PaaS was a good step forward in usability of the cloud. But there still remained a substantial gap to the vision of a fully automated cloud.



### 1.2.3 2016 - 2019 - Containers as a Service

In 2016 cloud usability took a huge jump forward with the arrival of containers.

*Quick aside on the benefits of containers.* Containers are an iteration on virtual machines, containers were brought into the mainstream by Docker and are a way of packaging up software that has 3 advantages over a virtual machine:

1. Containers run more efficiently on servers — so more applications can be packed on a server.
2. Containers make it easier to move software between servers and opened up the opportunity to move between servers in different heterogeneous clouds.
3. Containers run in such a way that they are much quicker to start up — so software can go from a dead stop to fully running in seconds, which then allows a lot more just in time provisioning to take place in the cloud.

Continuing the growing child analogy, the container era is when cloud goes all professional and business oriented. Containers are the key enabler for a number of subsequent developments that happened in very short order.

***Containers will form the backbone of the new generation of cloud we see in 2020***

Containers effectively make the PaaS methodology work. They are typically much smaller building blocks of code, and not whole applications, this makes them easier to re-use, quicker to start-up, quicker to copy to servers. Enabled by the standardization of a small piece of code that comes along with every container to tell the system what resources are needed to support the container. Rolled up together these advantages mean that code can be copied

to the cloud in advance of being used, and when a request to use the code is received the correct IT resources are created and the code is run to provide a service -including importantly 3<sup>rd</sup> party containers running elsewhere. The cloud in 2016 can rapidly scale up and down and provides many core reusable components that can be included in applications enabling developers to create more feature rich applications quicker.

But containers create a new problem, the existing PaaS methodology can't cope with the scale and complexity of moving around components. And with developers making use of components provided by the cloud services providers, that adds another layer of complexity.

### 1.2.4 Container Orchestration

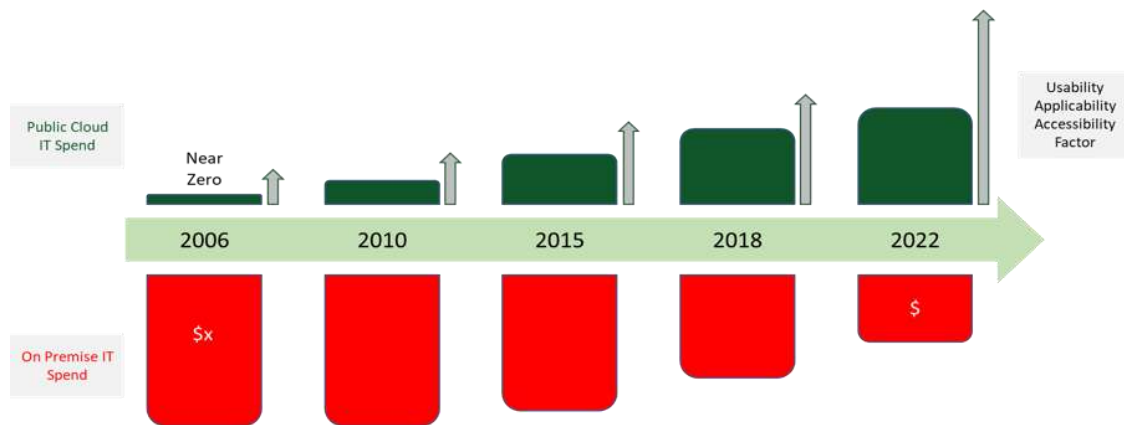
Enter stage left container orchestration, which is similar to PaaS in terms of the outcome but under the covers is doing so while delivering on a whole new level of scale and complexity. Orchestration is basically a very large real time scheduler for containers that provides both the execution and the visibility of where containers are running and what resources they are consuming. If containers are the new building block components, then orchestration is the platform that abstracts away some complexity to allow developers to focus on development and less on operational aspects of what their code needs to operate.

### 1.2.5 Standardization of Container Orchestration

A major factor in the rapid development and widespread deployment of orchestration was Google's decision to standardize their orchestration engine called Kubernetes.

Standardization of Kubernetes enabled it to be a unifying layer covering all the complexity of where and how code is deployed. Taking away from app developers and their operations team the need to worry about where the code would run and what was supported. Kubernetes being available at a location, whether that be private cloud or public cloud, meant that a certain level of functionality existed. Note, in reality this uniformity of resources is enabled by configuration with the Kubernetes bundle.

As we hurtle headlong into a world where " the answer is cloud, what is the question", let's not forget on-premise enterprise IT. According to Gartner estimates, 28% of spending within key enterprise IT markets will shift to the cloud by 2022, up from 19% in 2018. Not that this is news anymore, but growth in enterprise IT spending on cloud-based offerings will be faster than growth in traditional, non-cloud IT offerings. Despite this growth, traditional offerings will still constitute 72% of the addressable revenue for enterprise IT markets in 2022.



The good news is that containers and container orchestration is not just for public cloud, containers can move and be orchestrated to run on-premise as well and indeed transfer between on-premise and the public cloud. So application components can be run where they run best. If there are some paid for servers on-premise then run the code there. If more capacity is needed, then run some components in the cloud. If image processing of very large volumes of images is needed, then run that locally and then upload the results to the cloud. That sounds like a very complex situation, how is that enabled? Simply by adding a Kubernetes layer to your on-premise IT, now the on-premise location can run the same code as in the public cloud.

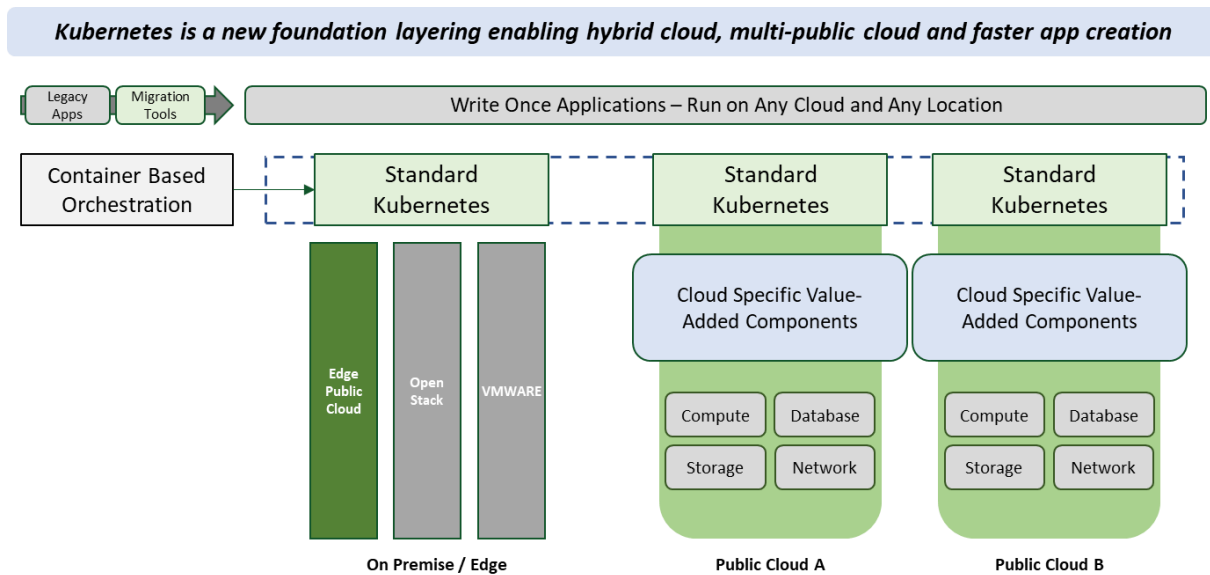
### 1.2.6 Hybrid Cloud & Multi-Cloud

So, any heterogeneous service, public cloud, edge, on premise, that supports Kubernetes becomes just another homogeneous hub on which a container-based application can be deployed and run. This clearly then enables hybrid cloud and multi-cloud as just normal ways code can be deployed. Containers are the things that get moved around and orchestration, specifically Kubernetes, is the means to move them around automatically to cope with demand.

### 1.2.7 Edge Computing and 5G

This is also good for Edge (Edge as defined by the Telcos), where code can be placed nearer to the user at the edge of the mobile network. Thereby making use of the lower latency and the higher speeds of 5G to offload processing in the cloud (in this case at the Edge Cloud) versus on the device. Something that normally can't happen in real time due to transit delays to clouds distant from the user.

The advent of the Kubernetes layer is also good for “edge situations” in other verticals such as a warehouse, retail store, manufacturing plant or construction site. Where the devices are thousands of sensors per site and there needs to be some pre-processing of that data at the edge to make real time decisions.



### 1.2.8 APIs, Cloud Components and AI

Programmatic interfaces have also progressed with cloud in parallel. Workflows now exist to take uncompiled raw source code from multiple developers, compile it into executable components, deploy this code using containers and Kubernetes to various clouds and then manage the execution of this code. All automatic from initial source code transfer.

This means code is going live immediately, compare this to 2006 and immediate code deployment was a 90-day process.

As mentioned earlier, the continuous creation and availability of common PaaS cloud components hosted in the cloud as a service are perhaps the secret story behind the success of the cloud and certainly are the reason why Zero Code (see later in this report) can work and is going to change everything about the way we use the cloud. Perhaps the biggest example of components becoming available as services from the cloud are AI components. The availability of fundamental and very powerful complex analysis made available via a simple API call has taken the sophistication of applications to a new level almost overnight — certainly in the space of a single year, 2019.

AI is also an emerging component in many new projects that will have a profound impact on the software development and management process. Machine learning techniques are being used to improve automation and provide predictive analytics across the infrastructure management domain as well as within the software development process as well. Large enterprises' investment in development is so great that aggregated insights and automating the software delivery and problem is a substantial market of its own.

As is well known now, Enterprise software companies are integrating AI capabilities into cloud-based enterprise software and bringing them to the mass market:

1. Salesforce, for instance, integrated its AI-enabled business intelligence tool, Einstein, into its CRM software in September 2016; the company claims to deliver 1 billion predictions per day to users.
2. SAP integrated AI into its cloud-based ERP system, S4/HANA, to support specific business processes such as sales, finance, procurement, and the supply chain. S4/HANA has around 8,000 enterprise users, and SAP is driving its adoption by announcing that the company will not support legacy SAP ERP systems past 2025.
3. A host of startups are also sprinting into this market with cloud-based development tools and applications. These startups include at least six AI “unicorns”. Some of these companies target a specific industry or use case:
  - a. CrowdStrike, a US-based AI unicorn, focuses on cybersecurity
  - b. Big Panda uses AI to improve Enterprise cross-platform incident resolution.

Woodside Capital Partners offer a comprehensive view of the AI landscape in a separate report.

### 1.2.9 Service Mesh

Something we have mentioned a couple of times but not described in detail is the configuration file that moves around with containerized code as it is deployed. This has evolved from a simple file that came with a container to say what it needed to run — it needs Java version X for instance. As containers were packaged up into services, this became quite an involved list of requirements for cloud services. For example: database, storage, machine learning, image recognition, commerce, web server. The workflow that describes what is needed where and for how long is called “service mesh”.

Service mesh and the workflows they support are at a nascent stage at present and will most likely be an area where a large amount of innovation can be expected. Innovation can be expected in:

1. how containers are created and managed.
2. how resources are deployed.
3. how the software lifecycle is automated.
4. how operations are scaled efficiently.
5. how to cope with hybrid situations.
6. how to deal with security of containers and code and highly fluid automated situations.



### 1.2.10 Serverless

A further development that comes directly from containers being able to rapid start is serverless. Serverless is a change in the way services are offered to developers by the cloud providers. As we mentioned before, normally a developer has to rent sufficient amounts of IT hardware and IT services to cope with the expected amount of use — which was a bit of a guess and either meant your service had rented IT resources sitting idle or not enough rented IT services and your service could not cope with increases in load.

***Serverless finally aligns 1:1  
the cost of cloud services  
with the use of cloud services***

In the serverless world, application code is uploaded and the cloud takes care of putting in place all the components needed based on a configuration file sent with the code. All these components remain idle and are deployed **only** when a request arrives from users. Only at this point will the developer be charged for the use of these components. With serverless cost of IT resources is directly proportional 1:1 with IT resources used.

Not only is serverless a cost saver in absolute terms it is also negates the need for a developer to have an operations team. Normally the operations team will monitor usage and allocate more resources as needed. Cloud now takes care of this.

### 1.2.11 Zero Code

Zero Code is the concept of being able to create an application without creating any code. How is this possible? By outsourcing pieces of functionality of your application's capabilities to pre-created cloud component, cloud components that are offered as services cloud providers and 3<sup>rd</sup> parties. The process of connecting these components is quite straightforward, the end result is a workflow to provide a service or application. Visual tools

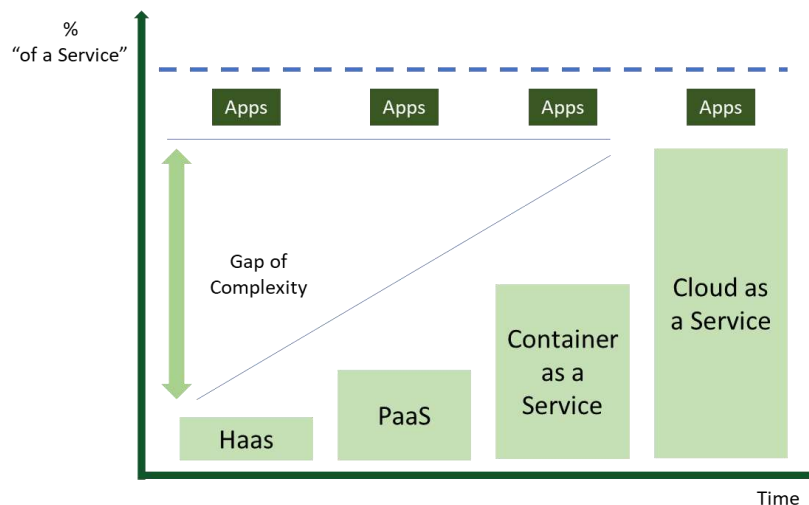
***Zero Code means you no longer need  
to code to create applications.***

***The impact on the IT industry will be  
fundamental and wide ranging.***

exist to graphically connect these components, all of the interfaces are published via the APIs and so a simple Lego Block type plug and play approach can be taken in a simple design tool. All these tools do is connect the output of one component with the expected input of another component, hence zero code needed.

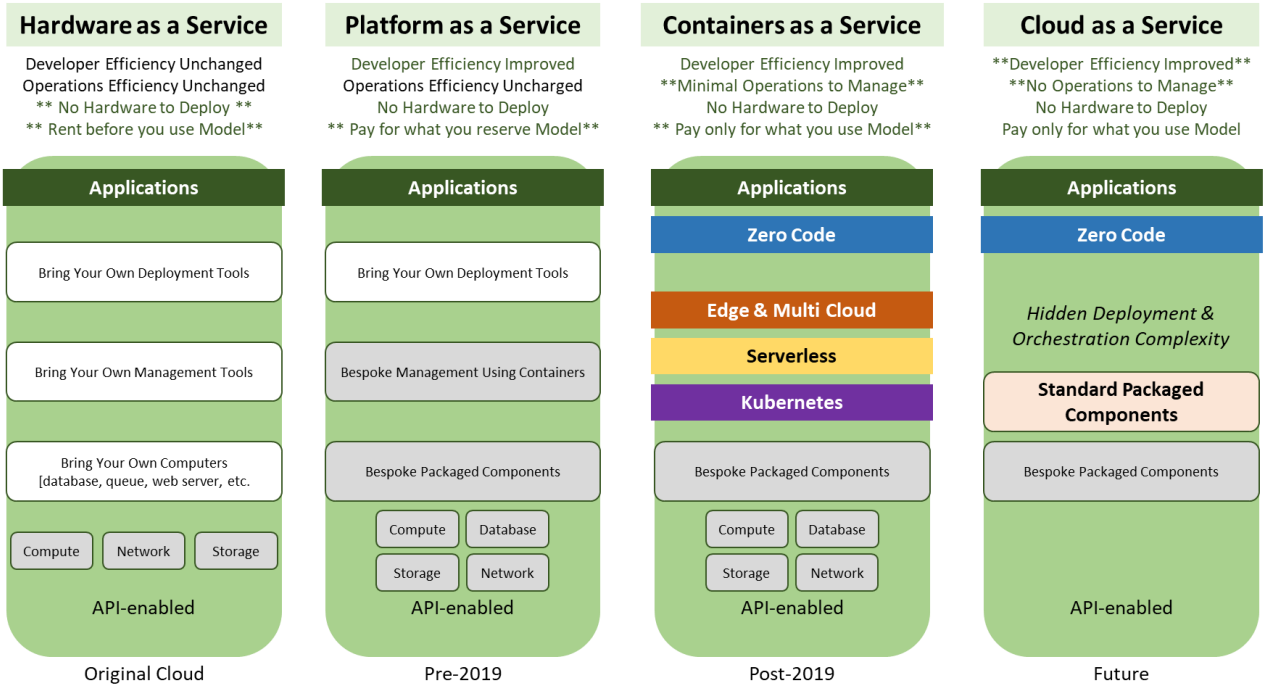
### 1.2.12 Cloud as a Service

In 2020 we are finally seeing the full promise of cloud as a full-service platform for running software. What does that mean? It means no matter what the category of application developer: an individual; a founder in a startup or a developer in large corporate IT department, the capability exists to create an app on a laptop, then simply send it to the cloud and everything to do with running that service at scale globally is now handled by the cloud automatically — importantly, for the first time, only paying for cloud only when the application is used.



The combination of containers, APIs and cloud components, Kubernetes and serverless brings us to 2020. From 2006 to 2020 the cloud has systematically closed the “Gap of Complexity” experienced by the first users of cloud. A perfect example of the complexity of cloud, AWS offers 180 different versions of servers. This is great flexibility, but for someone who is not deep into knowing what they need it is intimidating, serverless makes this choice for you based on how your application behaves. This gap did get smaller over the years but never quite became a service that handled everything for you, as was promised in 2006, until now. Now everything is handled for you, and even the commercial model is straight forward.

Evolution of the Cloud IT Stack



# 2

## State of the Market

### 2.1 Investment Trend Summary -Summary of Funding Activity in Cloud Infrastructure

#### Transaction Activity

- Strong M&A activity with 1,991 deals in LTM totaling around \$220B
- Private company M&A activity remains at historic record levels with 1,961 deals in LTM out of which megadeal volume was 20 deals over \$1B
- Public transaction volume of 30 deals LTM is close to the near term record of 33, with deals over \$1B also near its highest levels
- IPO activity has been strong with 6 deals in the quarter all performing well

#### M&A Outlook

- M&A activity remains very strong with Q3'19 representing a big jump after the pullback in Q2'19 with no near term signs of a reduction in buyer appetite
- Nearly 513 deals were recorded in Q3'19, the third highest quarterly deal count as buyer appetite remains very strong
- M&A dollar volume of \$68.3B bounced back considerably, just below the record of \$75.4B
- With multiples near historic highs and a highly competitive deal environment, sellers tend to show increased optimism
- There is risk that a market correction in the next 12-24 months would put downward pressure on M&A activity levels and valuations as public multiples have pulled back a bit already

#### Recent Investments

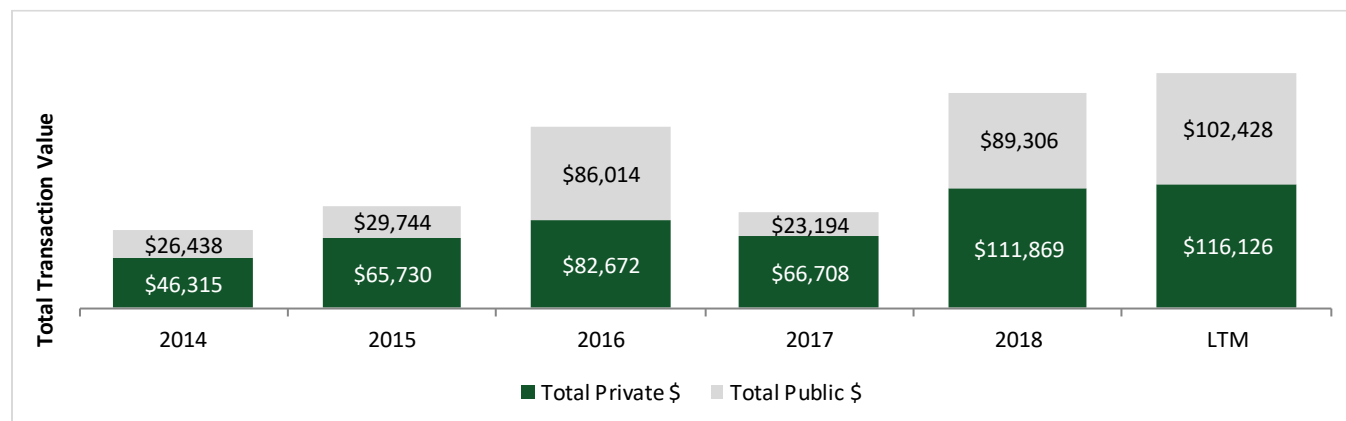
<b>\$28MM - Series B</b> <b>Armory</b> (2019, California, \$42MM)	<b>\$2,100MM - Buyout</b> <b>Presidio</b> (2019, New York, \$691.6MM)
<b>\$56MM Series D</b> <b>CircleCI</b> (2019, California, \$112.5MM)	<b>\$268MM - Series E</b> <b>Gitlab</b> (2019, Georgia, \$413.8MM)
<b>\$25MM - Series B</b> <b>Volterra</b> (2019, California, \$50.0MM)	<b>\$25MM - Series A</b> <b>Gravitational</b> (2019, California, \$32.1MM)
<b>\$206MM - Series E</b> <b>Data Robot</b> (2019, Massachusetts, \$431.1MM)	<b>\$1050MM - Buyout</b> <b>SignalFX</b> (2019, California, \$178.5MM)

#### Most Active Investors

<b>Seed</b>	<b>.406 Ventures (#2), SV Angel (#2), Birchmere Ventures (#2)</b>
<b>Series A/B</b>	<b>Andreessen Horowitz (#3), Bain Capital Ventures (#3), Battery Ventures (#3)</b>
<b>Series C+</b>	<b>Accel Partners (#2), Cisco Investments (#2), Meritech Capital Partners (#2)</b>
<b>Incubators</b>	<b>500 Startups (#3), Alchemist Accelerator (#3), Acceleprise (#1)</b>
<b>Other Notable Investors</b>	<b>Accomplice (#3), Dell Technologies (#3), Goldman Sachs (#3)</b>
<b>Debt Investors</b>	<b>Silicon Valley Bank (#3), Trinity Capital Investment (#2), BlackRock (#1)</b>

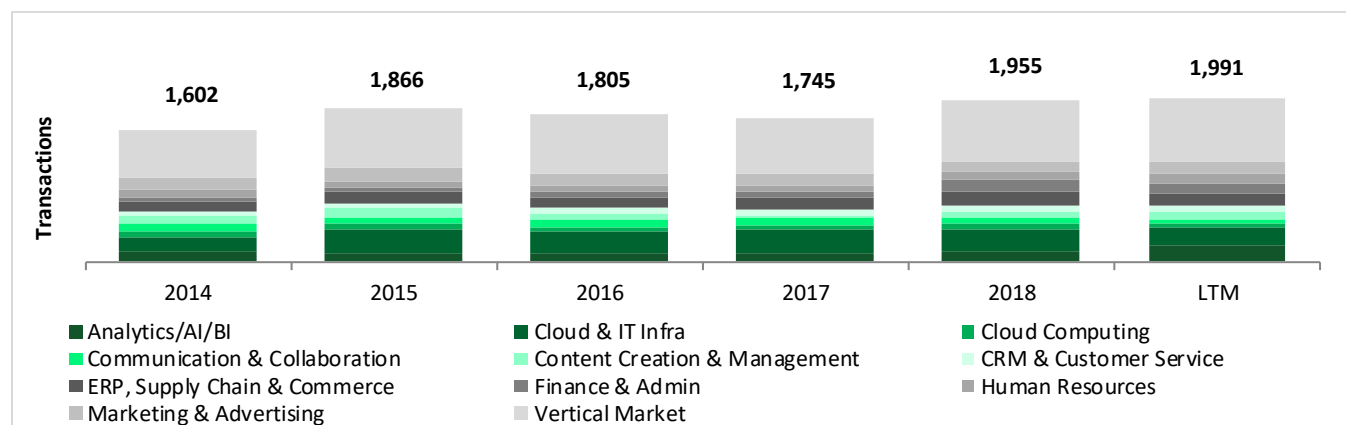
# Top M&A Trends in Infrastructure Software

## LTM<sup>(1)</sup> M&A Dollar Volume



- Megadeals tend to drive dollar volume with nine deals north of \$5B in LTM led by IBM's acquisition of Red Hat (\$34B in Oct'18); Salesforce's acquisition of Tableau (\$17B in Jun'19) and Broadcom's acquisition of Symantec's enterprise security business (\$11B in Aug'19)
- Lower dollar volume in 2017 was driven by a lack of megadeals
- Q3 M&A dollar volume of \$68B marks the second highest quarter in history, falling just short of the Q4'18 record of \$75B
- \$1B+ deal count of 11 for the quarter has only been topped once in Q2'18 which saw 15 deals

## LTM<sup>(1)</sup> M&A Transaction Volume by Segment



- The Vertical Market is by far the largest segment by deal count, representing roughly 40% of LTM transaction volume
- Cloud & IT infrastructure also posted very strong deal volume with the continued transition to the cloud driving M&A activity
- Human Resources and Analytics/AI/BI are both seeing strong increases in deal volume over the past two years

<sup>(1)</sup>LTM as of Q3'19

# 3 Market Focus – Trends & Companies

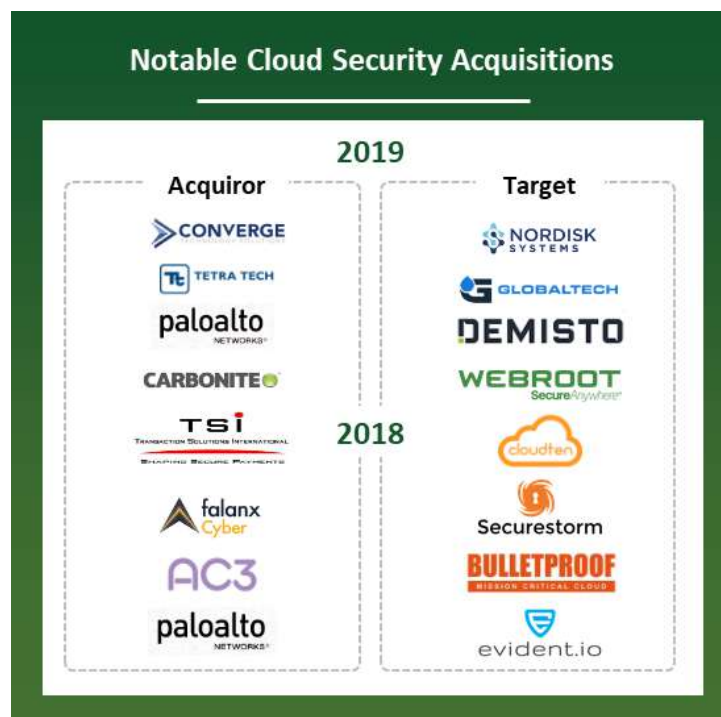
## 3.1 Cloud Providers Provide Enhanced Security, Including AI/ML and Zero Trust Security

Cloud computing immediately created value for enterprises by removing the need for expensive hardware. However, cloud computing also created security risks. With companies steadily migrating to the cloud, information worth billions of dollars is vulnerable and available to persistent hackers. Companies of all sizes are at risk. In fact, major companies are the most targeted as they have the most value; Amazon, Apple, Facebook, Microsoft, Dropbox, and LinkedIn have all been the victim of cloud security breaches.

Cloud providers clearly risk significant franchise damage if they cannot keep customer data safe and this is likely a key differentiator as they jump the chasm and pursue traditional enterprise adopters. Hence, cloud security acquisitions have heated up recently, and we anticipate they will continue as cloud security is a must-have capability and hackers show no sign of slowing their efforts and capabilities. Key capabilities of cloud security companies are varied, from single sign-on (SSO) and monitoring, and artificial intelligence (AI) and Machine learning (ML) are proving to be useful advanced capabilities to provide both behavioral and predictive analysis for cloud vendors.

Notable cloud security acquisitions include:

- VMware's \$2.3BN acquisition of Carbon Black.
- Carbonite's \$618MM acquisition of Webroot.
- Palo Alto Network's \$490MM acquisition of Demisto, \$150MM acquisition of Aporeto, \$300MM acquisition of Evident.io and quick follow-up acquisition of RedCanary in 2018.
- Trend Micro's acquisition of Cloud Conformity, a "cloud security posture management" firm for \$70MM.
- Symantec acquisition of Luminate Security for \$200MM.



Zero Trust Security is a relatively new architectural approach to network security that requires strict identity verification for every person and device trying to access resources on a private network, regardless of whether they are sitting within or outside of the network perimeter. This approach has become popular several years after Google



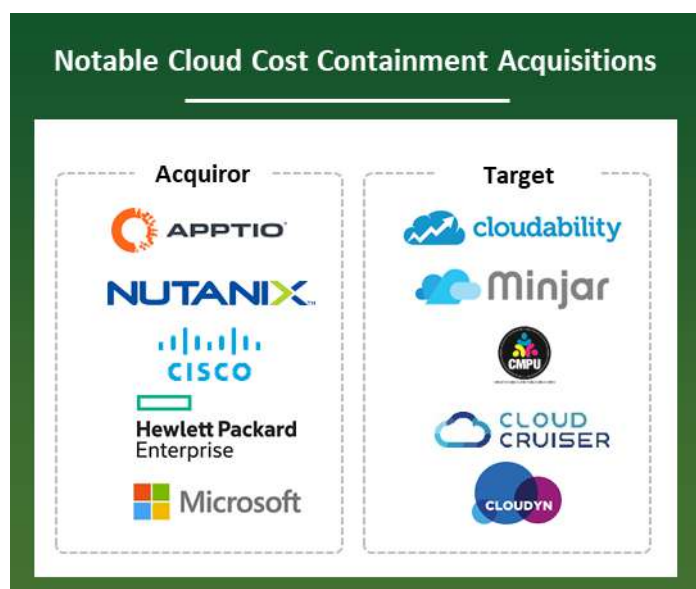
launched their implementation called “BeyondCorp”<sup>2</sup>. It has become yet another example of what many in Silicon Valley are calling GIFEE or “Google Infrastructure For Everyone Else”. Essentially, Zero Trust Security is a reaction to the legacy approach of using network perimeter firewalls to defend internal networks from intruders but not really enforcing many boundaries once in the network. This paradigm created significant risks once a hacker has gained access to the internal network which only become worse given the growth of mobile devices and using contractors. This approach is gaining popularity as a modern way to resolve many existing internal networking security risks, existing security and cloud companies are scrambling to add it to their capabilities.

### 3.2 Cloud Management and Cost Containment Becomes a Challenge for Customers

Moving workloads to the cloud has greatly improved operational efficiency and collaboration, but it has also proven to be costly. Why? Customers are far more immature in using their cloud infrastructure in an efficient manner versus their traditional legacy infrastructure. In fact, cloud wastage is a problem that hinders cloud adoption.

Cloud wastage manifests in several ways: from buying too much computing power to running virtual machines 24/7. Frequent changes in pricing also exacerbates spending matters. Right Scale estimates that customers’ waste 35% of their cloud spend; that equates to \$10B wasted annually for AWS, Microsoft Azure, and Google Cloud Platform customers.





Beyond cloud waste, system platform and management vendors want to be relevant to the rapidly growing cloud computing market and understand that managing and operating cloud computing is a new operating paradigm that requires new platforms and tools. This has created opportunities for new breed vendors like Atlassian and Splunk to enter this lucrative market with the acquisitions noted below after ServiceNow made an early move in 2016.



Cloud providers are not likely to undersell or preemptively downgrade customers, but they can make customers feel better about cloud usage. While Microsoft acquired Cloudyn to help customers monitor and maximize the efficiency of cloud usage, HPE went a different route. Recognizing price as a barrier to private cloud adoption, HPE purchased Cloud Cruiser. This strategic move allowed HPE to offer a flexible, pay-as-you go payment option for customers.

<sup>2</sup><https://cloud.google.com/beyondcorp/>

## Companies Providing Cloud Infrastructure Costs Savings Services

 <b>CLOUDPHYSICS</b>	<p><b>Cloud Physics</b> provides software that is focused on providing analytics for virtualization administrators, architects and data center operators, helping in VM resource management, infrastructure performance engineering, storage architecture and application performance management, enabling clients to plan and execute public, private and hybrid cloud migration. The company raised \$15MM of Series D venture funding from DoubleRock and other undisclosed investors on July 1, 2016.</p>
	<p><b>Spot (formerly SpotInst)</b> provides a cloud-based IaaS platform designed for running and managing elastic compute cloud. The company's cloud-based platform leverages predictive algorithms automates management and purchase policies for cloud services. The company raised \$35MM of Series B venture funding in a deal led by Highland Europe on August 28, 2018. Intel Capital, Vertex Ventures Israel and Leaders Fund also participated in the round. Directors and board observers include: Gajan Rajanathan (Highland Europe), Andrew Fligel (Intex Capital), Aviad Ariel (Vertex Ventures)</p>
	<p><b>Cloudcheckr</b> provides a cloud cost management platform designed for AWS. The company raised \$15MM of Series A1 venture funding in a round led by Level Equity on March 20, 2017, putting the pre-money valuation at \$145MM. Other undisclosed investors also participated. Directors and board observers include: Benjamin Levin (Level Equity), Code Cubitt (Mistral Venture Partners)</p>
	<p><b>CloudEndure</b> provides disaster recovery and live migration services intended to mobilize entire workloads to and across clouds. The Company was acquired by Amazon.com for an estimated value of \$250MM on January 10, 2019. Previously, the Company raised \$13MM of Series B venture funding in a deal led by Infosys and Magma Venture Partners on April 13, 2016. EG Capital Advisors, Dell Technologies Capital and other undisclosed investors also participated. Directors and board observers include: Yair Snir (Dell Technologies Capital), Modi Rosen (Magna Ventures)</p>

### 3.3 The Container Market is Just Starting to Heat Up

Containerization software and container orchestration technology like Docker and Kubernetes have exploded recently, as they are considered a core “Cloud Native” cloud infrastructure platform component. In fact, the container market is the fastest growing segment of the cloud-enabling technologies market. 451 Research estimates that the container market will grow at a CAGR of almost 40% through 2020 to reach \$2.7B. Currently, Kubernetes is driving most of this category’s cloud market growth, but Docker helped launch the category when they pivoted from their DotCloud model in March 2013. However, Docker has been late to introduce enterprise-level product and Kubernetes intervened to fill in the market gap.

System platform vendors and cloud providers are acquiring containerization and container orchestration technology in order to speed up and scale cloud deployments. This is critical as customers trend towards a more hybrid or multi-cloud model. Open source technology is especially desirable. Several acquisitions have been made in the container arena:

- Red Hat’s acquisition of CoreOS in January 2018.
- VMWare’s acquisitions of Heptio, Bitnami and Pivotal in late 2018 through mid 2019.
- Palo Alto’s recent acquisitions of Aporoto and Twistlock.

Red Hat’s move was a big challenge to Docker, the container market leader, for the enterprise market. CoreOS’s container management technology Tectonic will greatly enhance Red Hat’s open source enterprise solution, OpenShift. The acquisition further pressured Docker to commercialize Docker Enterprise Edition.

We foresee intensified competition yet consolidation of the container market as cloud providers implement an acquisition strategy. Revenue for the container software market is anticipated to grow 30% annually from 2018 to 2023 — surpassing \$1.6 billion — according to a recently published IHS Market report.



### Companies Providing Container Management Services



**Rafay** is the developer of a turnkey SaaS platform designed to automate ongoing operations and lifecycle management for containerized applications. The company's platform governs, monitors and manages clusters as well as feature cluster blueprinting and enterprise-ready integration tools, enabling developers and operations teams to focus on building applications instead of writing and maintaining complex infrastructure code.



**Stratoscale** is the developer of a virtualization technology designed to focus on leveraging technology to help IT teams make better and more profitable use of existing infrastructures. The company's virtualization technology is utilized to create hyper-converged Operating System for data centers that use the rack as its design paradigm, in contrast to the traditional, single-server paradigm, enabling clients to create totally new foundation software stack to run, scale and optimize data center operations.



**Diamanti** is the developer of an enterprise platform designed to solve network and storage challenges. The company's platform gives infrastructure architects, IT operations and application owners the speed, simplicity, efficiency and control they need to run stateful containerized applications in production, enabling developers to specify their network and storage resources and service levels

### 3.4 Kubernetes

Organizations are always searching for ways to make their technology infrastructure more scalable and flexible. One relatively recent example of this is the use of containers. Containers are essentially a way to isolate an application's compute and resource allocation needs in a cloud-transportable package of code. As a visual metaphor think of a lego block. 451 Research predicts the cloud-enabling technology market to grow to \$39.6B through 2020, and containers are predicted to be the fastest growing segment of that market at 40%. Gartner predicts that "by 2020, more than 50% of global organizations will be running containerized applications in production". And once you have containers, you need another set of tools for managing containers (if you give a mouse a cookie) – the container orchestration layer. The most popular container management framework is Kubernetes, an open source project and community, launched in 2015. Kubernetes defines a standard for abstracting containers into groupings called pods and allowing for those pods to be managed based on similar compute needs. On Kubernetes, all applications run in containers, so they may be isolated from one another, to further deploy and develop. And this isolation allows for multi-cloud and hybrid cloud deployments. Actual production programs might span a number of containers or pods.


With the rising popularity of Kubernetes, companies both big and small are getting in on the act. Amazon announced its version of a Kubernetes-conformant tool in 2017, called Amazon Elastic Container Service for Kubernetes, or Amazon EKS, with general availability in June 2018. Microsoft announced its Azure Kubernetes Service at Ignite 2018, as well as a public preview of an instance of Kubernetes running on an Azure Stack, allowing deployment in an on-prem environment for Windows Server (smaller deployment, less money, call it a try-before-you-buy option). Docker, famously known as the king of containers, built their own container management tool called Docker Swarm – which now, (yep, you guessed it) supports Kubernetes and Swarm in the same cluster. Pivotal, VMware and Google are providing Pivotal Container Service (PKS, 'K' for Kubernetes). Other major vendors that have made their bet on Kubernetes include IBM and Red Hat. A host of startups have built their business around providing tools to either provision Kubernetes in the cloud, or aid in some other way the integration of various services.

## Companies Providing Container Management Services

	<p><b>Portworx</b> storage product maintains stateful services in containers at scale – particular important if you have petabytes of data with high availability needs. The company raised \$27MM of Series C venture funding in a deal co-led by Sapphire Ventures and Mubadala Investment Company in March 2019, putting the pre-money valuation at \$110MM. GE Ventures and Mayfield participated. Directors and board observers include: Michael Dolbec (GE Ventures), Naveen Chaddha (Mayfield), Abhishek Shukla (HPE Ventures); Jai Das (Sapphire).</p>
	<p><b>Rancher Labs</b> (acquired by SUSE) built a container management system based on Kubernetes that will allow anyone to build a private cloud for Docker from any cloud or physical server. Moreover, Rancher will run applications and services on “herds of containers that can roam across Kubernetes clusters and clouds”. Run by ex-Citrix CTO, Sheng Liang, Rancher Labs raised \$25MM of Series C venture funding in a deal co-led by New Zealand Venture Investment Fund, F&amp;G Ventures and Mayfield Fund in July 2019, putting the company's pre-money valuation at \$145MM. Nexus Venture Partners, GRC SinoGreen Fund and Trans-Pacific Technology Fund also participated in the round. Directors and board observers include: Jishnu Bhattacharjee (Nexus); Ursheet Parikh (Mayfield).</p>
	<p><b>Diamanti</b> has developed an appliance designed for containerized networking, persistent storage and applications. The company's appliance combines the ease of hyper-converged infrastructure with unparalleled performance and efficiency of bare-metal Docker containers. Run by a former Cisco senior director of engineering, Jeffrey Chou, the company raised \$8.3MM of Series B2 venture funding from Northgate Capital and TransLink Capital in April 2018, putting the company's pre-money valuation at \$66MM. Directors and board observers include: Thorsten Claus (Northgate); Sung Park (TransLink).</p>
	<p><b>AVI Networks</b> is multi-cloud enabled software for auto-scaling application services, per-app load balancing, predictive autoscaling, application insights, security, and automation – works with Kubernetes and container technology. In June 2019, VMware (NYSE:VMW) agreed to acquire the Company. Previously, the Company raised \$60MM of Series D venture funding led by Cisco Investments on June 2018, putting the company's pre-money valuation at \$27MM. Lightspeed Venture Partners, Greylock Partners, Menlo Ventures and DAG Ventures also participated in the round. This brings company's total funding to \$11MM. Directors and board observers include: Asheem Chandna (Greylock); Mark Anderson (Palo Alto Networks); Barry Eggers, Arif Janmohamed (Lightspeed); Venky Ganesan (Menlo); Rob Salvagno (Cisco).</p>
	<p><b>DigitalOcean</b> is a provider of a cloud computing platform designed to simplify cloud computing for developers. The company offers a scalable compute platform with add-on storage, security and monitoring capabilities. The Company has raised nearly \$200MM from Mighty Capital, Black River Ventures, Hanaco Venture Capital and EG Capital Advisors. Directors and board observers include: SC Moatti (Mighty Capital).</p>



## Top M&amp;A Trends in Infrastructure Software

	<p><b>HashiCorp</b> is a provider of cloud infrastructure automation tools designed to provision, secure, connect and run any infrastructure to help enterprises address the realities of multi-cloud. The Company raised undisclosed amount in a later stage venture funding deal led by TCV. Mayfield Fund and True Ventures also participated in the round. Directors and board observers include: David Yuan (TCV)</p>
	<p><b>D2iQ (FKA Mesosphere)</b> provides an API platform designed to take production container operations and data services automation to the next level. The company's interface combines data center servers and cloud instances into one shared pool. The company raised \$125MM of Series D venture funding in a deal led by T. Rowe Price and Koch Disruptive Technologies on May 7, 2018, putting the company's pre-money valuation at \$650MM. Zhongwei Capital, Qatar Investment Authority, Disruptive Technology Advisers, Andreessen Horowitz, Two Sigma Ventures, Khosla Ventures, Hewlett Packard Pathfinder, SV Angel, FUEL Capital, and Triangle Peak Partners also participated in the round. Directors and board observers include: Bruce Armstrong (Khosla Ventures), Peter Levine (Andreessen Horowitz), Jason Franklin (Andreessen Horowitz).</p>
	<p><b>AgileStacks</b> is a provider of automated cloud development and deployment services intended to reinvent how enterprises implement clouds. The company's automated cloud development and deployment services select, assemble and deploy stacks in the cloud. The company raised \$6.00 million of Series A venture funding in a deal led by Rosecliff Venture Partners on December 1, 2018, putting the company's pre-money valuation at \$15 million. Hewlett Packard Pathfinder, Canaan Partners and Alumni Ventures Group also participated in the round.</p>
	<p><b>XebiaLabs</b> provides enterprise DevOps and application release automation tools created to automate and standardize complex application deployments. The company's enterprise-scale continuous delivery and DevOps software offer tools to plan, automate and analyze the entire software release pipeline. The company was acquired by CollabNet, via its financial sponsor TPG Capital, through an LBO on January 21, 2020.</p>
	<p><b>Weaveworks</b> has developed SaaS-based platform designed to connect, observe and control docker containers. The company's platform provides a portable and resilient way to network, visualize and interact with the app in real time and manage containers and microservices. Having a registry within Kubernetes cluster could provide a lot more control and logging capabilities including full audit log of operations, integration with existing authentication and authorization solutions, advanced distribution options for quick deployment of image updates, support for immutable tags and image streams, and integration with vulnerability scanners. The company raised \$15 million of Series B venture funding in a deal led by GV on May 11, 2016. Ericsson Ventures, Accel and Redline Capital Management also participated in the round. Spectro Cloud received a \$7.5 million investment on March 17, 2020 to solve the problem of rolling out Kubernetes services on a managed platform without being beholden to any large vendor.</p>

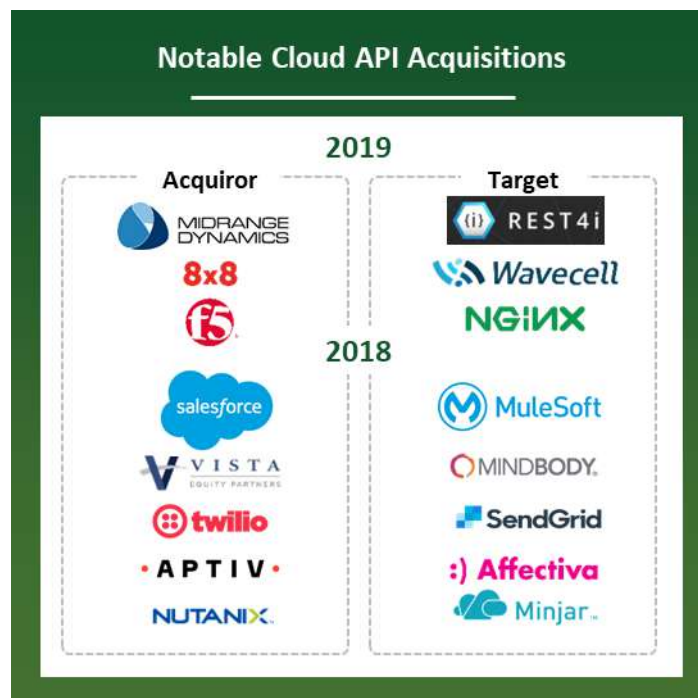


### 3.5 APIs Have Become the Dominant Information Sharing Paradigm

APIs are the modern connectivity paradigm of cloud computing. The cloud cannot operate without APIs: customers depend on APIs to connect data to the cloud, and APIs speed up the process to help customers make fast, smart decisions. They unify cloud infrastructure, allowing customers to run more efficient operations and programs. APIs unlock the cloud's potential to be an IaaS, PaaS, and SaaS offering; they can even integrate hybrid and multi-cloud strategies. APIs have become the de facto data connectivity standard as we journey forward in the IoT and serverless computing eras.

We segment the global API market into two segments:

- First, API Platforms which includes iPaaS and while estimates vary widely all expect the market to grow to a multi-billion level by the early 2020's.
- Secondly, is the broader market of services which are offered through an API model (the most famous being Twilio) to developers and other end-markets directly. This second market while difficult to estimate is clearly significantly larger given that almost every company today utilizes APIs for their data connectivity and offering information over the web. Therefore, cloud providers with the most efficient and extensive APIs will gain an edge and win over customers.



APIs used to be overlooked by cloud providers but are recently and increasingly becoming more critical to competing in the cloud wars. Salesforce's \$6.5B acquisition of MuleSoft in May 2018 epitomizes this strategic shift. This blockbuster acquisition will create Salesforce's Integration Cloud, a competitive response to Azure, AWS, GCP and Oracle. The idea is to cut off Salesforce customers' dependency on outside vendors for platform needs. Leveraging MuleSoft's Any-point Platform, Salesforce customers will be able to connect legacy and on-premise systems and devices to the cloud, facilitating and accelerating smarter decision-making. With the MuleSoft acquisition, Salesforce can evolve from a cloud SaaS provider to a more competitive cloud SaaS/PaaS as well as penetrate into new SaaS application verticals outside of their current Sales & Marketing category dominance.

#### API Management Companies



**DreamFactory** offers an open source software that provides REST APIs for mobile, web and IoT applications. In December 2014, it raised \$4MM – total capital raised is estimated at \$18.5MM. New Enterprise Associates is among its investors.

## Top M&amp;A Trends in Infrastructure Software

	<p><b>Kong (FKA Mashape)</b> bills itself as a “Next-Generation API Platform for Multi-Cloud and Hybrid Organizations” with offerings that include an open source API gateway; a developer portal for API distribution and developer onboarding; and API analytics to monitor and measure performance and execution. The vendor has raised a total of \$71MM over five rounds. Its latest round was a \$43MM series C in March 2019, led by Index Ventures (UK). Charles River Ventures, Lombardstreet.io Ventures, Andreessen Horowitz, WiL (World Innovation Lab), and GGV Capital also participated in the round.</p>
	<p><b>Nevatech</b> provides its Sentinet APIM platform composed of an API catalog/repository, an API gateway and an internal developer portal. The Sentinet Administrative Console includes capabilities for registering, describing and virtualizing REST APIs, as well as REST-to-SOAP conversions. The company is private and self-funded.</p>
	<p><b>Postman</b> offers its Postman Chrome and Postman Mac applications. Both are API documentation and testing tools that can be downloaded and added to Chrome and Mac OS. The apps enable developers to run, test, document and share API requests. In June 2019, the firm raised a \$50MM series B round led by Charles River Ventures, putting the Company’s pre-money valuation at \$315MM.</p>
	<p><b>SmartBear Software</b> acquired the Swagger API open source project from Reverb Technologies in Q1 2015. The deal positioned the company among the two most widely adopted API initiatives – SoapUI and Swagger. In late 2015, SmartBear donated Swagger to the Open API Initiative under the Linux Foundation. Its SwaggerHub APIM offering brings together all of the Swagger tooling into a collaborative web application to manage API definitions throughout the API lifecycle. In May 2017, SmartBear was acquired by private equity (PE) firm Francisco Partners for an estimated \$490MM, according to 451 Research's M&amp;A KnowledgeBase.</p>
	<p><b>Tyk</b> is a commercialized offering of the Tyk open source API gateway. Which is a platform designed to enable interconnectivity between systems and devices. The company's platform is fast and scalable, contains an API gateway, analytics, developer portal and dashboard and is available install on premises, as a cloud service, or hybrid, enabling users to build cutting edge web platforms and create value across the retail, finance, telecoms, healthcare, media, and public sectors.</p>
	<p><b>WSO2</b> has developed open source APIM software capable of designing and publishing APIs; creating and managing a developer community; and securing and routing API traffic. The vendor leverages its Carbon SOA platform to secure, integrate and manage APIs. It also integrates with the WSO2 analytics platform, providing reports, alerts and insight into API behavior. In August 2015, WSO2 raised \$20MM in funding led by Pacific Controls, with participation from Toba Capital. In April 2013, it raised \$5MM from Toba Capital and in February 2013, it raised \$10MM from Toba Capital, Cisco and Intel Capital.</p>
	<p><b>Zapier</b> has developed an online platform designed to link web-based applications. The company's online platform connects and automates the applications and synchronizes data between web applications. The company raised \$1.36 million of</p>

	venture funding from Salesforce Ventures and other undisclosed investors on November 25, 2014.
	<b>Metabase</b> offers an open source analytics and business intelligence platform designed to measure, analyze, and share data. Professional services include managed hosting, assistance with implementing custom analytics, and enabling businesses to observe data over time and see trends. The company raised \$8 million of Series A venture funding in a deal led by New Enterprise Associates on April 24, 2019.
	<b>Tray.io</b> provides a general automation platform designed to help build and maintain enterprise-wide integrations. The company raised \$50 million of Series C venture funding in a deal led by Meritech Capital Partners on October 3, 2019, putting the company's pre-money valuation at \$440 million. True Ventures, G&H Partners, GGV Capital and Spark Capital also participated in the round.
	<b>Cloudability</b> has developed a financial management tool and FinOps platform. The company's platform aggregates expenditures into accessible and comprehensive reports that identify and allocate cloud costs. The company was acquired by Apptio, via its financial sponsor Vista Equity Partners, through an LBO on May 31, 2019.
	<b>Tonkean</b> is the developer of an adaptive business operations platform designed to connect existing systems and projects and tailor experiences for each person. The company's platform automatically connects to the interfaces users already use such as forms, email, chat, or other tools, based on the needs and preferences of each individual, enabling operations teams to quickly create adaptive modules to solve their unique challenges in a way that doesn't require new systems or engineering work.

### 3.6 DevOps is the Answer to Increasing Competition From Emerging Digital Disruptors.

As the competitive battleground moves towards using technology to accelerate the competitive cycle, what some call “Software Eating the World” or “Every Company Is a Software Company”, enterprises have come to realize that they need to dramatically accelerate their development lifecycles. Competition has dramatically increased thanks to startups leveraging modern technologies and faster innovation cycles to parse apart existing companies’ business models, more efficient architectures enabled by cloud computing and APIs and innovation methodologies (lean, MVP, agile/scrum) that accelerate startups’ ability to be competitive. Traditional market leaders are finding their legacy profit pools being attacked quickly and are seeking answers which will accelerate their ability respond, defend and find new areas of growth.

The initial response was to invest in mobile applications in mid-00’s which led them into modern architectures and development methodologies. Since then they have adopted DevOps as a central organizing principle for most new development (and more broadly, innovation) efforts. However, this shift requires a new set of tools and platforms which is driving the DevOps startup investment and business growth. DevOps is now considered a critical part of any Enterprises’ Digital Transformation initiatives.

From an M&A perspective, DevOps acquisitions have been numerous and overlap with other segments (Public/Hybrid Cloud, Security – DevSecOps, Containers, Cloud Management) as DevOps necessarily involves most of these other segments in its adoption. It is simply about creating new value generating applications using modern platforms on an accelerated basis.

Notable DevOps acquisitions:

- Microsoft acquired GitHub.
- Google acquires DORA (DevOps Research and Assessment).
- Cognizant acquires Contino, an enterprise DevOps and cloud transformation consultancy.
- NTT Data acquires Flux7.
- JFrog acquires emerging cloud-based CI/CD startup Shippable.
- Cloudbees acquired legacy enterprise Application Release Automation private company ElectricCloud.






Enterprise customers represent a lucrative market, but cloud providers also know that they have to target a critical set of cloud adopters: developers. Developers are the key constituency dictating which cloud infrastructure is being consumed and how. In a competitive battle, cloud providers need to identify ways to attract and retain customers to its platform. The cloud offers an ideal environment for developers to build, test, and collaborate on apps. Enterprise customers may utilize the cloud, but developers are creating and expanding the cloud.

## Top M&A Trends in Infrastructure Software

Amazon made the first move in an effort to lure developers when it acquired Cloud9 in 2016. Microsoft, however, had an even more daring response: it spent \$7.5B to purchase development platform GitHub in June 2018. GitHub will operate independently, but it will be folded into the Azure line of business. What does this get Microsoft? More than 28M users will be immediately available to retain, absorb, or convert from competing platforms like AWS or GCP. Microsoft clearly viewed this as a strategic priority in their goal to being a leading cloud infrastructure provider. We note that \$7.5B for the acquisition came out of its \$30B reserves to repurchase stock.

### DevOps Companies:

 ROOKOUT	<p><b>Rookout</b> is the developer of rapid production debugging platform designed to help developers to track down issues in production code without any additional coding to write. The company's platform collects data on-demand from live code and pipelines it immediately to any destination through alerting and monitoring tools, enabling developers to tackle bugs and issues without any need for coding, re-deploying or restarting the application.</p>
 SMARTBEAR	<p><b>SmartBear</b> is the developer of enterprise-class software development and testing tools designed to deliver the highest quality and best performing software possible. The company's software uses code review, application programming interface (API) and UI level testing and monitoring across mobile, web and desktop applications enabling enterprises to automate mundane tasks, easily track and report the success of testing efforts, and build the best-performing products possible.</p>
 BOS	<p><b>BOS</b> is the developer of an agnostic software framework designed to assist developers to focus on fulfilling business requirements. The company's framework facilitates the launching of software products by providing the core infrastructure components and common functionality in a framework-as-a-service model, enabling businesses to launch a first viable product that is flexible, secure and scalable in less time.</p>



### 3.7 Serverless

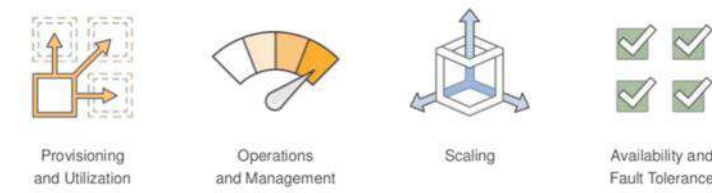
It cannot be understated how much serverless will impact the way that cloud is consumed and the amount of cloud that is consumed going forward.

Serverless changes 3 main fundamental aspects of the cloud:

- It removes the need to employ operations resources in your company to run cloud applications.
- Related to #1, serverless provisions, scales and manages utilization & availability for your applications running in the cloud.
- You pay exactly for only the number of resources you use in the cloud when a user uses your application.

#### What is Serverless?

Removes the need for....



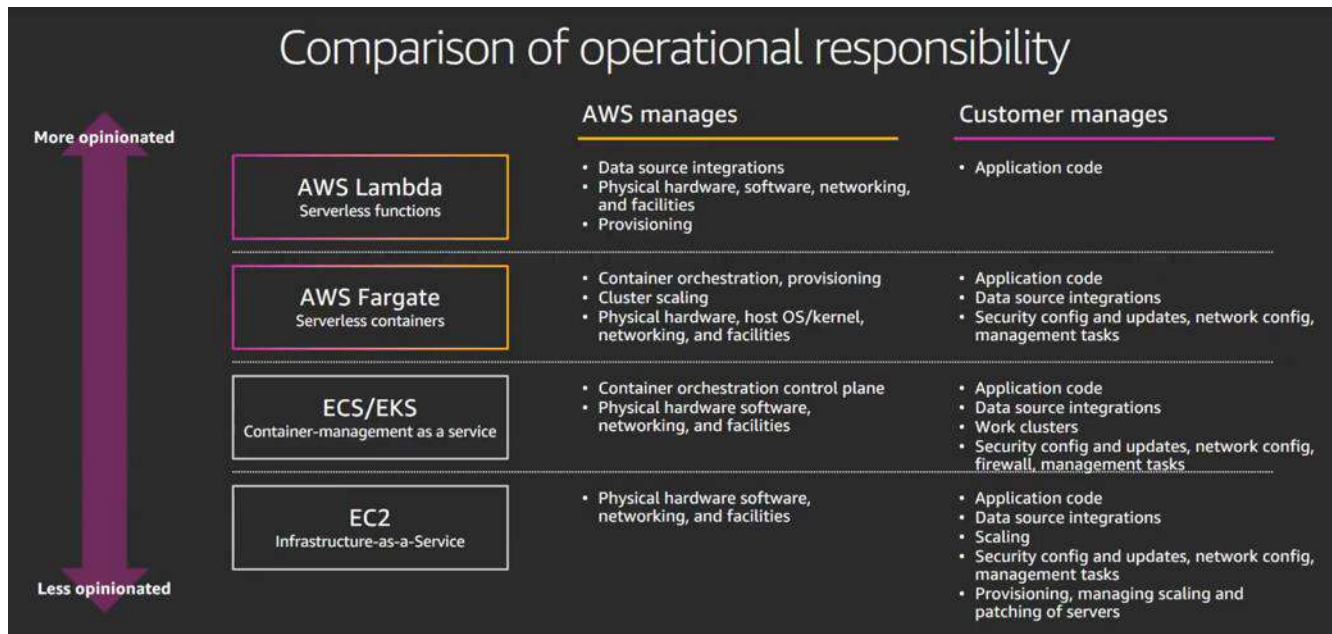
You may have heard or will hear a note of caution targeted at serverless, that being that currently serverless capabilities are limited to short duration operations. So, it would not be possible to take MSFT Word from the Office 365 package and have that run on serverless.

However, serverless is such a compelling model that applications will be designed and developed going forward to work with serverless, rather than serverless being developed to work with the way we currently develop applications. And we are already on this journey with containers and cloud hosted common applications driving the need for applications to be made up of smaller components that can be given different treatment including running in different locations.





Serverless is a boon for developers of all kinds. Up until now having knowledge of AWS, Azure or GCP capabilities was a key requirement of a cloud application developer, and these resources were in high demand. Going forward, this level of detail will be obfuscated by serverless. With the serverless interface in cloud becoming the interface developers interact with and not the lower level interfaces.

As an illustration of the reduction in complexity a developer can expect take a look at the below diagram, which is AWS' own slide showing the reduction in complexity versus other ways to use AWS.





## List of Serverless Companies:



	<p><b>AWS Lambda</b> is a provider of a cloud-based web platform offering information technology infrastructure services. The company's services are offered via a scalable computing platform in the cloud including cloud computing, compute, networking, storage and content delivery, databases, analytics, application services, deployment and management, mobile services, investments enabling e-commerce startups to build and grow their cloud business.</p>
	<p><b>Microsoft Azure Functions</b> offers a public cloud computing platform. Its solutions include IaaS, PaaS, and SaaS that can be used for analytics, virtual computing, storage, and networking services.</p>
	<p><b>Nuweba</b> has developed a fast and secure server-less platform designed to offer advanced application security and deep visibility services. The company's platform aims to overcome the speed, security, and visibility challenge facing server-less technology. Nuweba added GPUs, claiming it can run ML models 100x faster than AWS offerings, to its serverless platform on November 19. The company raised \$10.2 million of seed funding in a deal led by Magma Venture Partners, Target Global and Blumberg Capital on January 28, 2020.</p>
	<p><b>New Relic</b> is a provider of software analytics solutions for organizations to collect, store, and analyze massive amounts of software data in real-time. The firm's flagship New Relic Software Analytics Cloud is made up of a suite of products, a Big Data database, and an open platform. Slow Ventures sold a stake in the company (NYS:NEWR) for an undisclosed amount. New Relic (NYS:NEWR) acquired IOPipe for \$5.1 million on October 31, 2019.</p>

## Top M&amp;A Trends in Infrastructure Software






	<p><b>Zoho Catalyst</b> provides an online business, network and IT infrastructure management application designed to offer software maintenance and solve business problems. The company's application enables purchasing organizations and suppliers across all segments of the hospitality industry to streamline the entire procurement lifecycle. Zoho launches Catalyst, a new developer platform with a focus on microservices on October 16, 2019. Dell Ventures sold its stake in the company on an undisclosed date.</p>
	<p><b>Red Hat Knative</b> offers services for its version of the open-source Linux software operating systems, middleware, storage, virtualization, and management tools. Red Hat' Knative is an orchestration platform for an orchestration platform, specifically for <a href="#">serverless applications</a> — things that would otherwise run on <a href="#">AWS Lambda</a>. The company was acquired by International Business Machines (NYS: IBM) for \$34 billion on July 9, 2019.</p>
	<p><b>Qubole</b> has developed a data management platform intended to make data-driven insights easily accessible to anyone. Qubole launches Quantum, its serverless database engine. The company received \$15 million of debt financing in the form of a growth capital loan from TriplePoint Venture Growth on December 27, 2019.</p>
	<p><b>Palo Alto Networks</b> is a cybersecurity vendor that sells security appliances, subscriptions, and support into enterprises, government entities, and service providers. Sequoia Capital sold its stake in the company (NYS: PANW) for an undisclosed amount on September 30, 2015. Palo Alto Networks acquires serverless security company PureSec for \$47 million on July 9, 2019.</p>
	<p><b>Overclock Labs</b> provides automation tools intended to help companies to manage cloud infrastructure. The company raised \$1.3 million of seed funding from Carthona Capital, Nautilus Ventures and Tuesday Capital on November 21, 2017 in the form of SAFE notes, putting the company's pre-money valuation at \$6.7 million. Hone Capital, CSC UpShot Ventures and Auren Hoffman also participated in the round.</p>
	<p><b>Hasura ZEIT</b> provides an application development platform designed to speed up and improve the process of a building applications. The company's platform features GraphQL engine to integrate Kubernetes clusters on different cloud vendors in a single command and port application from one cloud vendor to another. The company raised \$9.7 million of Series A venture funding in a deal led by Vertex Ventures US on February 26, 2020, putting the company's pre-money valuation at \$20 million. GREE Ventures, Nexus Venture Partners, SAP.iO Foundry, James Tamplin, Amod Malviya, Michael Stoppelman and Sam Lambert also participated in the round.</p>
	<p><b>Spot (formerly Spotinst)</b> has developed cloud-based infrastructure-as-a-service platform designed to improve performance, reduce complexity and lower compute infrastructure costs. The company reached a definitive</p>




## Top M&amp;A Trends in Infrastructure Software

	agreement to be acquired by NetApp (NAS: NTAP) for \$450 million on June 3, 2020.
	<b>HashiCorp</b> provides a cloud infrastructure automation platform designed to solve development, operations and security challenges in infrastructure. The company's platform provides consistent workflows to provision, secure, connect and run infrastructure. The company raised \$175 million of Series E venture funding in a deal led by Franklin Templeton Investments on March 9, 2020, putting the company's pre-money valuation at \$5.1 billion. Mayfield Fund, GGV Capital, True Ventures, Redpoint Ventures, IVP, Geodesic Capital, Cisco Systems and T. Rowe Price also participated in the round.
	<b>SLAppForge</b> offers a web-based integrated development environment (IDE) named <a href="#">Sigma</a> for authoring serverless applications, as well as a built-in <a href="#">monitoring platform</a> . The Sigma IDE combines support for editing function code with code completion and drag-and-drop functionality to add infrastructure resources to the underlying stack.
	<b>Stackery</b> provides software for enterprises to operationalize and govern their serverless applications. The company's platform connects and configures services using operational DevOps practices for an error-proof and painless deployment. It focuses on the infrastructure management area, allowing organizations to create and manage infrastructure stacks using a drag-and-drop UI editor. Stackery allows AWS Lambda developers to debug their serverless programs locally on a laptop. The company raised \$5.50 million of seed funding in a deal led by Steve Kishi on April 3, 2018, putting the company's pre-money valuation at \$11.5 million. Pipeline Capital Partners, Founders' Co-op and Voyager Capital also participated in the round.
	<b>Protego Labs</b> is a developer of security services designed to offer full life-cycle security to serverless applications. The web-based UI application surfaces security-focused visualizations, including the security posture explorer, third-party vulnerability reports, and policy manager. The company was acquired by Check Point Software Technologies (NAS: CHKP) for \$40 million on December 2, 2019.
	<b>IOPipe</b> offers an open-source module designed to monitor server-less applications. The company's platform is built for server-less computing that provides real-time telemetry, tracing, profiling, alerts, logs and errors across all their functions. The company was acquired by New Relic (NYS: NEWR) for \$5.1 million on October 31, 2019.
	<b>Epsagon</b> is a developer of AI-powered automated performance monitoring platform designed to offer complete monitoring for serverless applications. The company's platform predicts performance issues before they occur and offers full support for cloud resources and external APIs. Epsagon delivers its own distributed tracing capability for serverless architectures, providing an AWS X-Ray alternative. The product offers auto-discovery of cloud resources and external APIs, as well as AI-supported root-cause analysis for easy

	troubleshooting. The company raised \$16 million of Series A venture funding in a deal led by US Venture Partners on January 16, 2020. StageOne Ventures, Cerca Partners and Lightspeed Venture Partners also participated in the round.
	<b>DashBird</b> provides a monitoring and intelligence platform. The company's platform is designed to give organizations the confidence to build and operate complex serverless applications. It offers failure detection, analytics, and visibility for AWS Lambda-based solutions. The product integrates with <a href="#">AWS CloudWatch</a> and <a href="#">AWS X-Ray</a> to obtain logs, metrics, and traces. And it presents account-, service-, and function-level data on dashboards specifically crafted for serverless architectures. The company raised EUR 1.9 million of seed funding in a deal led by Paladin Capital Group on April 15, 2020. Icebreaker VC, Passion Capital and Lemonade Stand (vc) also participated in the round.
	<b>Rookout</b> provides a rapid production debugging platform designed to help developers track down issues in production code without any additional coding to write. The company raised \$8 million of Series A venture funding in a deal led by Cisco Investments on August 7, 2019. TLV Partners, Emerge, Nat Friedman, John Kodumal and Raymond Colletti also participated in the round.

## Open Source Serverless Companies:

	<b>Apache OpenWhisk</b> is a serverless, open source cloud platform that allows you to execute code in response to events at any scale. It's written in the Scala language. The framework processes the inputs from triggers like HTTP requests and later fires a snippet of code on either JavaScript or Swift.
	<b>Fission</b> is a serverless computing framework that enables developers to build functions using Kubernetes. It allows coders to write short-lived functions in any programming language and map them with any event triggers, such as HTTP requests.
	<b>Iron.io</b> (acquired by Xenon Ventures) is a serverless computing framework that offers a cohesive microservices platform by integrating its existing services and embracing Docker. Developers write the functions in Go language.
	<b>Fn Project</b> is an open source container-native serverless platform that you can run anywhere — on any cloud or on-premise. It's easy to use, supports every programming language, and is extensible and performant.
	<b>OpenLambda</b> is an Apache-licensed serverless computing project, written in Go and based on Linux containers. The primary goal of OpenLambda is to enable exploration of new approaches to serverless computing.

 Kubeless	<p><b>Kubeless</b> is a Kubernetes-native serverless framework that lets you deploy small bits of code without having to worry about the underlying infrastructure. It leverages Kubernetes resources to provide autoscaling, API routing, monitoring, troubleshooting, and more.</p>
 OPENFAAS	<p><b>OpenFaaS</b> is a framework for building serverless functions with Docker and Kubernetes that offers first-class support for metrics. Any process can be packaged as a function, enabling you to consume a range of web events without repetitive boilerplate coding.</p>
 epsagon	<p><b>Epsagon</b> provides AI-powered automated performance monitoring platform designed to offer complete monitoring for serverless applications. The company's platform predicts performance issues before they occur and offers full support for cloud resources and external APIs, automatic discovery of asynchronous data flows across the entire architectures, from end to end.</p>






### 3.8 Zero Code

This is not a new market, the average company in Zero Code has been around for 7 years, what has happened is that the market has moved to make Zero Code exponentially more relevant. Zero Code is at its essence a simple way to connect pieces of code, components, so they create an application. This can be something as straightforward as a simple form that is displayed on a cell phone and then talks to a set of information resources in the cloud. Some of these cloud resources provide information for the form, some of them are targets for the information (such as a database) some of them process a package of data and returns a result (credit card processing, address look up).

In the past, two things did not exist or at least could not be completed very easy: linking to external services; and turning the finished code into a scalable application. Recent developments in cloud (cloud-based components accessible via APIs and serverless or “cloud as a Service”) enabled both of these and now makes Zero Code one of the hottest categories in cloud.

Even Salesforce’s recent acquisition of Vlocity was partly driven by the opportunity to acquire a Zero Code capability versus building it themselves.

#### List of Zero Code Companies:

	<p><b>AWS Lambda</b> is a provider of a cloud-based web platform offering information technology infrastructure services. The company's services are offered via a scalable computing platform in the cloud including cloud computing, compute, networking, storage and content delivery, databases, analytics, application services, deployment and management, mobile services, investments enabling e-commerce startups to build and grow their cloud business.</p>
	<p><b>Zentera</b> provides hybrid cloud infrastructure platform as an overlay network plane across multiple private and cloud domains that connects dispersed public, private and managed hosted network domains. The company raised \$5MM of venture funding from an undisclosed investor on June 12, 2018.</p>
	<p><b>K2</b> provides business process management software. The company's platform offers applications to automate and manage business processes, such as document approval or inventory tracking, as well as people, services, information and systems into a single application enabling its users to create customized business applications. The company completed an undisclosed amount of debt refinancing round on June 26, 2019. PNC Bank provided term loan and revolving line of credit in support of the transaction.</p>
	<p><b>Bizagi</b> provides business process management software designed to help organizations to transform into digital businesses. The company's enterprise software for digital transformation connects people, applications, devices and information and offers a complete BPM life-cycle from process automation to workflow automation and deployment services to customers. The company received \$47 million of development capital from The Invus Group on August 11,</p>





	2017. The company will use the new capital to accelerate growth across focus markets - the US and Europe.
	<b>Workato</b> provides an integration platform designed to automate businesses. The company offers a cloud-native, consumer-scale platform that can handle app, data, API, integrations and process automation, enabling IT and business users (like App Admins, Business Analysts, Biz Ops) to build integrations and automation while providing the tools to IT to manage and govern them. The company raised \$70 million of Series C venture funding in a deal led by Redpoint Ventures on November 7, 2019, putting the company's pre-money valuation at \$430 million.
	<b>Vlocity</b> provides a cloud-based software intended to deliver industry-specific customer experiences. The company's software provides cloud applications that help companies to deliver unified, industry-specific customer experiences in customer-centric industries, including communications and media, health insurance and the public sector, enabling clients to achieve faster business agility and time to value from the cloud across digital and traditional channels. The company was acquired by Salesforce (NYS: CRM) for \$1.33 billion on March 6, 2020
	<b>Optic</b> provides an online platform designed to automate routine programming. The company's portal can understand the code, generate code and auto-update which can be configured to write and maintain any of the routine codes, enabling developers with an open source to save time. The company graduated Y Combinator's Summer 2018 program on August 21, 2018 and received \$120,000 in funding
	<b>Tray.io</b> provides a general automation platform designed to help build and maintain enterprise-wide integrations. The company's platform allows citizen automators throughout organizations to automate complex processes through a platform and can connect their entire cloud stack using APIs, enabling developers and IT professionals to use the company's products as a centralized platform without devoting extensive engineering resources to the projects. The company raised \$50 million of Series C venture funding in a deal led by Meritech Capital Partners on October 3, 2019, putting the company's pre-money valuation at \$440 million.
	<b>Bryter</b> provides no-code automation platform designed to automate expert knowledge. The company's cloud-based platform enables professionals to build, manage and sell interactive applications, without the need for programming or coding skills, enabling businesses to digitize and scale their services. The company raises \$16M for a no-code platform for non-technical people to build enterprise automation apps on June 4, 2020.
	<b>Codota</b> provides a code search engine designed to help in finding code examples. The company's software provides insights learned from all the codes and analyzes code snippets from sites to select clear code examples, thereby enabling businesses

## Top M&amp;A Trends in Infrastructure Software

	to create faster software. The company raised \$12M for an AI platform that auto-completes developers' code on April 27, 2020.
	<b>Tonkean</b> provides an adaptive business operations platform designed to connect existing systems and projects and tailor experiences for each person. The company's platform automatically connects to the interfaces users already use such as forms, email, chat, or other tools, based on the needs and preferences of each individual. The company raised \$24 million of Series A venture funding in a deal led by Lightspeed Venture Partners on April 8, 2020.
	<b>Unqork</b> provides an enterprise application platform created for enterprise insurance and financial services. The company's platform allows users to build, deploy, and manage complex applications without writing a single line of code and streamlines product sales process to improve customer experience, enabling large companies to build complex custom software faster with higher quality, and lower costs than conventional approaches. On February 26, 2020, the company raised \$51 million in additional funding, in addition to its Series B round announced in November, to further build out its application platform.
	<b>Mendix</b> provides an application-development platform designed to create and continuously improve mobile and web applications at scale. The company's application-development platform allows users to develop, deploy and manage mobile and web applications faster and easier, enabling companies to get faster and better results, effectively driving ROI in days, not months. The company was acquired by Siemens (ETR: SIE) for EUR 515 million on October 1, 2018.
	<b>OutSystems</b> provides application development and delivery platform designed to seamlessly integrate custom code. The company's application development platform is used to develop, deploy, manage and change web applications that are robust, ready to scale and based on standard technology, ensuring no vendor lock-in while enabling enterprises to manage apps faster. The company received \$360 million of development capital from Kohlberg Kravis Roberts and Goldman Sachs Private Capital Investing Group on May 6, 2018.
	<b>Aptean</b> provides enterprise resource planning software. The company offers industry-specific software applications that enhance processes across the enterprise, helping businesses manage their resources, supply chain, employees, and customer relationships delivering services to manufacturing, distribution, high tech, transportation, retail, government, real estate, financial services, health care and not-for-profit industries. The company received an undisclosed amount of debt financing in the form of a first lien and a second lien from Golub Capital and Macquarie Group on August 22, 2019.

	<p><b>Agilepoint</b> provides a business process management platform. The company offers a platform for developing and managing business and allows businesses to implement cross-functional and cross-organizational businesses processes in the form of process-based applications.</p>
	<p><b>Caspio</b> provides a cloud database and platform-as-a-service technology designed to help businesses create forms, searchable databases, interactive reports and sophisticated multi-user business applications. The company's low-code application platform includes a built-in online database, rapid application development tools and scalable cloud infrastructure, enabling tech-savvy business users to shrink development time and money of web and mobile applications, forms, reports and widgets. The company joined Santa Fe College Business Incubation Programs on an undisclosed date.</p>
	<p><b>MicroPact</b> provides web-based, commercial off the shelf (COTS) software for US Government agencies and Fortune 500 corporations. The company offers commercial off-the-shelf (COTS) applications including entellitrak, a low-code application development platform for case management and business process management, whether based on premises or in the cloud, its Data-First approach allows entellitrak to be implemented immediately and configured continuously, enabling clients to get to work quickly while keeping costs low. The company was acquired by Tyler Technologies (NYS: TYL) for approximately \$202.2 million on February 28, 2019.</p>
	<p><b>Ninety One</b> provides remote monitoring software designed to enable cardiac devices monitoring outside of conventional clinical settings, which may increase access to care and decrease healthcare delivery costs. The company's automated monitoring platform leverages advanced machine learning tools for analysis and optimization for remote monitoring across devices and models with high availability, elasticity, and modern UI/UX design, enabling healthcare industry to predict events and prioritize response based on critical level.</p>
	<p><b>MatsSoft</b> provides a low-code software platform designed to close the process execution gap. The company's low-code software platform rapidly delivers enterprise-grade business applications with a minimum of hard coding and upfront investments, enabling business organizations to improve the business process management. The company was acquired by Netcall (LSE: NET) for GBP 14.04 million on August 4, 2017.</p>
	<p><b>MIOsoft</b> provides database software designed to provide clear, complete, and correct data. The company's solutions include big data analytics, data governance, data integration, data migration and data management, helping customers to discover, improve and deliver their data more quickly and easily.</p>
	<p><b>QuickBase</b> provides a low-code application development platform. The company's cloud-based platform enabling non-technical developers to build, customize and connect scalable, secure cloud applications mapped to unique business challenges without compromising IT governance and control thus</p>

	addresses a broad set of business use cases through its customizable application platform that includes workflow and process automation, forms, and personalized charts and reports driven by customizable business logic. The company received \$12.99 million of debt financing in the form of a second lien from Business Development Corporation of America and Blackrock Capital Investment on December 31, 2019.
	<b>Fission.Codes</b> develops tools intended to develop next-generation hostless apps. The company's tools standardize status codes for more secure, re-usable, and inter-operable smart contracts for Web3, enabling the development community to improve their own experience and in turn enabling better user experiences.
	<b>OutSystems</b> provides application development and a delivery platform designed to seamlessly integrate custom code. The company's application development platform is used to develop, deploy, manage and change web applications that are robust, ready to scale and based on standard technology, ensuring no vendor lock-in while enabling enterprises to manage apps faster.

### 3.9 Hybrid, Multi and Edge Clouds

#### The Demand for Multi-Clouds

Customers are starting to demand “best of breed” solution sets across their cloud providers. Typically, people think of the Big Three when speaking about Public Cloud – AWS, Azure and Google. Whether they decide to deploy a production server at AWS, DevOps through Azure, or maintain a workload in a private cloud solution hosted with a third-party provider like Rackspace, all of these servers need to be maintained through a single lens.



While it is doubtful that the term “polynimbus” will ever catch on, clearly, IT is moving to a multi-cloud world. Although the cloud giants aim for complete domination, they are also realists. As the number of cloud offerings increases, so will the likelihood of companies implementing a hybrid and/or multi-cloud solution. Indeed, 69% of 451 Research respondents polled, planned on having a hybrid and/or multi-cloud system in place by 2019. Thus, large acquirers will be looking for companies that offer efficient systems to serve hybrid and multi-cloud customers. They understand that customers will opt for hybrid and/or multi-cloud solutions in order to best run their business.

In our view, there are three primary drivers for the enterprise to pursue a Hybrid Cloud strategy:

- **Avoid lock-in:** Retaining some portion of the compute on-prem allows for customers to control costs and avoid cloud “lock-in” dependence upon a single provider. Enterprise IT leaders are increasingly concerned about their effective options if a particular cloud provider becomes problematic.
- **Leveraging historic investments in datacenters:** As much as Silicon Valley demands movement towards a newer, better way of doing things, the historical investments that enterprises put into modernizing and building datacenters is a strong center of gravity for how companies view their computing future.
- **Compliance and Security:** While much progress has been made in getting Enterprises comfortable with security, it’s clear that this still stands as an obstacle for some workloads migrating to the cloud, especially in highly regulated firms.

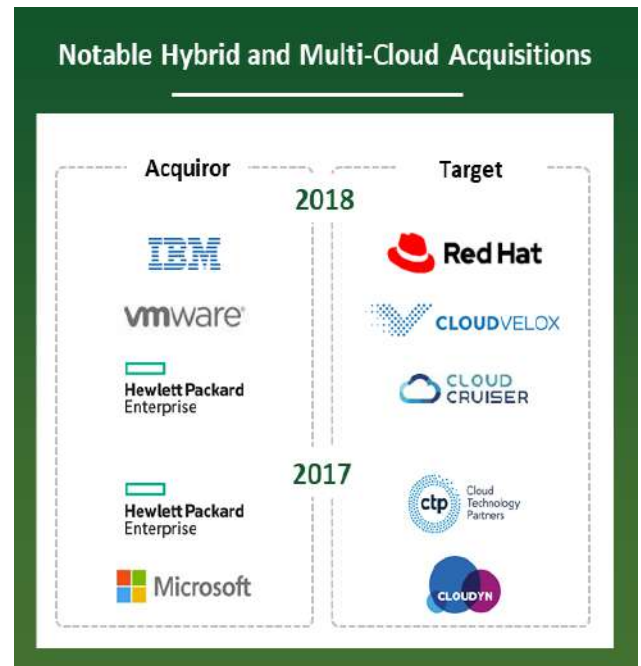
## Top M&A Trends in Infrastructure Software

The move towards hybrid and multi-cloud solutions creates a headache for customers, but it presents an opportunity for cloud providers. IBM's blockbuster acquisition of Red Hat for \$34 billion was a clear statement of the need to transform to a cloud first business. Red Hat brings significant cloud infrastructure exposure as well as PaaS capabilities with OpenShift. In fact, many analysts predict significant competitive tensions between Red Hat and VMWare given their focus on providing Kubernetes capabilities to the enterprise. IBM made an earlier attempt at cloud relevance with their acquisition of Softlayer in 2013 for a little over \$2 billion but it did not help move the needle in terms of public cloud competitiveness, necessitating the following Red Hat move.

Also, not to be left out, Microsoft acquired Avere Systems in January 2018. The move served two purposes:







- To differentiate and unify its hybrid cloud capabilities (AWS and Google partner for hybrid solutions);
- Extend its hybrid solution offerings beyond storage to include monitoring, networking, and security.

Nutanix also clearly recognized the potential customer headache of operating multiple clouds. In order to gain a competitive advantage, the company acquired Netsil for \$70MM in March 2018. Best known for its offering Botmetric, Netsil helped Nutanix gain favor with enterprise customers with enhanced cost monitoring, security, and compliance capabilities.








## Multi-Cloud Companies:

	<p><b>Alkira</b> provides a cloud services exchange intended to unify multi-cloud network with integrated network services. The company's portal offers an intuitive design canvas with simplified graphic modeling of the network, including network services, network segmentation, and visualization of the intent-based policy applied across multi-cloud networks. The company raised \$30 million of Series A venture funding from GV, Kleiner Perkins and Sequoia Capital on June 1, 2018, putting the company's pre-money valuation at \$27.5 million.</p>
	<p><b>Ori</b> provides an intelligent cloud platform designed to enable computing anywhere and everywhere. The company's platform helps to control, automate and make provision to distributed computing resources over multiple infrastructures to network virtualization layers, enabling developers to build future applications. The company raised GBP 6.3 million of seed funding in a deal led by Episode 1 Ventures on March 4, 2020, putting the company's pre-money valuation at GBP 5.2 million.</p>
	<p><b>Rafay Systems</b> provides turnkey SaaS platform designed to automates ongoing operations and lifecycle management for containerized applications. The company's platform governs, monitors and manages clusters as well as feature cluster blueprinting and enterprise-ready integration tools, enabling developers and operations teams to focus on building applications instead of writing and maintaining complex infrastructure code. The company raised \$8 million of Series A venture funding in a deal led by Ridge Ventures on June 4, 2019, putting the company's pre-money valuation at \$26 million.</p>
	<p><b>Volterra</b> provides an edge computing platform designed to solve problems that require low-latency computing. The company's platform helps to deploy, connect, secure and operate applications and data across multi-cloud and edge sites, enabling businesses to manage applications in hybrid environments. The company raised \$25 million through the combination of Series B and Series B-1 venture funding from M12, ITOCHU Technology Ventures and Samsung NEXT Ventures on November 7, 2019, putting the company's pre-money valuation at \$150 million.</p>
	<p><b>Splice Machine</b> provides a managed open source package of data processing capabilities that can be deployed anywhere multi-cloud is deployed due to their container based deployment mode on top of a Kubernetes layer.</p> <p>Splice Machine's package of data processing uniquely unifies streaming, analytics, and transactions in a single relational database system enabling their customers to remove latency, cost, and complexity from supporting modern big data applications. Splice Machine supports ANSI SQL enabling their customers to leverage skilled resources used to using Oracle, Teradata and Netezza systems.</p>
	<p><b>Zentera Systems</b> developed a hybrid cloud infrastructure platform designed to address the security and networking issues of the multi-cloud market. The company's platform offers enterprise-grade networking and security for the emerging cloud ecosystem, protecting the new attack surface exposed by remote</p>

## Top M&amp;A Trends in Infrastructure Software

	cloud endpoints and creates a unified overlay network plane across multiple private and cloud domains that connect dispersed computers, virtual machines and containers, enabling companies to extend production datacenter operations to the public, private and managed hosted network domains.
	<b>Akash Network</b> develops a cloud computing platform designed to deploy, secure and scale applications. The company's platform opens and secures protocols to power the next generation of Cloud infrastructure, simplifies code deployment, manages workloads and provides a federated control plane, enabling enterprises, SaaS companies and software innovators to seamlessly deploy applications between multiple Cloud providers and reduce costs.
	<b>SCALR</b> provides a cloud management platform designed to automate and standardize application deployments across multi-cloud environments. The company's cloud management platform utilizes a hierarchical, top-down approach to policy enforcement, enabling administrators to find the balance between the needs of finance, security, IT and development teams. The company raised \$7.35MM of Series A venture funding in a deal led by OpenView Venture Partners on January 6, 2016, putting the company's pre-money valuation at \$19.5MM. Directors and board observers include: Mackey Craven (OpenView Venture Partners), Jim Baum (OpenView Venture Partners), John True (Cultivation Capital) (Cultivation Capital)
	<b>Alkira</b> is a provider of a cloud services exchange intended to unify multi-cloud network with integrated network services. The company's portal offers an intuitive design canvas with simplified graphic modeling of the network, including network services, network segmentation, and visualization of the intent-based policy applied across multi-cloud networks, enabling cloud architects and network engineers to build and deploy a point and click multi-cloud network in minutes, with the flexibility to turn services on and off as the business requires, with no upfront CapEx.
	<b>AVI Networks</b> develops an application delivery platform designed to deliver multi-cloud application services. The company's software features per-app load balancing, predictive auto scaling, application insights, security, full lifecycle automation and pervasive analytics across data centers and clouds, enabling enterprises to roll out applications faster, view actionable analytics and save costs.
	<b>Aviatrix</b> provides a multi-cloud native networking software designed to simplify connectivity to the cloud in a secure and scalable way. The company's software reduces the time to set up new virtual private networks and provides load balanced technology, enabling enterprises to realize the benefits of agility, flexibility, and simplicity when migrating applications to the cloud.

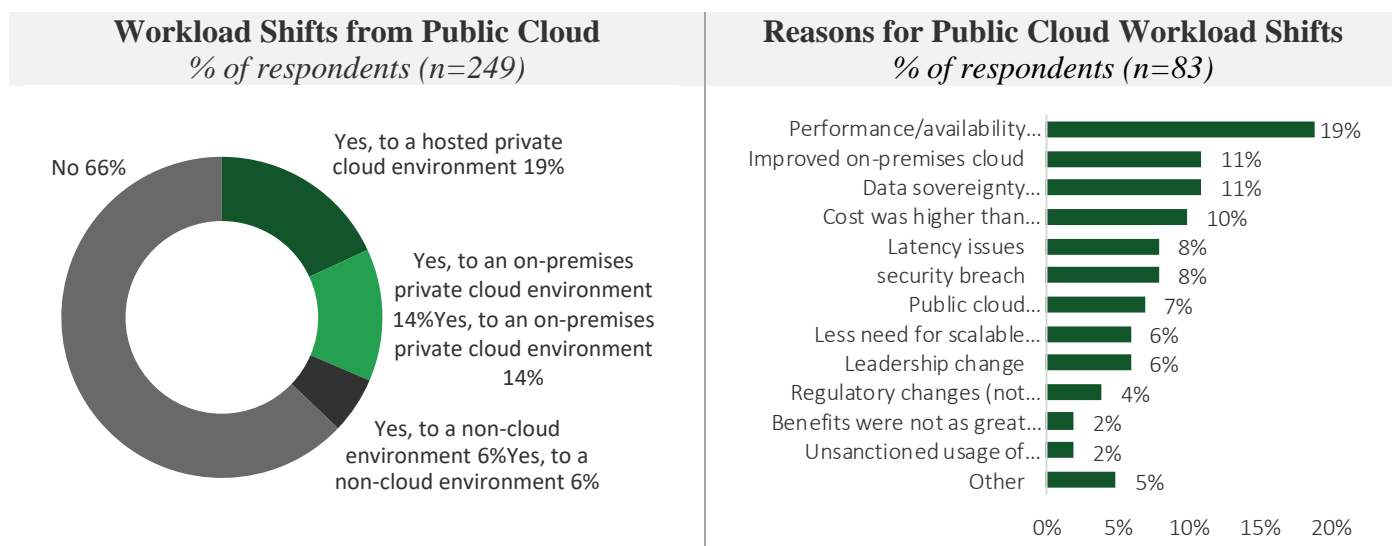
 HashiCorp	<p><b>HashiCorp</b> provides a cloud infrastructure automation platform designed to solve development, operations and security challenges in infrastructure. The company's platform provides consistent workflows to provision, secure, connect and run infrastructure for any application so as to help enterprises address the realities of multi-cloud, enabling organizations to adopt workflows to provision, secure, connect, and run any infrastructure for any application.</p>
 HYPERGRID	<p><b>Hypergrid</b> is a developer of an intelligent cloud management platform intended to solve the problem of managing hybrid and multi-cloud environments. The company's platform eliminates the guesswork to streamline cloud planning and reduces costs with predictive insights and recommendations, enabling clients to keep apps and data safe and employ quality practices at scale.</p>
 Agile Stacks	<p><b>Agile Stacks</b> is a provider of automated cloud development and deployment services intended to reinvent how enterprises implement clouds. The company's automated cloud development and deployment services select, assemble and deploy stacks in the cloud for less than a tenth of the time and with lesser risk as well as automates everything like updates, security patches, vulnerability scanning, backups, restores, and continuous monitoring, enabling companies to provide maximum cloud benefits</p>

## Hybrid Cloud

The thought of mixing the two – private and public cloud – or a hybrid cloud becomes more necessary as demand for scalability grows more pronounced for IT departments – where often the time, team, and talent are inadequate for supporting major deployments. One approach is for a Cloud provider to provide a customer a mixture of dedicated remote services via its use of a dedicated private Cloud with others distributed with a public Cloud.



## Workload Execution Venues – A Constant Rebalancing ACT

### Public Cloud – Not Necessarily Forever



Source: 451 Research, Voice of the Enterprise, Cloud Transformation 2017



A number of companies have been funded to manage **private cloud deployments**, as well as hybrid cloud deployments:

	<p><b>Turbonomic Networks</b> is a provider of a hybrid cloud management platform intended to provide on-premises and public cloud to self-manage in real-time. The company's platform includes a patented decision engine which curates workload demand to dynamically control resource supply,</p>
	<p><b>Stratoscale</b> is a developer of virtualization technology designed to focus on leveraging technology to help IT teams make better and more profitable usage of existing infrastructures. The company raised \$70MM of Series C venture funding in a deal led by Qualcomm Ventures on January 1, 2016. Western Digital Capital, Battery Ventures, Bessemer Venture Partners, Cisco, Intel Capital and SanDisk Ventures also participated in the round. Directors and board observers include: Adam Fisher (Bessemer Venture Partners), Andrew Fligel (Intel Capital)</p>

## Top M&amp;A Trends in Infrastructure Software

	<p><b>Scalr</b> provides a cloud management platform designed to automate and standardize application deployments across multi-cloud environments. The company's cloud management platform utilizes a hierarchical, top-down approach to policy enforcement, enabling administrators to find the balance between the needs of finance, security, IT and development teams. The company raised \$7.35MM of Series A venture funding in a deal led by OpenView Venture Partners on January 6, 2016, putting the company's pre-money valuation at \$19.5MM. Directors and board observers include: Mackey Craven (OpenView Venture Partners), Jim Baum (OpenView Venture Partners), John True (Cultivation Capital) (Cultivation Capital)</p>
	<p><b>Faction</b> provides public cloud IaaS software designed to offer cloud services to private, public and hybrid cloud services. The company's platform provides cost-effective VMware based clouds for Hybrid &amp; Multi-Cloud deployments. The company received \$14MM of development capital from Charterhouse Strategic Partners, Dell Technologies Capital, Meritage Funds, River Cities Capital Funds and Sweetwater Capital Group on April 03, 2019.</p>
	<p><b>Aviatrix</b> provides cloud native networking software designed to reduce the time to setup new virtual private networks and ease migrating applications to the cloud. The company raised \$15MM of Series B venture funding in a deal led by Charles River Ventures on January 18, 2017, putting the pre-money valuation at \$36.96MM. Formation 8, Steve Mullaney and Ignition Venture Partners also participated in this round. Directors and board observers include: Devdutt Yellurkar (Charles River Ventures), Preeti Rathi, Nick Sturiale (Ignition Partners), Shirish Sathaye (Formation 8)</p>
	<p><b>Platform9</b> provides an open source-as-a-service platform designed to help companies manage hybrid clouds across any infrastructure and transforming their existing infrastructure into a self-service private cloud. The company raised \$19MM of Series C venture funding from lead investor NGP Capital on April 25, 2019, putting the pre-money valuation at \$130MM. Directors and board observers include: Gary Little (Canvas Venture Fund)</p>
	<p><b>Unitas Global</b> offers private or hybrid cloud, network monitoring and management services, enabling clients to manage infrastructure on their own. The company raised \$10MM of development capital from Boathouse Capital, MK Capital and Azure Capital on December 12, 2017, putting the company's pre-money valuation at \$65MM. Boathouse Capital led the round with the participation of MK Capital and Azure Capital. Directors and board observers include: Andrew Olsen (Boathouse Capital), Paul Weinstein, Ali Wasti (Azure Capital), Bret Maxwell (MK Capital)</p>
	<p><b>Zentera</b> provides hybrid cloud infrastructure platform as an overlay network plane across multiple private and cloud domains that connects dispersed public, private and managed hosted network domains. The company raised \$5MM of venture funding from an undisclosed investor on June 12, 2018.</p>
	<p><b>Pensando Systems</b> is the developer of an end-to-end services platform intended to offer a holistic solution for cloud, compute, networking, storage and security offerings. The company is pioneering distributed computing by powering software-defined cloud, compute networking, storage and security services, providing users with technology to transform existing architectures into the secure, ultra-fast environments demanded by next-generation applications.</p>

## Top M&A Trends in Infrastructure Software







 <b>EMBOTICS®</b>	<p><b>Embotics</b> is a provider of cloud management services designed to offer purchase decisions, service design and product research. The company's cloud management services automate provisioning across private, public, hybrid cloud infrastructures and enhances self-service capabilities, enabling businesses to use the power and simplicity of cloud management to improve their productivity. The company raised \$2MM of venture funding from undisclosed investors on July 9, 2018.</p>
 <b>HYPERGRID</b>	<p><b>HyperGrid</b> provides a Software-Defined Cloud solution that is designed to deliver an advanced multi-cloud platform that intelligently deploys and manages workloads across any combination of data centers, public or private clouds, with automated cost, performance, and compliance optimization. The company raised \$25MM through a combination of debt and Series C venture funding in a deal led by Atlantic Bridge Capital and HighBar Partners on September 12, 2018, putting the company's pre-money valuation at \$12.5MM. Acero Capital also participated in the round. Directors and board observers include: Kevin Dillon (Atlantic Bridge Capital)</p>



## The Cloud Comes Full Circle with Edge Clouds

Since 2006 the rallying cry has been “move to cloud”. Cloud is lower cost, it has the latest features, it has infinite capacity, you can rent and not buy. Over the years, on-premise, where the bulk of IT spend still takes place, has tried to emulate the cloud to share in some of the benefits, notably cost savings and speed of deployment.

Unsuccessfully for the most part. The cloud is the only place you need for everything you need was the mantra. That was until 2019, when the public clouds announced that they will be offering a version of public cloud that can be deployed at the edge. What is the edge? It is whatever you want it to be. It is the enterprise datacenter, it is the manufacturing floor, it is the Telco mobile network. Edge comes in 3 different forms from the 3 main public clouds providers.

	 *	 *	 *
Product name	Anthos	Outpost	Azure Stack
Software	<ul style="list-style-type: none"> <li>Google Kubernetes Engine (GKE)</li> <li>Config Management</li> <li>Service Mesh</li> <li>Security</li> </ul>	<ul style="list-style-type: none"> <li>Elastic Container Service (ECS)</li> <li>Elastic Kubernetes Service (EKS)</li> <li>Relational Database Service (RDS)</li> <li>Elastic MapReduce (EMR)</li> <li>AWS Nitro System</li> </ul>	<ul style="list-style-type: none"> <li>Machine Learning at the edge</li> <li>Edge and IoT solutions</li> <li>Network data transfer from edge to cloud</li> </ul>
Hardware	<ul style="list-style-type: none"> <li>Anthos is completely software-based and requires no additional hardware</li> </ul>	 <ul style="list-style-type: none"> <li>Multiple racks at a site can be configured as a single pool of capacity</li> </ul>	  <ul style="list-style-type: none"> <li><b>Commercial Series</b> Tailored for most commercial scenarios, such as retail stores and datacenters</li> <li><b>Rugged Series</b> Portable appliance tailored for harsh environmental or field conditions in defense, disaster relief, geological survey and energy scenarios</li> </ul>




Source: Amazon Outpost, Microsoft Azure, Google Cloud, Computer World, Replex

## Top M&A Trends in Infrastructure Software

In addition to the 3 main public cloud providers deploying their own edge solutions, there are the following companies in this sector:

	<p><b>EdgePresence</b> is an owner and operator of multi-tenant, edge computing points-of-presence (PoPs), providing space, power, bandwidth, and interconnection, is currently deploying its edge data centers (EDCs) across 20 markets throughout the U.S. Edge Data Centers are purpose-built data centers, comprehensively and compactly designed to include critical power, monitoring, physical security and cooling. EDCs are anchored at the base of cell towers, key real estate, and enterprise campus locations enabling them to deploy within 12 miles from end users, often referred to as the “far edge.”</p>
	<p><b>Pensando</b> provides an end-to-end services platform intended to offer a holistic solution for cloud, compute, networking, storage and security offerings. The company is pioneering distributed computing by powering software-defined cloud, compute networking, storage and security services, providing users with technology to transform existing architectures into the secure, ultra-fast environments demanded by next-generation applications. On October 16, 2019, the company raised a \$145 million Series C. The round was led by Hewlett Packard Enterprise and Lightspeed Venture Partners and brings Pensando’s total raised so far to \$278 million.</p>
	<p><b>Vapor IO</b> provides fully-integrated hardware and software services designed to address the changing requirements of the new workloads. The company's services include a hyper-modular service that aims to lower costs when building and running data-driven data centers and eliminate integration problems. The company is the creator of the Kinetic Edge® platform and Kinetic Edge Exchange™ (KEX), the first nationwide platform for edge colocation and networking services. On January 22, 2020, the company announced an additional investment by private equity firm Berkshire Partners and Crown Castle, bringing its aggregate Series C funding to \$90 million.</p>
	<p><b>Hailo</b> is the developer of a deep learning microprocessor created to deliver data center performance to edge devices. The company's technology runs embedded AI applications on edge devices that are installed in autonomous vehicles, drones and smart home appliances such as personal assistants, smart cameras and smart TVs, alongside IoT, AR and VR platforms, wearables and security products. The company raised \$60 million in series B funding led by previous and new strategic investors on March 5, 2020. The tranche will be used to accelerate the rollout of Hailo’s Hailo-8 chip</p>
	<p><b>Volterra</b> is the developer of an edge computing platform designed to solve problems that require low-latency computing. The company's platform helps to deploy, connect, secure and operate applications and data across multi-cloud and edge sites, enabling businesses to manage applications in hybrid environments. The company raised \$50 million in funding to date, contributed by backers including Khosla Venture, and Mayfield as well as strategic investors Microsoft, Itochu, and Samsung.</p>

## Top M&A Trends in Infrastructure Software

	<p><b>EdgeMicro</b> is a provider of data centers intended to deploy data and deliver the content easily. The company's data centers provide content, computation and connectivity to occur at the extreme network edge facilitating the new mobile internet era with peering, wireless and data center expertise, enabling clients to reduce bandwidth cost and improve the quality of service. The company raised \$5 million of seed funding from undisclosed investors on May 12, 2020.</p>
	<p><b>D2IQ</b> is the developer of a data center operating system intended to simplify operational efforts for maximum impact. The company empowers organizations to better navigate and accelerate the success of cloud deployment with enterprise-grade technologies on shared resources that span the data center, enabling enterprises to embrace open source and cloud-native innovations in a hassle-free manner.</p>
	<p><b>Faction</b> is the developer of enterprise-class Infrastructure-as-a-Service (IaaS) software designed to offer cloud services. The company's software provides cost-effective VMware based clouds with administrator-level access to VMware vCenter, providing control, flexibility, and integration capabilities for hybrid and multi-cloud deployments, enabling clients to take immediate advantage of the growing cloud services market, maintain customer ownership and maximize profitability.</p>

## Cloud Migration Services

Cloud migration remains a critical capability for the following entities:

- Cloud services providers to ease the switch to cloud.
- Cloud application vendors to facilitate corporate knowledge locked in accumulated corporate data.
- Corporations wishing to make the switch to cloud on their own terms and require reasonably bespoke solutions matching legacy systems with unique capabilities they would like to maintain.



The category is complex with both the source and the target of the migration constantly changing. On the source side the technology can be virtual machines, big data, ML, Spark, containers, various evolving categories of databases and storage — to consider just a few — and there are multiple version of the tech. On the target side (the cloud provider) we have a dizzying, and often bespoke, multitude of SKUs to choose from.

The complexity means that the sector remains a fertile one for innovation and new approaches despite many headline acquisitions of tech over the past few years. Such as:

**Google transfer service:** <https://techcrunch.com/2019/12/12/google-makes-moving-data-to-its-cloud-easier/>

**Cornerstone:** Google acquires Mainframe Migration service <https://techcrunch.com/2020/02/19/google-cloud-acquires-mainframe-migration-service-cornerstone/>




### Cloud Migration Companies:

	<p><b>ZConverter</b> provides cloud migration and cloud-based disaster recovery SaaS solutions. With cloud migration, enterprises can move on-premises to the cloud or cloud service providers can move customers' cloud instances to their clouds. Provides an automated cloud migration for Azure, AWS, CloudStack and OpenStack. Its cloud-based disaster recovery software seeks to solve the problem of high cost legacy disaster recovery services by combining with cloud infrastructure services such as Amazon, Microsoft, Google Cloud and OpenStack/CloudStack.</p>
	<p><b>CloudSimple</b> was acquired by Alphabet (NAS: GOOGL) for an undisclosed amount on November 18, 2019. Provider of a next-generation cloud-based platform designed to offer cloud infrastructure services. The company's cloud-based platform improves efficiency and control for enterprise applications, enabling clients to manage enterprises.</p>

## Top M&amp;A Trends in Infrastructure Software

	<p><b>Mover</b> was acquired by Microsoft (NAS: MSFT) for an undisclosed amount on October 21, 2019. The company is a developer and provider of cloud migration services intended to move files from one cloud service to another. The company's platform has many connectors that offer to schedule and automate migration, powerful migration manager and detailed logs, enabling businesses to change cloud-storage providers, back up websites or files, and automate and schedule these processes to make life that much easier.</p>
	<p><b>Movere</b> was acquired by Microsoft (NAS: MSFT) for an undisclosed amount on September 4, 2019. The acquisition will help Microsoft to move their existing applications and infrastructure to Azure. The company is a developer of a SaaS platform designed to help clients plan cloud migrations and continuously optimize, monitor and analyze IT environments. The company's platform increases business intelligence by accurately presenting entire IT environments within a single day.</p>
	<p><b>UnifyCloud</b> is a Redmond, WA based private company whose line of business is custom computer programming services.</p>
	<p><b>CloudEndure</b> was acquired by Amazon.com (NAS: AMZN) for an estimated \$250 million on January 10, 2019. This acquisition expands Amazon ability to deliver innovative and flexible migration, backup, and disaster recovery solutions. The company is a provider of cloud migration and disaster recovery services intended to provide solutions for disaster recovery, continuous backup and live migration.</p>
	<p><b>Alooma</b> was acquired by Alphabet (NAS: GOOGL) for approximately \$150 million on February 21, 2019. The company is a provider of a data platform intended to help users build data pipelines. The company's platform handles the data pipelines and manages them, enabling customers to streamline and automate migration experience to Google Cloud as well as access a full range of database services, from managed open source database offerings to services like Cloud Spanner and Cloud Bigtable.</p>
	<p><b>Velostrata</b> was acquired by Alphabet (NAS: GOOGL) for an undisclosed amount on May 17, 2018. Earlier, the company joined Microsoft ScaleUp as part of the 2017 Class on April 24, 2017. The company is a developer of a cloud workload mobility platform designed to move enterprise workloads to the public cloud. The company's Velostrata platform makes it possible to migrate applications and their data to Azure cloud.</p>

## Top M&A Trends in Infrastructure Software

	<p><b>RiverMeadow</b> is a provider of integrated, end-to-end multi-cloud migration platform and services designed to help in analyzing potential cloud destinations. The company's services solve the challenge of migrating large, complex workloads cross hypervisors into and between cloud environments. The company raised \$1.5 million of venture funding from CloudScale Capital Partners and other undisclosed investors on August 19, 2019.</p>
	<p><b>Clouber</b> is a provider of a cloud-based life cycle management platform. The company offers elastic container management using their placement technology. It also offers an end to end container management software across private and public cloud networks. The company joined Alchemist Accelerator and received \$24,000 in funding on April 7, 2016.</p>
	<p><b>UnifyCloud</b> developed a suite of tools that automate some of the most difficult, arduous and time-consuming cloud migration tasks – we call this CloudAtlas. We utilize these tools to serve clients and partners to allow organizations to accelerate and simplify the cloud migration journey.</p>



# 4

## Large Public/Private Acquirers

### 4.1 Amazon Web Services | Private Company Profile

#### General Information

##### Description

Provider of a cloud-based web platform intended to offer information technology infrastructure services. The company's services are offered via a scalable computing platform in the cloud including cloud computing, compute, networking, storage and content delivery, databases, analytics, application services, deployment and management, mobile services, investments enabling e-commerce startups to build and grow their cloud business while accelerating their sales online.

<b>Entity Types</b>	Private Company Acquirer	<b>Year Founded</b>	2006
<b>Website</b>	aws.amazon.com	<b>Universe</b>	Other Private Companies
<b>Also Known As</b>	AWS	<b>Parent Company</b>	Amazon.com
<b>Legal Name</b>	Amazon Web Services, Inc.	<b>Primary Industry</b>	Social/Platform Software
<b>Business Status</b>	Generating Revenue	<b>Other Industries</b>	Other Commercial Services, IT Consulting and Outsourcing
<b>Ownership Status</b>	Privately Held (no backing)	<b>Verticals</b>	SaaS, Mobile, TMT
<b>Financing Status</b>	Corporation		

#### Contact Information

##### Primary Office

P.O. Box 81226  
Seattle, WA 98108  
United States

**Phone:** +1 (206) 266-4064

**Fax:** +1 (206) 266-7010

#### Last 10 Investments | Buy Side

Company Name	Deal Date	Deal Type	Deal Size	Co-Investors	Company Stage	Industry
Wiliot	18-Feb-2020	Early Stage VC (Series B)	\$70M	13	Generating Revenue	Application Specific Semiconductors
Zobi	31-Dec-2019	Grant	\$0.1M		Product In Beta Test	Other Communications and Networking
Kings Learning	04-Nov-2019	Accelerator/Incubator			Generating Revenue	Educational Software
Deep01	01-Sep-2019	Grant	\$0.06M		Generating Revenue	Other Healthcare Technology Systems

# Top M&A Trends in Infrastructure Software

Nash2	22-Aug-2019	Accelerator/Incubator	\$0.1M	5	Generating Revenue	Media & Information Services (B2B)
Pro Football Focus	19-Aug-2019	Merger/Acquisition			Generating Revenue	Publishing
Fast Forward (Consulting Services)	02-Jul-2019	Grant	\$5MM	7	Startup	Consulting Services
TSO Logic	14-Jan-2019	Merger/Acquisition			Generating Revenue	Database Software
OpenSCG	03-Dec-2018	Merger/Acquisition			Generating Revenue	IT Consulting and Outsourcing
DroneInch	15-Nov-2018	Seed Round	\$0.1MM		Generating Revenue	Business Software

† Indicates an Add-On

E Estimated

x Investor Exited Deal

## 4.2 Cloudera (NYS: CLDR) | Public Company Profile

### General Information

#### Description

Developer of a data management and analytics platform designed to turn data into real business value. The company's Cloudera Enterprise Data Hub is a secure and flexible big data software that offers data engineering and science, operational database with real-time insights for modern data-driven business and analytic database all within this single, easy-to-use product, enabling businesses to access the unlimited and untapped opportunities currently hidden within their data and gain unparalleled value from both data at rest and data in motion to explore data in greater and deeper context.

<b>Entity Types</b>	Public Company, Acquirer	<b>Year Founded</b>	2008
<b>Website</b>	<a href="http://www.cloudera.com">www.cloudera.com</a>	<b>Universes</b>	Private Equity, Publicly Listed, Venture Capital
<b>Legal Name</b>	Cloudera, Inc.	<b>SIC Code</b>	(7372) Services-prepackaged software
<b>Business Status</b>	Profitable	<b>Primary Industry</b>	Database Software
<b>Ownership Status</b>	Publicly Held	<b>Other Industries</b>	Business/Productivity Software
<b>Financing Status</b>	Formerly VC-backed	<b>Verticals</b>	TMT, SaaS, Big Data
		<b>Employees</b>	2,700

### Contact Information

#### Primary Office

395 Page Mill Road  
Palo Alto, CA 94306  
United States

**Phone:** +1 (650) 362-0488

**Fax:** +1 (888) 789-1488

### Investments | Buy Side (9)

Company Name	Deal Date	Deal Type	Deal Size	Co-Investors	Company Stage	Industry
Arcadia Data	04-Sep-2019	Merger/Acquisition			Generating Revenue	Business/Productivity Software
Hortonworks	03-Jan-2019	Merger/Acquisition	\$1B		Profitable	Database Software
Cloudera Fast Forward Labs	07-Sep-2017	Merger/Acquisition			Startup	Social/Platform Software
Sense Enterprise	24-Mar-2016	Merger/Acquisition			Generating Revenue	Business/Productivity Software
Cazena	22-Jul-2015	Early Stage VC (Series B)	\$20MM	4	Generating Revenue	Database Software

# Top M&A Trends in Infrastructure Software

xCask	05-May-2015	Early Stage VC	Generating Revenue	Database Software
Xplain	03-Feb-2015	Merger/Acquisition	Startup	Business/Productivity Software
DataPad	30-Sep-2014	Merger/Acquisition	Startup	Business/Productivity Software
Gazzang	03-Jun-2014	Merger/Acquisition	Generating Revenue	Network Management Software

† Indicates an Add-On

E Estimated

x Investor Exited Deal

### 4.3 Hortonworks | Private Company Profile

#### General Information

##### Description

Provider of an enterprise-ready open and connected data platform designed for storing, managing and analyzing data. The company's enterprise-ready open and connected data platform delivers actionable intelligence from all data like data-in-motion and data-at-rest as well as offers expertise, training and services, enabling customers to unlock transformational value for their organizations across any line of business.

Entity Types	Private Company	Year Founded	2011
Website	<a href="http://www.hortonworks.com">www.hortonworks.com</a>	Universes	Venture Capital
Legal Name	Hortonworks, Inc.	Spun Out Of	Yahoo
Business Status	Profitable	SIC Code	(7372) Services-prepackaged software
Ownership Status	Acquired/Merged (Cloudera)	Primary Industry	Database Software
Financing Status	Formerly VC-backed	Other Industries	Software Development Applications
		Verticals	TMT, Big Data
		Employees	1,410

#### Contact Information

##### Primary Office

5470 Great America Parkway  
 Santa Clara, CA 95054  
 United States  
**Phone:** +1 (855) 846-7866  
[info@hortonworks.com](mailto:info@hortonworks.com)

#### Investments | Buy Side (3)

Company Name	Deal Date	Deal Type	Deal Size	Co-Investors	Company Stage	Industry
Onyara	31-Aug-2015	Merger/Acquisition	\$27MM		Startup	Network Management Software
SequenceIQ	30-Apr-2015	Merger/Acquisition	\$8MM		Startup	Application Software
XA Secure	15-May-2014	Merger/Acquisition			Generating Revenue	Business/Productivity Software

† Indicates an Add-On

E Estimated

x Investor Exited Deal

## 4.4 Red Hat | Private Company Profile

### General Information

#### Description

Developer of cloud-based open source, enterprise information technology services designed to fulfill information technology infrastructure needs of enterprises. The company's cloud-based open source, enterprise information technology services develop software differently, enabling application developers to resolve business challenges and develop applications faster.

<b>Entity Types</b>	Private Company	<b>Year Founded</b>	1993
<b>Website</b>	<a href="http://www.redhat.com">www.redhat.com</a>	<b>Universes</b>	M&A, Private Equity, Publicly Listed, Venture Capital
<b>Formerly Known As</b>	Red Hat Software	<b>SIC Codes</b>	(7371) Services-computer programming services, (7370) Services-computer programming, data processing, etc.
<b>Legal Name</b>	Red Hat, Inc.	<b>Primary Industry</b>	Systems and Information Management
<b>Business Status</b>	Profitable	<b>Other Industries</b>	Operating Systems Software
<b>Ownership Status</b>	Merged/ Acquired (IBM)	<b>Verticals</b>	TMT, SaaS
<b>Financing Status</b>	Corporate Backed or Acquired	<b>Employees</b>	13,360

### Contact Information

#### Primary Office

100 East Davie Street

Raleigh, NC 27601

United States

**Phone:** +1 (919) 754-4950

**Fax:** +1 (919) 800-3804

[info@redhat.com](mailto:info@redhat.com)

### Last 10 Investments | Buy Side

Company Name	Deal Date	Deal Type	Deal Size	Co-Investors	Company Stage	Industry
NooBaa	27-Nov-2018	Merger/Acquisition			Generating Revenue	Business/Productivity Software
CoreOS	30-Jan-2018	Merger/Acquisition	\$250MM		Generating Revenue	Systems and Information Management
Permabit	31-Jul-2017	Merger/Acquisition	\$50MM		Generating Revenue	Business/Productivity Software
Codenvy	01-Jun-2017	Merger/Acquisition			Generating Revenue	Software Development Applications
3scale	24-Jun-2016	Merger/Acquisition			Generating Revenue	Operating Systems Software



# Top M&A Trends in Infrastructure Software

Ansible	16-Oct-2015	Merger/Acquisition	\$126MM		Startup	Systems and Information Management
Turbonomic	06-May-2015	Corporate			Generating Revenue	Automation/ Workflow Software
FeedHenry	09-Oct-2014	Merger/Acquisition	\$81MM <sup>E</sup>		Generating Revenue	Application Software
xBlack Duck	26-Aug-2014	Later Stage VC (Series A2)	\$20MM	8	Generating Revenue	Network Management Software
eNovance	24-Jun-2014	Merger/Acquisition	\$95MM		Generating Revenue	Systems and Information Management

† Indicates an Add-On

E Estimated

x Investor Exited Deal

## 4.5 VMware (NYS: VMW) | Public Company Profile

### General Information

#### Description

Provides virtualization infrastructure management software products. The company's software products enable organizations to aggregate multiple servers, storage infrastructure, and networks together into shared pools of capacity that can be allocated dynamically and securely to applications as needed, increasing hardware utilization and reducing IT spending.

<b>Entity Types</b>	Public Company, Acquirer	<b>Year Founded</b>	1998
<b>Website</b>	<a href="http://www.vmware.com">www.vmware.com</a>	<b>Universes</b>	Publicly Listed, Venture Capital
<b>Legal Name</b>	Vmware, Inc.	<b>Spun Out Of</b>	Dell EMC
<b>Business Status</b>	Profitable	<b>SIC Code</b>	(7372) Services-prepackaged software
<b>Ownership Status</b>	Publicly Held	<b>Primary Industry</b>	Business/Productivity Software
<b>Financing Status</b>	Formerly VC-backed	<b>Other Industries</b>	Operating Systems Software
		<b>Verticals</b>	TMT, SaaS
		<b>Employees</b>	24,200

### Contact Information

#### Primary Office

3401 Hillview Avenue  
Palo Alto, CA 94304  
United States

**Phone:** +1 (650) 427-5000

**Fax:** +1 (650) 427-5001

### Last 10 Investments | Buy Side

Company Name	Deal Date	Deal Type	Deal Size	Co-Investors	Company Stage	Industry
Lastline	04-Jun-2020	Merger/Acquisition			Generating Revenue	Network Management Software
Octarine	27-May-2020	Merger/Acquisition			Generating Revenue	Network Management Software
Nyansa	21-Jan-2020	Merger/Acquisition			Generating Revenue	Business/Productivity Software
Pivotal Software	30-Dec-2019	Merger/Acquisition	\$2.7B		Generating Revenue	Software Development Applications
Carbon Black (US)	08-Oct-2019	Merger/Acquisition	\$2B		Profitable	Network Management Software

# Top M&A Trends in Infrastructure Software

Bitnami	18-Sep-2019	Merger/Acquisition		Profitable	Software Development Applications
Pivotal Software	22-Aug-2019	Merger/Acquisition	\$3.3B	Generating Revenue	Software Development Applications
Intrinsic (cybersecurity)	21-Aug-2019	Merger/Acquisition		Generating Revenue	Network Management Software
Bitfusion	06-Aug-2019	Merger/Acquisition		Generating Revenue	Business/Productivity Software
Uhana	26-Jul-2019	Merger/Acquisition		Generating Revenue	Business/Productivity Software

† Indicates an Add-On

E Estimated

x Investor Exited Deal

## 5

## Public Company Comparables

## 5.1 Infrastructure Software and Container Security

Companies	Country	Market cap (US\$ mn)	Ent. Value (US\$ mn)	EV/Sales				EV/EBITDA			
				LTM	2019	2020	2021	LTM	2019	2020	2021
Infrastructure Software											
Microsoft Corporation	United States	1,519,266	1,465,665	10.6x	10.9x	9.8x	8.8x	22.9x	24.0x	21.3x	19.1x
Amazon.com, Inc.	United States	1,373,918	1,402,495	4.7x	5.0x	4.0x	3.4x	38.2x	46.0x	31.6x	23.3x
Cisco Systems, Inc.	United States	190,932	179,439	3.5x	3.5x	3.6x	3.6x	11.0x	11.0x	10.0x	10.0x
Oracle Corporation	United States	167,335	199,093	5.1x	5.0x	5.1x	5.1x	11.6x	11.6x	10.6x	10.4x
International Business Machines Corporation	United States	105,686	163,251	2.1x	2.1x	2.2x	2.2x	10.1x	9.8x	9.9x	8.9x
Atlassian Corp. Plc Class A	Australia	44,521	43,600	nm	nm	nm	nm	nm	nm	nm	nm
Splunk Inc.	United States	30,668	31,048	13.1x	13.5x	12.8x	10.4x	nm	nm	nm	nm
Okta, Inc.	United States	25,448	25,142	nm	nm	nm	nm	nm	nm	nm	nm
VeriSign, Inc.	United States	23,698	24,352	nm	nm	nm	nm	28.4x	28.6x	27.3x	25.7x
Fortinet, Inc.	United States	21,957	20,599	9.1x	9.6x	8.3x	7.1x	47.2x	nm	30.2x	25.1x
Palo Alto Networks, Inc.	United States	21,888	21,726	6.7x	7.0x	6.0x	5.1x	nm	nm	26.3x	22.4x
Citrix Systems, Inc.	United States	17,393	19,026	6.0x	6.3x	6.0x	5.8x	21.7x	24.0x	17.9x	17.3x
Check Point Software Technologies Ltd.	Israel	15,476	13,733	6.8x	6.9x	6.8x	6.6x	15.2x	15.2x	13.9x	13.7x
Hewlett Packard Enterprise Co.	United States	12,167	24,054	0.9x	0.8x	0.9x	0.9x	5.4x	5.1x	5.5x	5.2x
NortonLifeLock Inc.	United States	11,504	13,563	4.4x	4.4x	5.5x	5.4x	13.4x	14.4x	11.2x	10.3x
Proofpoint, Inc.	United States	6,152	6,018	6.4x	6.8x	5.9x	5.0x	nm	nm	42.9x	31.9x
LogMeIn, Inc.	United States	4,143	4,261	3.3x	3.4x	3.2x	3.0x	12.6x	12.4x	10.7x	9.7x
Cloudera, Inc.	United States	3,876	3,676	4.5x	4.8x	4.4x	4.0x	nm	nm	21.6x	16.1x
CyberArk Software Ltd.	Israel	3,767	3,101	7.0x	7.1x	6.8x	5.7x	nm	42.5x	33.8x	24.8x
Software AG	Germany	2,954	2,663	2.7x	2.7x	2.8x	2.7x	9.8x	9.3x	12.1x	11.4x
Varonis Systems, Inc.	United States	2,798	2,735	10.9x	10.8x	10.7x	9.1x	nm	nm	nm	nm
Mimecast Limited	United Kingdom	2,722	2,778	6.5x	6.9x	5.9x	5.1x	41.4x	nm	30.4x	24.7x
FireEye, Inc.	United States	2,641	2,771	3.1x	3.1x	3.1x	2.9x	nm	nm	34.2x	25.2x
SailPoint Technologies Holdings, Inc.	United States	2,414	2,301	7.6x	8.0x	7.3x	6.4x	nm	nm	nm	nm
Teradata Corporation	United States	2,221	2,489	1.3x	1.3x	1.4x	1.3x	14.4x	14.7x	8.2x	6.6x
Progress Software Corporation	United States	1,693	1,808	4.2x	4.3x	4.2x	4.2x	12.3x	13.6x	9.3x	9.2x
Intellicheck Inc	United States	132	130	13.7x	nm	10.9x	6.9x	nm	nm	nm	21.6x
Mean				6.0x	5.8x	5.7x	5.0x	19.7x	18.8x	19.9x	16.9x
Median				5.6x	5.0x	5.7x	5.1x	13.9x	14.4x	17.9x	16.7x
Container Security											
Trend Micro Incorporated	Japan	7,787	6,332	4.1x	4.2x	3.9x	3.7x	12.5x	12.9x	13.3x	12.7x
Qualys, Inc.	United States	4,005	3,722	11.2x	11.6x	10.4x	9.2x	33.8x	35.2x	24.5x	21.3x
Tenable Holdings, Inc.	United States	3,087	2,906	7.7x	8.2x	6.8x	5.7x	nm	nm	nm	nm
Rapid7 Inc.	United States	2,491	2,518	7.2x	7.7x	6.4x	5.4x	nm	nm	nm	nm
Mean				7.6x	7.9x	6.9x	6.0x	23.1x	24.0x	18.9x	17.0x
Median				7.5x	7.9x	6.6x	5.6x	23.1x	24.0x	18.9x	17.0x

Note: Market Cap and Enterprise Value as of 25-06-2020; Note: Multiples are calendarized to December; Note: All figures in US\$ mn

## Top M&amp;A Trends in Infrastructure Software

## 5.2 Devops

Companies	Country	Market cap (US\$ mn)	Ent. Value (US\$ mn)	EV/Sales				EV/EBITDA			
				LTM	2019	2020	2021	LTM	2019	2020	2021
DevOps											
Microsoft Corporation	United States	1,519,266	1,465,665	10.6x	10.9x	9.8x	8.8x	22.9x	24.0x	21.3x	19.1x
Alphabet Inc.	United States	983,724	883,299	5.3x	5.5x	5.2x	4.3x	18.6x	18.7x	15.4x	12.5x
Cisco Systems, Inc.	United States	190,932	179,439	3.5x	3.5x	3.6x	3.6x	11.0x	11.0x	10.0x	10.0x
Oracle Corporation	United States	167,335	199,093	5.1x	5.0x	5.1x	5.1x	11.6x	11.6x	10.6x	10.4x
International Business Machines Corporation	United States	105,686	163,251	2.1x	2.1x	2.2x	2.2x	10.1x	9.8x	9.9x	8.9x
Atlassian Corp. Plc	Australia	44,521	43,600	nm	nm	nm	nm	nm	nm	nm	nm
Splunk Inc.	United States	30,668	31,048	13.1x	13.5x	12.8x	10.4x	nm	nm	nm	nm
HP Inc.	United States	23,408	25,987	0.5x	0.4x	0.5x	0.5x	5.5x	5.5x	5.8x	5.7x
Fastly, Inc.	United States	8,414	8,259	nm	nm	nm	nm	nm	nm	nm	nm
New Relic, Inc.	United States	4,159	3,849	6.4x	6.7x	5.9x	5.1x	nm	nm	nm	46.9x
PagerDuty, Inc.	United States	2,279	1,963	11.0x	12.1x	9.6x	7.8x	nm	nm	nm	nm
Micro Focus International plc	United Kingdom	1,776	6,116	1.8x	1.9x	2.1x	2.2x	4.7x	4.8x	5.7x	5.8x
Spirent Communications plc	United Kingdom	1,745	1,595	3.2x	3.2x	3.0x	2.9x	14.0x	14.1x	13.7x	13.0x
Cigniti Technologies Limited	India	104	97	0.8x	0.8x	na	na	5.4x	5.4x	na	na
Mean				5.3x	5.5x	5.4x	4.8x	11.5x	11.7x	11.6x	14.7x
Median				4.3x	4.2x	5.1x	4.3x	11.0x	11.0x	10.3x	10.4x

Note: Market Cap and Enterprise Value as of 25-06-2020

Note: Multiples are calendarized to December

Note: All figures in US\$ mn

## Top M&amp;A Trends in Infrastructure Software

## 5.3 Infrastructure Software

Announced Date	Target Company	Target Country	Bidder Company	Bidder Dominant Country	Enterprise Value (\$mn)	EV/Revenue (x)	EV/EBIT (x)	EV/EBITDA (x)
06/18/2020	Zerto Ltd.	Israel,USA	Battery Ventures LP; Kreos Capital; U.S. Venture Partners; Institutional Venture Partners; Poalim Capital Markets Ltd.; RTP Ventures; Harmony Partners; Claltech; 83North Ltd	USA	-	-	-	-
06/17/2020	Synthesis Technology	USA	Blue Horizon Software Holdings LLC	USA	-	-	-	-
06/10/2020	Domino Data Lab, Inc.	USA	Sequoia Capital; Highland Capital Partners, LLC; Coatue Management, L.L.C; Highland Europe (UK) LLP; Dell Technologies Capital	USA	-	-	-	-
06/10/2020	Qualtera	France	Synopsys, Inc.	USA	-	-	-	-
06/03/2020	Totara Learning Solutions Limited	New Zealand	Five V Capital Pty Ltd.	Australia	-	-	-	-
05/28/2020	ThousandEyes, Inc.	USA	Cisco Systems, Inc.	USA	1,000	-	-	-
05/26/2020	Delman	Indonesia	Intudo Ventures; Qlue; PT Prasetya Dwidharma	Indonesia	-	-	-	-
05/19/2020	VIZIYA Corporation	Canada	Prometheus Group Enterprises, LLC	USA	35	-	-	-
05/13/2020	Semperis Ltd	USA	Insight Partners; Silvertech Ventures; Maverick Ventures Israel	USA	-	-	-	-
05/05/2020	Collaborative Solutions, LLC	USA	Cognizant Technology Solutions Corporation	USA	-	-	-	-
05/05/2020	SAP SE (Digital Interconnect business)	USA	Sinch AB (publ)	Sweden	245	0.7	-	14.6
05/04/2020	Cumulus Networks, Inc.	USA	NVIDIA Corporation	USA	-	-	-	-
04/28/2020	o9 Solutions, Inc.	USA	Kohlberg Kravis Roberts & Co. L.P.	USA	1,000	-	-	-
04/27/2020	Sonic Foundry, Inc. (67.54% Stake)	USA	Mark Burish (private investor)	USA	37	1.1	-	-
04/23/2020	Indusface Pvt Ltd	India,USA	Tata Capital Private Equity	India	-	-	-	-
04/15/2020	Arxan Technologies, Inc.	USA	Digital.ai, Software Inc.	USA	-	-	-	-
04/10/2020	Fusionex International plc	Malaysia	Hitachi, Ltd.	Japan	-	-	-	-
04/07/2020	Accellion, Inc.	Singapore,USA	Bregal Sagemount	USA	-	-	-	-
04/07/2020	Revolutionary Security LLC	USA	Accenture Plc	Ireland (Republic)	75	-	-	-
03/25/2020	Espressive, Inc.	USA	Insight Partners; General Catalyst Partners; Wing Venture Partners	USA	-	-	-	-
03/25/2020	ModuleQ, Inc.	USA	Refinitiv	USA	-	-	-	-
03/17/2020	Spectro Cloud, Inc.	USA	Sierra Ventures; BOLDstart Ventures	USA	-	-	-	-
03/17/2020	Technology Services Group, Inc.	USA	Alfresco Software, Inc.	USA	-	-	-	-
03/12/2020	Cleanshelf, Inc.	USA	Dawn Capital LLP; LAUNCHub Ventures	United Kingdom	-	-	-	-
03/12/2020	Noodle Analytics, Inc.	USA	Mitsubishi Corporation; TPG Growth; SMS Investments S.A.; Dell Technologies Capital	Japan	-	-	-	-
03/10/2020	EWERK Group	Germany	NORD Holding Unternehmensbeteiligungsgesellschaft mbH	Germany	51	-	-	-
02/27/2020	Seal Software Group Limited (93% Stake)	United Kingdom,USA	DocuSign, Inc.	USA	-	-	-	-
02/20/2020	ZeroFox, Inc.	USA	Intel Capital; New Enterprise Associates; Highland Capital Partners, LLC; Core Capital	USA	-	-	-	-



## Top M&amp;A Trends in Infrastructure Software

			Partners; Hercules Capital, Inc; Redline Capital Management S.A.						
02/04/2020	Infor, Inc	USA	Koch Equity Development LLC	USA	12,710	-	-	-	-
02/03/2020	Simeio Solutions LLC	USA	ZelnickMedia Corporation	USA	-	-	-	-	-
01/31/2020	CloudGenix Inc.	USA	Palo Alto Networks, Inc.	USA	420	-	-	-	-
01/30/2020	OpsRamp, Inc.	USA	Morgan Stanley Expansion Capital ; Sapphire Ventures, LLC; Hewlett Packard Enterprise Company	USA	-	-	-	-	-
01/22/2020	Loom Systems Ltd.	USA	ServiceNow, Inc.	USA	58	-	-	-	-
01/09/2020	Veeam Software AG	Switzerland	Insight Partners	USA	5,000	-	-	-	-
01/08/2020	AvePoint, Inc.	USA	Goldman Sachs & Co. LLC; TPG Sixth Street Partners	USA	-	-	-	-	-
01/08/2020	Sykio, SARL	France	Medisys SAS	France	-	-	-	-	-
01/07/2020	CMAP Software Limited	United Kingdom	NorthEdge Capital LLP	United Kingdom	-	-	-	-	-
01/07/2020	Iptor Supply Chain Systems AB	Sweden	Bregal Unternehmerkapital GmbH	Germany	-	-	-	-	-
01/07/2020	JHC Technology, Inc.	USA	Effectual, Inc.	USA	-	-	-	-	-
01/07/2020	Symantec Corporation (Enterprise Security Business)	USA	Accenture Plc	Ireland (Republic)	-	-	-	-	-
01/06/2020	BigID, Inc.	Israel,USA	Tiger Global Management	USA	-	-	-	-	-
12/20/2019	Hangzhou Daishu Technology Co., Ltd.	China	SDIC (Ningbo) Venture Capital Fund Partnership (Limited Partnership)	China	-	-	-	-	-
12/20/2019	Kod Bezopasnosti OOO (84.15% Stake)	Russia	Lanit Group	Russia	-	-	-	-	-
12/18/2019	Streamline Health Solutions, Inc. (Enterprise Content Management business)	USA	Hyland Software, Inc.	USA	13	-	-	-	-
12/18/2019	Maven Wave Partners LLC	USA	Atos SE	France	-	-	-	-	-
12/17/2019	NASSTAR PLC	United Kingdom	GCI Managed Services Group Limited	United Kingdom	95	2.79	-	-	13.73
12/17/2019	LogMeIn, Inc.	USA	LogMeIn Consortium	USA	4,261	3.54	49.53	-	11.01
12/13/2019	Clarity Solutions Group LLC	USA	Accenture Plc	Ireland (Republic)	-	-	-	-	-
12/5/2019	Streem, Inc.	USA	Frontdoor, Inc	USA	-	-	-	-	-
12/3/2019	Flux7 Labs	USA	NTT DATA Corporation	Japan	-	-	-	-	-
11/28/2019	Tenglong Holding Group	China	WL Ross & Co.; China Nanshan Development Group Co., Ltd.; Morgan Stanley Private Equity; Huaneng Invesco WLR Investment Consulting Company Ltd; Kaiyuan (Beijing) Urban Development Fund Management Co., Ltd.; Haitong UniTrust International Leasing Co., Ltd.	Hong Kong SAR	-	-	-	-	-
11/25/2019	Aporeto, Inc.	USA	Palo Alto Networks, Inc.	USA	Not available	-	-	-	-
11/21/2019	Automation Anywhere, Inc.	USA	Goldman Sachs (private equity operations); Salesforce Ventures ; SoftBank Vision Fund L.P.	USA	6,800	-	-	-	-
11/19/2019	Clumio, Inc.	USA	Index Ventures; Sutter Hill Ventures; Altimeter Capital	USA	-	-	-	-	-
11/19/2019	N-Dimension Limited (70% Stake)	Hong Kong SAR	Zhuang Xiaojie (Private investor)	Hong Kong SAR	-	-	-	-	-
11/18/2019	EasyStack Inc.	China	China Electronic Systems Engineering Corp.	China	-	-	-	-	-
11/18/2019	CloudSimple, Inc.	USA	Google LLC	USA	-	-	-	-	-

## Top M&amp;A Trends in Infrastructure Software

11/8/2019	JEMS	France	Pechel Industries Partenaires; Omnes Capital	France	-	-	-	-
11/7/2019	SnapRoute, Inc.	USA	Infoblox Inc.	USA	-	-	-	-
11/5/2019	2Keys Corporation	Canada	Interac Corp.	Canada	-	-	-	-
11/4/2019	Scout RFP Inc.	USA	Workday, Inc.	USA	540	-	-	-
11/2/2019	Fujian Minbao Information Technology Co., Ltd. (71.26% Stake)	China	Suzhou Goldengreen Technologies Ltd.	China	-	-	-	-
10/31/2019	IDsManager.com	China	Alibaba Cloud Computing Co., Ltd.	China	-	-	-	-
10/30/2019	Deep3 Software Limited; Next Century Corporation; Linndustries Shielding Specialties LLC	United Kingdom; USA	CACI International Inc	USA	105	-	-	-
10/22/2019	Athena Mortgage Pty. Ltd.	Australia	AustralianSuper; Host-Plus Pty Limited; Square Peg Capital Pty Ltd.; Salesforce Ventures ; AirTree Ventures Pty Limited; NAB Ventures	Australia	-	-	-	-
10/22/2019	Mailjet SAS	France	Mailgun Technologies, Inc	USA	56	3.85	-	-
10/21/2019	Cloud Conformity Inc.	Australia	Trend Micro Incorporated	Japan	Not available	-	-	-
10/18/2019	Continental Broadband Pennsylvania	USA	AMP Capital Investors Limited	Australia	-	-	-	-
10/16/2019	Contino Solutions Limited	United Kingdom	Cognizant Technology Solutions Corporation	USA	-	-	-	-
10/15/2019	Appatura, Inc.	USA	Broadridge Financial Solutions, Inc.	USA	-	-	-	-
10/15/2019	Shearwater Solutions Pty. Ltd.	Australia	CyberCX Pty Ltd.	Australia	-	-	-	-
10/10/2019	2nd Watch, Inc.	USA	Singapore Technologies Telemedia Pte. Ltd.	Singapore	-	-	-	-
10/9/2019	KnowledgeVision Systems Incorporated	USA	OpenExchange, Inc.	USA	-	-	-	-
10/8/2019	ClearCare, Inc.	USA	WellSky	USA	-	-	-	-
9/20/2019	Shanghai Xforceplus Information Technology Co., Ltd.	China	Temasek Holdings Pte. Ltd.; Hillhouse Capital Management, Ltd.; Easternbell (Shanghai) Investment Management Co., Ltd.	Singapore	-	-	-	-
9/17/2019	DataRobot, Inc.	USA	Intel Capital; Meritech Capital Partners; New Enterprise Associates; EDBI Pte Ltd; Tiger Global Management; Sapphire Ventures, LLC; Alliance Bernstein Investment Research & Management; DFJ Growth; World Innovation Lab; Geodesic Capital; Sands Capital Ventures, LLC	USA	-	-	-	-
9/13/2019	Element AI Inc.	Canada	McKinsey & Co; Caisse de Depot et Placement du Quebec; BDC Capital; Government of Quebec; Real Ventures; Hanwha Asset Management Co., Ltd.; Data Collective	Canada	600	-	-	-
9/12/2019	Applied Intuition, Inc.	USA	Kleiner Perkins; General Catalyst Partners; Lux Capital; Andreessen Horowitz LLC; Floodgate Fund; M12; Sozo Ventures, L.L.C.; La Famiglia GmbH	USA	-	-	-	-
9/9/2019	RSD S.A.	Switzerland	Rocket Software, Inc.	USA	-	-	-	-
9/4/2019	Hedvig Inc.	USA	CommVault Systems Inc.	USA	-	-	-	-
9/2/2019	Cunning Ham Limited; Tansley Equipment Limited; Woodland Technology Group Inc.; Laser Lollipop Ltd.	Canada	Squire Mining Limited	Canada	-	-	-	-
9/2/2019	Kallik Limited	United Kingdom	FPE Capital LLP	United Kingdom	-	-	-	-
8/28/2019	Guangzhou Mingcheng Computer Science and	China	SUNA Co., Ltd.	China	-	-	-	-

## Top M&amp;A Trends in Infrastructure Software

	Technology Co., Ltd. (30% Stake)							
8/22/2019	Pivotal Software, Inc. (84.9% Stake)	USA	VMware, Inc.	USA	2,414	3.67	-	-
8/22/2019	Carbon Black, Inc.	USA	VMware, Inc.	USA	Inferred by Mergermarket. Based on an Enterprise value of USD 2.1bn and Implied Equity Value of USD 1.93bn. Carbon Black, Inc 8-K form filed with SEC on 22 August 2019			-
8/21/2019	SignalFx, Inc	USA	Splunk Inc.	USA	Not available	-	73.69	-
8/18/2019	FixStream Networks, Inc.	India,USA	Resolve Systems, LLC	USA	24	4.66	-	-
8/15/2019	Tresys Technology LLC	USA	DC Capital Partners, LLC	USA	-	-	-	-
8/14/2019	Presidio, Inc.	USA	BC Partners Limited	United Kingdom	As of 30 June 2019. Presidio, Inc. 10-K form filed with SEC on 29 August 2019			20.52
8/8/2019	Cognitran Limited	United Kingdom	Snap-on Inc.	USA	31	-	-	-
8/8/2019	NanoSec	USA	McAfee LLC	USA	-	-	-	-
8/7/2019	ClickSoftware Technologies Ltd.	Israel	US-based company engaged in provision of management software and service for customers' company with cloud platform	JPMorgan	1,350	-	-	-
8/5/2019	MD Insider, Inc.	USA	Accolade, Inc.	USA	-	-	-	-
8/5/2019	MapR Technologies, Inc.	USA	Hewlett Packard Enterprise Company	USA	-	-	-	-
7/31/2019	E8 Storage	Israel	Amazon.com, Inc.	USA	-	-	-	-
7/31/2019	Semantix Tecnologia em Sistema de Informacao S.A. (44% Stake)	Brazil	Crescera Investimentos; 2bCapital S.A.	Brazil	-	-	-	-
7/23/2019	MoneyLion, Inc.	USA	Capital One Financial Corporation; Edison Partners; Greenspring Associates, Inc.; MetaBank, Inc.; FinTech Collective, Inc	USA	1,000	-	-	-
7/18/2019	Hangzhou Hanggang Cloud Computing Data Center Co., Ltd.	China	Hangzhou Iron and Steel Co., Ltd.	China	138	-	-	-
7/18/2019	Bitfusion.io, Inc.	USA	VMware, Inc.	USA	Not available	-	-	-
7/18/2019	HighQ Solutions Limited	United Kingdom	Thomson Reuters Corporation	Canada	-	-	-	-
7/17/2019	Wavecell Pte. Ltd	Singapore	8x8, Inc	USA	Not available	-	-	-
7/9/2019	Elastifile Ltd.	Israel,USA	Google LLC	USA	200	-	-	-
7/3/2019	Nordisk Systems, Inc.	USA	Converge Technology Solutions Corp.	Canada	Not available	-	0.44	-
7/2/2019	Ilait AB	Sweden	Miss Group Holdings Limited	United Kingdom	-	-	-	-
6/26/2019	Symmetry Corporation	USA	Secure-24 Intermediate Holdings, Inc.	USA	-	-	-	-
6/26/2019	EnterpriseDB Corporation	USA	Great Hill Partners LLC; Catalyst Investors LP	USA	-	-	-	-
6/25/2019	Sansoro Health, Inc.	USA	Datica Health, Inc.	USA	-	-	-	-
6/20/2019	Matika SpA (60% Stake)	Italy	WIIT S.p.A.	Italy	10	-	-	4.72
6/19/2019	Thoughtonomy Limited	United Kingdom	Blue Prism Group Plc	United Kingdom	101	8.16	-	-
6/13/2019	Avi Networks, Inc.	USA	VMware, Inc.	USA	Not available	-	-	-
6/10/2019	Tableau Software, Inc.	USA	Salesforce.com, Inc.	USA	15,027	13.01	-	-
6/5/2019	VINTEGRIS, S.L.	Spain	Euronovate S.A.	Switzerland	-	-	-	-
6/3/2019	Cooladata Ltd.	Israel	Medallia, Inc.	USA	8	-	-	-

## Top M&amp;A Trends in Infrastructure Software

6/3/2019	Fabula AI Limited	United Kingdom	Twitter, Inc.	USA	56	-	-	-	
5/29/2019	Twistlock Inc.	Israel,USA	Palo Alto Networks, Inc.	USA	375	-	-	-	
5/28/2019	JetStream Software Inc.	USA	Illumina Ventures; Digital Alpha Advisors LLC	USA	-	-	-	-	
5/28/2019	Drawbridge, Inc.	USA	LinkedIn Corporation	USA	-	-	-	-	
5/24/2019	Cloud Academy Inc.	USA	QA Limited	United Kingdom	-	-	-	-	
5/19/2019	Visolit Norway 52 AS	Norway	Visolit AS	Norway	-	-	-	-	
5/19/2019	Netscenario AS	Norway	Visolit AS	Norway	-	-	-	-	
5/17/2019	Column Technologies, Inc.	USA	Acacia Capital	USA	-	-	-	-	
5/17/2019	Cray Inc.	USA	Hewlett Packard Enterprise Company	USA	1,235	2.71	-	-	
5/16/2019	Rollout.io, Inc.	Israel,USA	CloudBees, Inc.	USA	-	-	-	-	
5/16/2019	aixigo AG	Germany	fronttrail Equity Partners GmbH	Switzerland	-	-	-	-	
5/16/2019	Cloudability Inc.	USA	Apptio, Inc.	USA	-	-	-	-	
5/15/2019	BitRock, Inc.	USA	VMware, Inc.	USA	-	-	-	-	
5/14/2019	Link Solutions Group, LLC	USA	AHEAD, LLC	USA	-	-	-	-	
5/13/2019	CivicPlus, Inc.	USA	BV Investment Partners	USA	-	-	-	-	
5/2/2019	Cloudflight Holding GmbH	Germany	Deutsche Beteiligungs AG	Germany	-	-	-	-	
4/17/2019	Electric Cloud, Inc.	USA	CloudBees, Inc.	USA	-	-	-	-	
4/11/2019	Affectiva, Inc.	USA	CAC Holdings Corporation; Aptiv PLC ; Trend Forward Capital Management, LLC; Motley Fool Ventures, LLC	United Kingdom	Not available	-	-	-	
4/3/2019	eGlobalTech Inc.	USA	Tetra Tech, Inc.	USA	Not available	-	-	-	
4/1/2019	Mailgun Technologies, Inc	USA	Thoma Bravo, LLC	USA	-	-	-	-	
3/11/2019	NGINX, Inc.	USA	F5 Networks, Inc.	USA	Not available	-	26.23	-	
3/1/2019	ProtectWise, Inc.	USA	Verizon Communications Inc.	USA	-	-	-	-	
2/21/2019	Shippable, Inc.	USA	JFrog Ltd	USA	-	-	-	-	
2/19/2019	Demisto Inc.	Israel,USA	Palo Alto Networks, Inc.	USA	Not available	-	-	-	
2/12/2019	Luminate Security Ltd.	Israel	NortonLifeLock Inc.	USA	Not available	-	-	-	
2/12/2019	ShiftLeft, Inc.	USA	Thomvest Ventures; Mayfield Fund, LLC; Bain Capital Ventures; SineWave Ventures	USA	-	-	-	-	
2/12/2019	Ellie Mae, Inc.	USA	Thoma Bravo, LLC	USA	3,277	6.82	-	-	
2/7/2019	Webroot Inc.	USA	Carbonite Inc	USA	Not available	-	2.87	16.04	
2/5/2019	AetherPal Inc.	India,USA	VMware, Inc.	USA	-	-	-	-	
1/23/2019	Travis CI GmbH	Germany	Idera, Inc.	USA	-	-	-	-	
1/15/2019	Rubrik, Inc.	USA	Greylock Partners; Lightspeed Venture Partners; Institutional Venture Partners; Khosla Ventures; Bain Capital Ventures	USA	3,300	-	-	-	
12/24/2018	MINDBODY, Inc.	USA	Vista Equity Partners Management, LLC	USA	Unaudited. As of 30 September 2018. MINDBODY, Inc. 10-Q form filed with SEC on 08 November 2018		-	9.62	-
12/20/2018	DevOps Research and Assessment LLC	USA	Alphabet Inc (parent of Google Inc among others)	USA	-	-	-	-	
12/13/2018	Cloudten Industries Pty Ltd	Australia	Vortiv Ltd	Australia	Not available	-	2.26	-	
12/5/2018	ARCHIBUS, Inc.	USA	JMI Equity	USA	-	-	-	-	

## Top M&amp;A Trends in Infrastructure Software

11/27/2018	NooBaa Ltd.	Israel	Red Hat, Inc.	USA	Not available	-	-	-
11/6/2018	Heptio, Inc.	USA	VMware, Inc.	USA	Not available	-	-	-
11/1/2018	HashiCorp, Inc.	USA	Redpoint Ventures; GGV Capital; Bessemer Venture Partners; Mayfield Fund, LLC; Institutional Venture Partners; True Ventures	USA	1,900	-	-	-
10/28/2018	Red Hat, Inc.	USA	IBM Corporation	USA	As of 31 August 2018. Unaudited. Net cash. Including restricted cash. Red Hat, Inc. 10-Q form filed with SEC on 09 October 2018	-	11.15	68.91
10/15/2018	SendGrid, Inc.	USA	Twilio, Inc.	USA	Unaudited. As of 30 June 2018. SendGrid, Inc. 10-Q form filed with SEC on 31 July 2018	-	13.83	-
10/10/2018	Imperva Inc.	Israel,USA	Thoma Bravo, LLC	USA	1,750	5.44	-	-
10/8/2018	Rocket Software, Inc.	USA	Bain Capital, LP.	USA	2,000	-	-	-
10/3/2018	Hortonworks, Inc.	USA	Cloudera, Inc.	USA	Unaudited. As of 30 June 2018. Hortonworks, Inc. form 10-Q filed with SEC on 09 August 2018	-	6.81	-
10/3/2018	RedLock Inc.	USA	Palo Alto Networks, Inc.	USA	173	-	-	-
8/27/2018	CloudHealth Technologies, Inc.	USA	VMware, Inc.	USA	Not available	-	-	-
7/11/2018	CA Technologies	USA	Broadcom Inc.	USA	17,917	4.23	16.01	11.97
7/10/2018	Avecto Limited	United Kingdom	BeyondTrust Corporation	USA	-	-	-	-
7/2/2018	VMware, Inc. (tracking stock)	USA	Dell Technologies Inc	USA	20,996	2.67	14.29	10.32
7/2/2018	SUSE Linux GmbH	Germany	EQT Partners AB	Sweden	2,535	-	-	-
6/21/2018	Simility, Inc. (97% Stake)	USA	PayPal Holdings, Inc.	USA	-	-	-	-
6/4/2018	GitHub Inc.	USA	Microsoft Corporation	USA	Not available	-	-	-
4/9/2018	SourceClear, Inc.	USA	CA Technologies	USA	25	-	-	-
3/20/2018	MuleSoft, Inc.	USA	Salesforce.com, Inc.	USA	As of 31 December 2017. Including restricted cash. MuleSoft, Inc. 10-K form filed with SEC on 22 February 2018	-	19.92	-
3/14/2018	Evident.io, Inc.	USA	Palo Alto Networks, Inc.	USA	Not available	-	-	-
3/12/2018	Netsil, Inc.	USA	Nutanix, Inc.	USA	Not available	-	-	-
3/12/2018	Booker Software, Inc.	USA	MINDBODY, Inc.	USA	150	6.00	-	-
3/1/2018	Minjar Cloud Solutions Pvt Ltd	India	Nutanix, Inc.	USA	Not available	-	-	-
2/22/2018	CloudVelox, Inc.	USA	VMware, Inc.	USA	-	-	-	-
2/15/2018	Bulletproof Group Limited	Australia	AC3 Limited	Australia	As of 31 December 2017. BulletProof Group Limited stock exchange announcement, 15 February 2018	-	0.55	-
2/1/2018	Madumbo	France	Datadog, Inc.	USA	-	-	-	-
1/30/2018	CoreOS, Inc.	USA	Red Hat, Inc.	USA	Not available	-	-	-
1/23/2018	Sqrrl Data, Inc.	USA	Amazon.com, Inc.	USA	-	-	-	-
1/18/2018	Ledger SAS	France	FirstMark Capital, LLC; Draper Esprit PLC; CapHorn Invest; Digital Currency Group Inc.; Cathay Innovation SAS; Korelya Capital SAS; G.D.Tre SAS; Draper Venture Network	United Kingdom	-	-	-	-
1/14/2018	TSO Logic Inc.	Canada	Amazon Web Services, Inc.	USA	-	-	-	-

## Top M&amp;A Trends in Infrastructure Software

1/5/2018	ScaleArc, Inc.	USA	ESW Capital, LLC	USA	-	-	-	-
1/3/2018	Avere Systems, Inc.	USA	Microsoft Corporation	USA	-	-	-	-
12/11/2017	ShieldX Networks, Inc.	USA	Dimension Data Holdings plc; Bain Capital Ventures; FireEye Inc.; Aspect Ventures; Ashar Aziz (Private Investor); Symantec Ventures	USA	-	-	-	-
12/7/2017	CmpuTe.io	India	Cisco Systems, Inc.	USA	-	-	-	-
10/3/2017	Body Labs, Inc.	USA	Amazon.com, Inc.	USA	50	-	-	-
9/7/2017	Fast Forward Labs, Inc.	USA	Cloudera, Inc.	USA	-	-	-	-
9/5/2017	Cloud Technology Partners, Inc.	USA	Hewlett Packard Enterprise Company	USA	-	-	-	-
8/31/2017	Cyphort Inc.	USA	Juniper Networks, Inc.	USA	34	-	-	-
8/28/2017	MaxPoint Interactive, Inc.	USA	Harland Clarke Holdings Corp.	USA	102	0.68	-	-
8/17/2017	Personal, Inc.	USA	digi.me Limited	United Kingdom	-	-	-	-
8/11/2017	RemitDATA Inc.	USA	eSolutions, Inc.	USA	-	-	-	-
7/31/2017	Permabit Technology Corporation	USA	Red Hat, Inc.	USA	Not available	-	-	-
7/11/2017	Endeavor Commerce Inc.	USA	Vendavo, Inc.	USA	-	-	-	-
6/29/2017	Cloudyn Software Ltd.	Israel,USA	Microsoft Corporation	USA	Not available	-	-	-
5/25/2017	Codenvy S.A.	USA	Red Hat, Inc.	USA	Not available	-	-	-
5/9/2017	etouches, Inc.	USA	Connecticut Innovations, Inc. ; The Argentum Group; Greycroft Partners LLC; HGGC, LLC; Level Equity Management, LLC; Cava Capital; First Analysis Corporation	USA	-	-	-	-
4/3/2017	OpenQ Inc.	USA	Anju Software, Inc.	USA	-	-	-	-
3/23/2017	Zenreach Inc.	USA	First Round Capital; The Founders Fund; Bain Capital Ventures; SV Angel; Ashton Kutcher (Private Investor); 8VC; Maverick Ventures Israel; Kevin Durant (Private Investor)	USA	-	-	-	-
2/9/2017	mCarbon Tech Innovation Pvt. Ltd.	India	Nuance Communications, Inc.	USA	36	2.80	8.51	8.03
2/8/2017	Invincea, Inc.	USA	Sophos Group Plc	United Kingdom	120	8.96	-	-
1/23/2017	Cloud Cruiser, Inc	USA	Hewlett Packard Enterprise Company	USA	-	-	-	-
1/3/2017	Floored, Inc.	USA	CBRE Group, Inc.	USA	-	-	-	-
12/19/2016	Grid Dynamics International, Inc.	USA	Automated Systems Holdings Limited	Hong Kong	118	2.97	-	-
12/14/2016	Logicworks Corporation	USA	Pamplona Capital Management LLP	United Kingdom	135	-	-	-
12/6/2016	InAuth, Inc.	United Kingdom,USA	American Express Company	USA	-	-	-	-
12/5/2016	Radiate Media, LLC	USA	GTN Limited	Australia	15	-	-	-
10/26/2016	Hippo B.V.	Netherlands,USA	BloomReach, Inc.	USA	-	-	-	-
10/25/2016	Dataiku SA	France	FirstMark Capital, LLC; Alven Capital Partners SA; Serena Capital	USA	-	-	-	-
9/15/2016	tcp cloud, a.s.	Czech Republic	Mirantis, Inc.	USA	30	-	-	-
8/31/2016	Quatris, LLC	USA	Seaport Capital, LLC	USA	-	-	-	-
8/1/2016	RJMetrics Inc.	USA	Magento, Inc.	USA	-	-	-	-
7/19/2016	Enservio	USA	Solera Holdings, Inc.	USA	-	-	-	-
7/14/2016	Cloud9 IDE, Inc.	Netherlands,USA	Amazon Web Services, Inc.	USA	-	-	-	-



## Top M&amp;A Trends in Infrastructure Software

6/22/2016	3scale, Inc.	USA	Red Hat, Inc.	USA	Not available	-	-	-
6/15/2016	Joyent, Inc.	USA	Samsung Electronics Co., Ltd.	South Korea	-	-	-	-
6/13/2016	MedHOK, Inc.	USA	Hearst Communications Inc.	USA	-	-	-	-
5/25/2016	Privacy Analytics Inc.	Canada	IMS Health Holdings, Inc.	USA	-	-	-	-
3/21/2016	Serena Software, Inc.	USA	Micro Focus International Plc	United Kingdom	540	-	-	-
2/8/2016	Transera Communications, Inc.	USA	BroadSoft, Inc.	USA	20	-	-	-
1/26/2016	BTI Systems Inc. (88% Stake)	Canada	Juniper Networks, Inc.	USA	63	-	-	-
1/25/2016	China Standard Software Co., Ltd. (50% Stake)	China	Yilan Technology (Beijing) Co., Ltd.	China	-	-	-	-
1/17/2016	Appcelerator Inc.	USA	Axway Software S.A.	France	-	-	-	-
12/14/2015	PrismTech Group Limited	United Kingdom	ADLINK Technology, Inc.	Taiwan	17	2.11	-	-
12/10/2015	Trustev Limited	Ireland (Republic)	TransUnion LLC	USA	21	-	-	-
12/8/2015	Clearleap, Inc.	USA	IBM Corporation	USA	-	-	-	-
10/20/2015	Net Access, LLC	USA	Cologix, Inc.	USA	-	-	-	-
10/16/2015	Ansible, Inc.	USA	Red Hat, Inc.	USA	Not available	-	-	-
9/29/2015	MediaCore Technologies Inc.	Canada	Workday, Inc.	USA	24	-	-	-
9/8/2015	Airvana, Inc.	USA	CommScope Holding Company, Inc.	USA	45	-	-	-
9/2/2015	MedeAnalytics, Inc.	USA	Thoma Bravo, LLC	USA	-	-	-	-
8/25/2015	Onyara, Inc.	USA	Hortonworks, Inc.	USA	Not available	-	-	-
8/13/2015	White Sky Inc.	USA	Intersections, Inc.	USA	-	-	-	-
8/11/2015	Merchantry, Inc.	USA	Tradecraft Inc.	USA	30	-	-	-
7/23/2015	Compose, Inc.	USA	IBM Corporation	USA	-	-	-	-
7/22/2015	#HERE	Finland,USA	BMW AG; AUDI AG; Daimler AG	Germany	3,043	2.89	-	-
6/30/2015	Chrome River Technologies, Inc.	USA	Great Hill Partners LLC	USA	-	-	-	-
6/23/2015	Orga Systems GmbH	Germany	Redknee Solutions Inc	Canada	43	0.63	-	-
6/4/2015	ShoreGroup, Inc.	USA	Francisco Partners IV, L.P.	USA	-	-	-	-
4/28/2015	Continuum Performance Systems, Inc.	USA	MedHOK, Inc.	USA	-	-	-	-
4/28/2015	SureWaves MediaTech Pvt Ltd; Matrimony.com Limited; Equitas Micro Finance India Pvt Ltd; iYogi Limited; Naaptol Online Shopping Pvt Ltd.; Happiest Minds Technologies Private Limited; MXC Solutions India Private Limited; Loyty Rewardz Management Pvt. Ltd.; India Property Online Pvt. Ltd.; mCarbon Tech Innovation Pvt. Ltd.	India;	J.P. Morgan Asset Management	USA	-	-	-	-
4/13/2015	SequenceIQ Inc.	Hungary	Hortonworks, Inc.	USA	Not available	-	-	-
2/3/2015	Xplain.io	USA	Cloudera, Inc.	USA	-	-	-	-
1/13/2015	Greenphire, Inc.	USA	The Riverside Company	USA	-	-	-	-

Top M&A Trends in Infrastructure Software

10/1/2014	DataPad Inc.	USA	Cloudera, Inc.	USA	-	-	-	-
6/3/2014	Gazzang, Inc.	USA	Cloudera, Inc.	USA	-	-	-	-
5/15/2014	XA Secure	USA	Hortonworks, Inc.	USA	Not available	-	-	-
					-	-	-	-

1st Quartile	2.7x	12.8x	9.2x
Min	0.6x	8.5x	4.7x
Mean	4.1x	22.1x	10.6x
Median	3.3x	15.2x	11.0x
3rd Quartile	5.2x	24.4x	12.9x
Max	13.0x	49.5x	14.6x

## 5.4 M&amp;A Comparables – DevOps

Announced Date	Target Company	Target Country	Bidder Company	Bidder Dominant Country	Enterprise Value (\$MM)	EV/Revenue (x)	EV/EBIT (x)	EV/EBITDA (x)
06/17/2020	Productora de Software S.A.S	Colombia	Perficient, Inc.	USA	93	2.8	-	-
06/03/2020	Five Talent Software, Inc	USA	Effectual, Inc.	USA	-	-	-	-
05/25/2020	Cutaway S.r.l.	Italy	Fastweb S.p.A	Italy	9	-	-	-
05/18/2020	Darwin CX Inc.	Canada	Irish Studio Media Publishing Ltd	USA	5	-	-	-
05/14/2020	Metaswitch Networks Limited	United Kingdom	Microsoft Corporation	USA	-	-	-	-
05/13/2020	SWM Co., Ltd.	South Korea	Shinhan 4th Special Purpose Acquisition Co., Ltd.	South Korea	75	6.0	-	-
05/13/2020	Octarine, Inc	USA	VMware, Inc.	USA	-	-	-	-
04/30/2020	incapptic Connect GmbH	Germany	MobileIron, Inc.	USA	6	-	-	-
04/14/2020	SuperOffice AS	Norway	Axcel Management A/S	Denmark	98	-	-	-
03/16/2020	HashiCorp, Inc.	USA	T. Rowe Price Associates, Inc.; Franklin Resources, Inc. ; Redpoint Ventures; GGV Capital; Mayfield Fund, LLC; Institutional Venture Partners; True Ventures; Geodesic Capital	USA	5,100	-	-	-
03/02/2020	Compuware Corporation	USA	BMC Software, Inc.	USA	1,500	-	-	12.5
03/02/2020	ProShip Inc.	USA	Fog Software Group	USA	15	-	-	-
02/24/2020	Zen3 Infosolutions Private Limited	Canada,India,Ireland(Republic), USA	Tech Mahindra Limited	India	39	-	-	-
02/20/2020	TAS Tecnologia Avanzata dei Sistemi S.p.A. (29.79% Stake)	Italy	GUM International s.r.l.; CLP S.r.l	Italy	176	-	-	-
02/08/2020	Scape Technologies Ltd	United Kingdom	Facebook, Inc.	USA	-	-	-	-
02/05/2020	Tekzenit, Inc.	USA	CSG Systems International Inc	USA	10	-	-	-
01/30/2020	Mamezou Holdings Co., Ltd. (88.67% Stake)	Japan	Integral Corporation	Japan	279	1.2	12.6	11.1
01/27/2020	Blackstone Federal	USA	ASGN Incorporated	USA	85	1.9	-	-
01/22/2020	Sysdig, Inc.	USA	Goldman Sachs & Co. LLC; Accel; Insight Partners; Bain Capital Ventures; Glynn Capital Management	USA	-	-	-	-
01/21/2020	XebiaLabs, Inc.	USA	CollabNet, Inc.	USA	-	-	-	-
01/14/2020	SolveBot, Inc	USA	Google LLC	USA	-	-	-	-
11/18/2019	Sonatype, Inc.	USA	Vista Equity Partners Management, LLC	USA	-	-	-	-
10/16/2019	Contino Solutions Limited	United Kingdom	Cognizant Technology Solutions Corporation	USA	-	-	-	-
9/4/2019	CollabNet, Inc.	USA	TPG Capital LP	USA	-	-	-	-
8/22/2019	Pivotal Software, Inc. (84.9% Stake)	USA	VMware, Inc.	USA	2,414	3.67	-	-
8/6/2019	HCL Insys Pte Ltd	India,Singapore	PCCW Solutions Limited	Hong Kong SAR	30	-	-	-
5/24/2019	Cloud Academy Inc.	USA	QA Limited	United Kingdom	-	-	-	-
5/20/2019	Praqma A/S (70% Stake)	Denmark,Norway,Sweden	Eficode Oy	Finland	-	-	-	-
5/16/2019	Cloudability Inc.	USA	Apptio, Inc.	USA	-	-	-	-
4/17/2019	Electric Cloud, Inc.	USA	CloudBees, Inc.	USA	-	-	-	-
3/11/2019	NGINX, Inc.	USA	F5 Networks, Inc.	USA	670	26.23	-	-
2/21/2019	Shippable, Inc.	USA	JFrog Ltd	USA	-	-	-	-

## Top M&amp;A Trends in Infrastructure Software

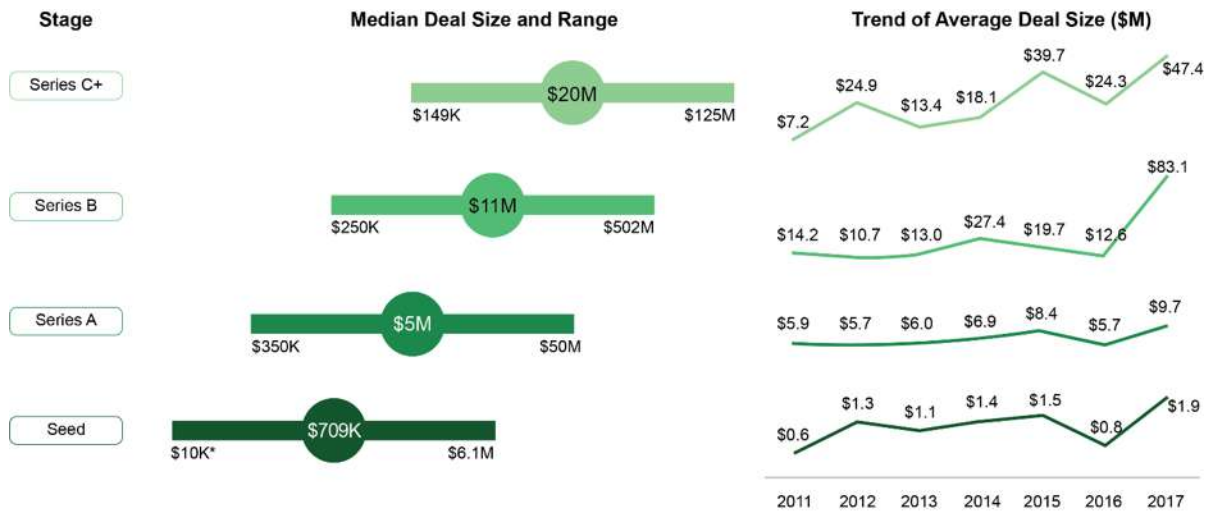
1/22/2019	Rogue Wave Software, Inc.	USA	Perforce Software, Inc.	USA	-	-	-	-
12/18/2018	LANSA Inc	USA	Idera, Inc.	USA	-	-	-	-
11/8/2018	Stelligent Systems LLC	USA	Mphasis Limited	India	25	-	-	-
11/6/2018	Heptio, Inc.	USA	VMware, Inc.	USA	550	-	-	-
10/8/2018	Perfecto Mobile, Inc.	Israel,USA	Perforce Software, Inc.	USA	200	-	-	-
9/28/2018	Built.io LLC	India,USA	Software AG	Germany	-	-	-	-
9/25/2018	Contino Solutions Limited	United Kingdom	Columbia Capital; Top Tier Capital Partners, LLC	USA	-	-	-	-
9/17/2018	StackPointCloud, Inc.	USA	NetApp, Inc.	USA	-	-	-	-
8/26/2018	TriNimbus Technologies Inc.	Canada	Onica Group LLC	USA	-	-	-	-
8/1/2018	Mendix Inc.	USA	Siemens AG	Germany	701	-	-	-
8/1/2018	Vala Group Oy (60% Stake)	Finland	Silli Solutions Oy	Finland	-	-	-	-
7/11/2018	CA Technologies	USA	Broadcom Inc.	USA	17,917	4.23	16.0	12.0
6/20/2018	QASymphony LLC	USA	Tricentis GmbH	Austria	-	-	-	-
6/11/2018	VictorOps Inc.	USA	Splunk Inc.	USA	112	-	-	-
6/4/2018	GitHub Inc.	USA	Microsoft Corporation	USA	7,500	-	-	-
5/9/2018	Hiptest SAS	France,USA	SmartBear Software Inc.	USA	-	-	-	-
4/17/2018	LogicMonitor Inc.	USA	Vista Equity Partners Management, LLC	USA	-	-	-	-
4/11/2018	Nebulr	Australia	Contino Solutions Limited	United Kingdom	-	-	-	-
9/18/2017	InfoZen, LLC	USA	ManTech International Corporation	USA	184	1.84	-	-
6/26/2017	Cloudmunch Inc	USA	JFrog Ltd	Israel	-	-	-	-
5/17/2017	Pingdom Server Monitor	USA	SolarWinds Worldwide, LLC	USA	-	-	-	-
3/6/2017	Veracode, Inc.	USA	CA Technologies	USA	614	-	-	-
6/16/2016	LogicMonitor Inc.	USA	Providence Strategic Growth Capital Partners LLC	USA	-	-	-	-
5/5/2016	Pivotal Software, Inc. (9.03% Stake)	USA	A consortium led by Ford Motor Company	USA	2,800	23.85	-	-
3/2/2016	erwin, Inc.	USA	Parallax Capital Partners, LLC	USA	50	-	-	-
11/25/2015	Contino Solutions Limited	United Kingdom	Sendachi Holdings, Inc.	USA	-	-	-	-
7/29/2015	GitHub Inc. (12.5% Stake)	USA	Sequoia Capital; Institutional Venture Partners; Thrive Capital	USA	-	-	-	-
6/11/2015	AppliedTrust Engineering, Inc.	USA	ViaWest, Inc.	Canada	7	-	-	-
3/13/2014	erwin, Inc.	USA	Embarcadero Technologies, Inc.	USA	-	-	-	-
2/13/2014	Carbon Black, Inc.	USA	Carbon Black, Inc.	USA	40	-	-	-
1/23/2014	Mendix Inc.	USA	Battery Ventures LP	Netherlands	-	-	-	-
11/7/2005	Action Corporation	USA	Garnett & Helfrich Capital	USA	-	-	-	-

<b>1st Quartile</b>	<b>2.1x</b>	<b>11.0x</b>	<b>10.1x</b>
<b>Min</b>	<b>1.2x</b>	<b>9.4x</b>	<b>7.0x</b>
<b>Mean</b>	<b>7.4x</b>	<b>12.7x</b>	<b>10.7x</b>
<b>Median</b>	<b>3.2x</b>	<b>12.6x</b>	<b>11.5x</b>
<b>3rd Quartile</b>	<b>5.6x</b>	<b>14.3x</b>	<b>12.1x</b>
<b>Max</b>	<b>26.2x</b>	<b>16.0x</b>	<b>12.5x</b>

# 6

## Private Placement Comparables

### Median and Average Deal Size in \$MM (per Stage) in Cloud Infrastructure; 2011-2017



### Most Active Investors (VC, PE) by Stage in Cloud Infrastructure; Last 6 years (Sep 2013-Dec 2019)

SEED STAGE		EARLY STAGE		LATE STAGE	
1	<b>.406 Ventures</b> (4 investments) Trilio Data, Randori, Threat Stock, Jisto	1	<b>Intel Capital</b> (3 investments) Stratoscale, Spotinst, Velostrata	1	<b>Accel Partners</b> (8 Investments) Celonis, Corelight, Trifacta, TrustArc, Vectra, Tessian, Netskope, Illumio
2	<b>SV Angel</b> (5 Investments) Koan, Evervault, Sia, Mesosphere, Bowery	2	<b>Andreessen Horowitz</b> (5 Investments) Very Good Security, SentiLink, DigitalOcean, Improbable, Bracket computing	2	<b>Sapphire Ventures</b> (7 Investments) ThoughtSpot, Matillion, Exabeam, PubNub, Portworx, Netskope, CloudHealth Tech
3	<b>Birchmere Ventures</b> (3 Investments) SIEMonster, OneKloud, SubCentral	3	<b>Battery Ventures</b> (9 Investments) Clearbit, HyperScience, Workato, Paperspace, VNDLY, Ordr, Stratoscale, Guardicore, Sensu	3	<b>Cisco Investments</b> (7 Investments) Theatro, Exabeam, Portworx, Celeno, Deskera, HyTrust, CloudVex
4	<b>Elron Electronic Industries</b> (2 investments) Sayata Labs, Alcide	4	<b>Bain Capital Ventures</b> (8 Investments) Moveworks, Armory, Moveworks, Scytale.io, TidalScale, Evident.io, Cloudistics, ShieldX Networks	4	<b>Meritech Capital Partners</b> (6 Investments) Tray.io, Yubico, Ionic Security, Snowflake, CloudHealth Tech, CloudPassage
5	<b>Andreessen Horowitz</b> (2 investments) Netography, Mesosphere	5	<b>Cisco Investments</b> (4 Investments) Lightbits Labs, Stratoscale, Guardicore, Rstar	5	<b>Lightspeed Venture Partners</b> (7 investments) ThoughtSpot, Exabeam, Aqua Security, Rubrik, Netskope, Numerify, CloudPassage
6	<b>Foundation Capital</b> Mesosphere	6	<b>Formation 8</b> (3 Investments) Illumio, Aviatrix ZeroStack	6	<b>General Catalyst Partners</b> (5 investments) Samsara, Menlo Security, Vade Secure, Contrast Security, SignalFX
7	<b>GV</b> Bowery	7	<b>Insight Venture Partners</b> (7 Investments) VNDLY, Kasten, Armory, Tigera, Mirantis, CloudBolt Software, Snine Software	7	<b>GV</b> CyberGRX, Ionic Security, ThousandEyes, Evident.io
8	<b>August Capital</b> AppFormix	8	<b>Norwest Venture Partners</b> (6 Investments) Celona, SlashNext, Prody, Aporeto, Velostrata, Bracket Computing	8	<b>HLM Venture Partners</b> ClearDATA
9	<b>Storm Ventures</b> NubeliU	9	<b>Redpoint Ventures</b> (2 Investments) HashiCorp, Platform9 Systems	9	<b>Triangle Peak Partners</b> Mesosphere
10	<b>Center for Innovative Technology</b> (3 investments) Hypercube, Plutus Privacy Security, DivvyCloud	10	<b>Bessemer Venture Partners</b> (8 Investments) Zylo, Axonius, Scytale.io, Drivenets, Axonius, Hysolate, Stratoscale, Cloudius Systems	10	<b>Flare Capital Partners</b> ClearDATA

## Top M&amp;A Trends in Infrastructure Software

## 6.1 Infrastructure Software – Private Placement (Public Companies)

Announced Date	Target/Issuer	Total Transaction Value (\$MM)	Buyers/Investors	Round Type
4/16/2020	HealthSpace Data Systems Ltd. (CNSX:HS)	2.0	-	PIPE
12/24/2019	HealthSpace Data Systems Ltd. (CNSX:HS)	0.3	-	PIPE
12/16/2019	ChinaCache International (OTCPK:CCIH.Y)	10.0	Alpha Startups	PIPE
07/17/19	FusionData Co.,Ltd (KOSDAQ:A195440)	2.1	Kbiz Win Co.,Ltd.	PIPE
07/10/19	FusionData Co.,Ltd (KOSDAQ:A195440)	2.3	SMC Holdings Co., Ltd.	PIPE
06/05/19	Namu Tech Co.,Ltd. (KOSDAQ:A242040)	12.7	-	PIPE
05/23/19	Napatech A/S (OB:NAPA)	8.7	-	PIPE
05/15/19	TPT Global Tech, Inc. (OTCPK:TPTW)	0.1	Geneva Roth Remark Holdings, Inc.	PIPE
05/09/19	Inspirisys Solutions Limited (BSE:532774)	4.6	CAC Holdings Corporation (TSE:4725)	PIPE
04/08/19	5G Networks Limited (ASX:5GN)	5.7	-	PIPE
03/18/19	TPT Global Tech, Inc. (OTCPK:TPTW)	0.6	Auctus Fund Management, LLC	PIPE
02/20/19	Field Solutions Holdings Limited (ASX:FSG)	0.9	Kestrel Growth Companies Limited	PIPE
02/18/19	EASY SOFTWARE AG (XTRA:ESY)	5.7	-	PIPE
11/28/18	salesforce.com, inc. (NYSE:CRM)	-	ServiceMaster Global Holdings, Inc. (NYSE:SERV)	PIPE
11/09/18	VIQ Solutions Inc. (TSXV:VQS)	17.5	Crown Capital Partners Inc. (TSX:CRWN)	PIPE
08/17/18	5G Networks Limited (ASX:5GN)	0.5	-	PIPE
<b>06/29/18</b>	<b>Fastly, Inc. (NYSE:FSLY)</b>	<b>40.0</b>	<b>Deutsche Telekom Capital Partners Management GmbH; Sozo Ventures; Swisscom Ventures</b>	<b>Series F</b>
06/06/18	TPT Global Tech, Inc. (OTCPK:TPTW)	0.6	-	PIPE
05/04/18	Katapult Technology Corp. (TSXV:FUND)	2.4	-	PIPE
01/31/18	ZTE Corporation (SZSE:000063)	2,067.6	-	PIPE
03/27/17	Cerebra Integrated Technologies Limited (BSE:532413)	7.4	-	PIPE
03/02/17	Dynacons Systems & Solutions Limited (BSE:532365)	0.4	Trigem InfoSolutions Ltd.	PIPE
02/28/17	Gawk Incorporated (OTCPK:GAWK)	7.0	GHS Investments, LLC	PIPE
11/14/16	Fusion Telecommunications International, Inc.	2.8	-	PIPE
06/12/16	Symantec Corporation (NasdaqGS:SYMC)	1,250.0	Bain Capital Private Equity, LP; Silver Lake Buyer Funds: Bain Capital Europe Fund IV, L.P.; Bain Capital Fund XI, L.P.	PIPE



## Top M&amp;A Trends in Infrastructure Software

04/21/16	Pivotal Software, Inc. (NYSE:PVTL)	253.0	General Electric Company (NYSE:GE); VMware, Inc. (NYSE:VMW); EMC Corporation (nka:Dell EMC); Ford Motor Company (NYSE:F); Microsoft Corporation (NasdaqGS:MSFT)	Series C
09/30/15	Pure Storage, Inc. (NYSE:PSTG)	-	Firsthand Capital Management, Inc.; Firsthand Technology Value Fund, Inc. (NasdaqGS:SVVC)	PIPE
09/08/15	Okta, Inc. (NasdaqGS:OKTA)	75.0	Altimeter Capital Management, LP; Andreessen Horowitz LLC; Glynn Capital Management; Greylock Partners; Khosla Ventures; Sequoia Capital	Growth
06/05/15	Nutanix, Inc. (NasdaqGS:NTNX)	-	Firsthand Capital Management, Inc.; Firsthand Technology Value Fund, Inc. (NasdaqGS:SVVC)	Growth
05/26/15	Coupa Software Incorporated (NasdaqGS:COUP)	80.0	Battery Ventures; CrossLink Capital, Inc.; El Dorado Ventures; ICONIQ Capital, LLC; PremjiInvest; Rally Ventures; T. Rowe Price Associates, Inc.	Growth
04/07/15	Gosun Holding Co., Ltd. (SZSE:000971)	113.0	Beijing Yuchi Ruide Investment Co., Ltd.	PIPE
04/01/15	Gawk Incorporated (OTCPK:GAWK)	26.0	Southridge LLC; HEFFX Capital	PIPE
03/31/15	Cloudera, Inc. (NYSE:CLDR)	-	Firsthand Capital Management, Inc.; Firsthand Technology Value Fund, Inc. (NasdaqGS:SVVC)	Growth

## Top M&amp;A Trends in Infrastructure Software

## 6.2 Infrastructure Software – Private Placement (Private Companies)

Announced Date	Target/Issuer	Total Transaction Value (\$MM)	Buyers/Investors	Round Type
06/23/20	Nylas, Inc.	25.0	Spark Capital Partners, LLC; Round 13 Capital, Inc.; Citi Ventures, Inc.; Eight Partners VC, LLC; ScaleUP Ventures; Slack Technologies, Inc., Investment Arm	Series B
06/17/20	Uptycs, Inc.	30.0	Comcast Ventures; Sapphire Ventures, LLC; ForgePoint Capital	Series B
06/17/20	CloudKnox Security Inc	-	Telstra Ventures Pty. Limited	Venture
06/11/20	CloudKnox Security Inc	-	Wipro Ventures Ltd	Venture
06/10/20	Domino Data Lab, Inc.	43.0	Highland Capital Partners; Sequoia Capital Operations LLC; Coatue Management, L.L.C.; Highland Europe (UK) LLP; Dell Technologies Capital	Series E
06/08/20	Savkar, Inc.	0.1	UConn Innovation Fund	Debt
05/27/20	Kentik Technologies, Inc.	23.5	August Capital; Third Point Ventures L.P.; Data Collective; Tahoma Advisors, Inc.; Vistara Capital Partners	Growth
05/13/20	Virtual Instruments Corporation	15.0	Benhamou Global Ventures LLC; HighBar Management, LLC	Growth
05/08/20	DigitalOcean, LLC	50.0	Andreessen Horowitz LLC; Access Industries (uk) Ltd	Series C
05/07/20	Seven Bel GmbH	0.5	eQventure GmbH	Venture
05/06/20	Ermetic Ltd.	10.0	Norwest Venture Partners; Glilot Capital Partners; Target Germanium GmbH	Seed
05/05/20	eNate Limited	2.7	Mercia Fund Management Ltd.; Northern 2 VCT PLC (LSE:NTV); Northern Venture Trust PLC (LSE:NVT); Northern 3 VCT PLC (LSE:NTN)	Growth
04/06/20	Sofico NV	-	Ergon Capital Partners	Growth
03/27/20	Decusoft, LLC	6.5	FINTOP Capital	Series A
03/12/20	Cleanshelf, Inc.	8.0	Dawn Capital LLP; LAUNCHHub	Series A
03/03/20	Compcare Services, LLC	-	The Firmament Group	Growth
03/03/20	HashiCorp, Inc.	175.0	Institutional Venture Partners; Mayfield Fund, LLC; Redpoint Management, LLC; Franklin Resources, Inc. (NYSE:BEN); GGV Capital; T. Rowe Price Global Technology Fund, Inc. (MutualFund:PRGT.X); T. Rowe Price Associates, Inc.; True Ventures; Geodesic Capital	Series E
02/21/20	DisruptOPS Inc.	9.0	Rally Ventures; Drive Capital, LLC	Series A
02/20/20	ZeroFOX, Inc.	74.0	Highland Capital Partners; New Enterprise Associates, Inc.; Core Management II Corporation; Intel Capital; Hercules Capital, Inc. (NYSE:HTGC); Redline Capital Management S.A	Growth
02/13/20	Praetorian Group, Inc.	10.0	McKinsey & Company, Inc.; Bill Wood Ventures	Series A
02/11/20	attenio GmbH	1.2	High-Tech Gründerfonds Management GmbH; Innovationsstarter Hamburg GmbH	Seed
02/11/20	Sixgill Ltd	15.0	REV Venture Partners Limited; Terra Venture Partners; Sonae Investment Management; Elron Ventures; OurCrowd	Series B

## Top M&amp;A Trends in Infrastructure Software

01/30/20	OpsRamp, Inc.	37.5	Sapphire Ventures, LLC; Morgan Stanley Private Equity; Hewlett Packard Pathfinder	Series C
01/27/20	EduChain Inc.	0.1	Techstars Central LLC	Accelerator
01/23/20	CloudKnox Security Inc	12.0	Foundation Capital; ClearSky; Dell Technologies Capital; Sorenson Ventures	Venture
01/21/20	vChain, Inc.	7.0	Elaia Partners; Acequia Capital; Bluwat AG	Series A
01/15/20	Roambee Corporation	15.2	Jebsen & Jessen (GmbH & Co.) KG; Intuitive Venture Partners, LLC; MDI Ventures; PT Telkomsel Mitra Inovasi	Series B
01/13/20	Containous SAS	10.0	Elaia Partners; 360 Capital Partners SAS; Balderton Capital (UK) LLP	Series A
12/20/2019	TriggerMesh Inc.	3.0	Index Ventures SA; Crane Venture Partners LLP	Seed
12/10/2019	IndustrialML, Inc.	2.8	-	Seed
12/06/2019	Beijing Youtejie Information Technology Co., Ltd.	11.4	Sequoia Capital China; Danhua Capital; Beijing CGP Investment Co, Ltd	Series B
11/22/2019	Ridgewall Limited	-	Inflexion Private Equity Partners LLP	Growth
11/21/2019	MontyCloud Inc.	2.9	Madrona Venture Group, LLC; Lytical Ventures, LLC	Seed
10/17/2019	Invoca, Inc.	56.0	Accel Partners; Upfront Ventures; Morgan Stanley Alternative Investment Partners LP; H.I.G. Growth Partners, LLC	Growth
10/16/2019	Evervault Ltd.	3.2	Kleiner Perkins Caufield & Byers; Sequoia Capital; SV Angel; Frontline Ventures Management Company Limited	Seed
10/10/2019	Sunshower.io Corporation	-	-	Debt
07/31/19	Signalwire, Inc.	11.5	Sequoia Capital; Storm Ventures LLC; Samsung NEXT	Series A
07/25/19	Tresorio SAS	0.5	Groupe Deret; Unico Partners SAS	Venture
07/16/19	Innovation & Union Technology Co.,Ltd.	2.9	Peak Valley Capital	Series A
07/11/19	DUST Identity, Inc.	12.4	Kleiner Perkins Caufield & Byers; New Science Ventures, LLC; Airbus Group Ventures; Lockheed Martin Ventures; Castle Island Ventures; Angular Ventures Inc.	Series A
06/14/19	GreatHorn, Inc.	13.3	RRE Ventures LLC; .406 Ventures, LLC; Uncork Capital; Techstars Central LLC; V1.VC	Venture
<b>06/14/19</b>	<b>Druva Inc.</b>	<b>130.0</b>	-	<b>Series B</b>
06/12/19	Orca Security Ltd.	6.5	YL Ventures GP Ltd.	Seed
05/28/19	Beijing Qinhuai Technology Co., Ltd.	570.0	Bain Capital Private Equity, LP	Growth
05/22/19	Sitetracker, Inc.	-	-	Growth
05/17/19	GreatHorn, Inc.	-	-	Venture
05/13/19	replex GmbH	-	CFH Management GmbH; S-Beteiligungen Leipzig; SIB Innovations- und Beteiligungsgesellschaft mbH; High-Tech Gründerfonds Management GmbH; eValue AG; SC-Kapitalbeteiligungsgesellschaft mbH; EnBW New Ventures GmbH	Venture
05/03/19	Aiven Ltd	9.0	Earlybird Venture Capital GmbH & Co. KG; Lifeline Ventures Oy	Series A

## Top M&amp;A Trends in Infrastructure Software

07/24/19	Balena Inc.	14.4	OpenView Venture Partners; GE Ventures, LLC; Aspect Ventures; Stonehearth Ventures	Series B
07/23/19	Arrcus, Inc.	30.0	General Catalyst Partners; Lightspeed Venture Partners; Clear Ventures Management LLC	Series B
07/22/19	WeAreDevelopers GmbH	-	Heise Medien GmbH & Co. KG	Venture
07/18/19	AppViewX, Inc.	30.0	Brighton Park Capital LLC	Series A
06/21/19	Tilkal	4.0	Ventech SA; Breega Capital SARL	Venture
<b>05/23/19</b>	<b>IDERA, Inc.</b>	<b>-</b>	<b>Partners Group Holding AG (SWX: PGHN)</b>	<b>Growth</b>
4/5/2019	Blockdaemon	2.4	Lerer Hippeau	Seed
4/3/2019	Faction	14.0	Dell Technologies Capital, River Cities Capital Funds	Series B
4/1/2019	Pixeom, Inc.	15.0	Intel Capital, National Grid Partners (NGP)	Growth
2/20/2019	K2 Cyber Security, Inc	6.0	Embark Ventures, GreatPoint Ventures	Seed
<b>1/30/2019</b>	<b>Aporeto</b>	<b>20.0</b>	<b>Comcast Ventures</b>	<b>Series B</b>
<b>12/13/2018</b>	<b>Cloudify</b>	<b>7.0</b>	<b>-</b>	<b>Series A</b>
<b>10/2/2018</b>	<b>Nyansa</b>	<b>8.5</b>	<b>Formation 8</b>	<b>Series A</b>
<b>9/12/2018</b>	<b>HyperGrid</b>	<b>25.0</b>	<b>Atlantic Bridge, HighBar Partners</b>	<b>Series C</b>
<b>8/28/2018</b>	<b>Lacework</b>	<b>24.0</b>	<b>Sutter Hill Ventures</b>	<b>Series B</b>
4/11/2018	Blockdaemon	0.4	-	Seed
<b>4/10/2018</b>	<b>StackRox</b>	<b>25.0</b>	<b>Sequoia Capital</b>	<b>Series B</b>
3/6/2018	Blockdaemon	3.3	Comcast Ventures	Seed
<b>2/15/2018</b>	<b>HyperGrid</b>	<b>15.0</b>	<b>Acero Capital, Atlantic Bridge</b>	<b>Series B</b>
<b>2/14/2018</b>	<b>Salt Stack, Inc.</b>	<b>15.5</b>	<b>Mercato Partners</b>	<b>Series A</b>
<b>1/17/2018</b>	<b>Unitas Global</b>	<b>10.0</b>	<b>Boathouse Capital</b>	<b>Series C</b>
<b>1/15/2018</b>	<b>Nyansa</b>	<b>15.0</b>	<b>Intel Capital</b>	<b>Series B</b>
<b>1/9/2018</b>	<b>StackShare, Inc.</b>	<b>5.2</b>	<b>e.ventures</b>	<b>Series A</b>
<b>11/7/2017</b>	<b>NeuVector</b>	<b>7.0</b>	<b>HWVP, Hummer Winblad Venture Partners</b>	<b>Series A</b>
<b>9/19/2017</b>	<b>Capsule8</b>	<b>6.0</b>	<b>Bessemer Venture Partners</b>	<b>Series A</b>
<b>9/13/2017</b>	<b>Heptio</b>	<b>25.0</b>	<b>Madrona Venture Group</b>	<b>Series B</b>
<b>8/8/2017</b>	<b>Capsule8</b>	<b>15.0</b>	<b>ClearSky</b>	<b>Series B</b>
<b>7/18/2017</b>	<b>StackRox</b>	<b>14.0</b>	<b>Sequoia Capital</b>	<b>Series B</b>
<b>6/28/2017</b>	<b>Platform9</b>	<b>22.0</b>	<b>Canvas Ventures</b>	<b>Series C</b>
<b>5/18/2017</b>	<b>Aporeto</b>	<b>11.2</b>	<b>Norwest Venture Partners</b>	<b>Series A</b>
<b>2/22/2017</b>	<b>Diamanti</b>	<b>18.0</b>	<b>Northgate Capital</b>	<b>Series B</b>
<b>1/18/2017</b>	<b>Aviatrix</b>	<b>15.0</b>	<b>CRV</b>	<b>Series B</b>
<b>11/17/2016</b>	<b>Heptio</b>	<b>8.5</b>	<b>Accel</b>	<b>Series A</b>

## Top M&amp;A Trends in Infrastructure Software

10/13/2016	Postman	7.0	Nexus Venture Partners	Series A
8/3/2016	Cloudyn	4.0	Infosys, Viola Ventures	Growth
7/26/2016	Codeship	7.0	Ascent Venture Partners	Series A
6/6/2016	Cloudability	24.0	Founders Fund, Foundry Group	Series B
6/4/2016	StackShare, Inc.	1.5	Cervin Ventures	Seed
5/11/2016	Weaveworks	15.0	GV	Series B
5/9/2016	CoreOS	28.0	GV	Series B
5/6/2016	Rancher Labs	20.0	GRC SinoGreen Fund	Series B
5/5/2016	Observable Networks	2.0	MK Capital	Series B
5/1/2016	HyperGrid	9.0	Acero Capital, Atlantic Bridge, GGV Capital	Series A
4/19/2016	Diamanti	12.5	CRV, DFJ, GSR Ventures	Series A
4/13/2016	CloudEndure	13.0	Dell Technologies Capital	Series B
3/21/2016	CloudEndure	6.0	Infosys, Magma Venture Partners	Series B
2/5/2016	Unitas Global	3.3	-	Series B
1/28/2016	Wercker	4.5	INKEF Capital	Series A
1/9/2016	Scalr	7.5	OpenView Venture Partners	Series A
12/14/2015	Cloudyn	11.0	Infosys, Viola Ventures	Series B
12/9/2015	CloudEndure	7.0	Magma Venture Partners	Series B
10/10/2015	WSO2	20.0	Pacific Systems Control Technology	Growth
8/17/2015	Platform9	10.0	Menlo Ventures	Series A
8/10/2015	Cloudability	6.0	Founders Fund, Foundry Group	Series B
6/30/2015	Cloud Technology Partners	3.5	Oak Investment Partners, Pritzker Group Venture Capital	Series B
6/9/2015	Rancher Labs	10.0	Mayfield Fund, Nexus Venture Partners	Series A
6/4/2015	Zentera	4.9	China Development Industrial Bank (CDIB)	Series A
5/25/2015	Lacework	8.0	-	Series A
4/6/2015	CoreOS	12.0	GV	Series A
2/26/2015	Aviatrix	10.0	-	Series A
2/24/2015	Unitas Global	1.6	-	Series A

## Top M&amp;A Trends in Infrastructure Software

## 6.3 DevOps – Selected Private Placement

Announced Date	Target/Issuer	Total Transaction Value (\$MM)	Buyers/Investors	Round Type
05/28/20	Beijing Deepexi Technology Co., Ltd.	50.0	Lighthouse Capital Partners; IDG Capital Partners; Morningside Venture Capital; Bertelsmann Management (Shanghai) Co., Ltd.; Hillhouse Capital Management, Ltd.; Chuxin Capital Partners Ltd; China Merchants Capital Investment Co., Ltd.; Beijing Sanxia Xintai Investment Fund Management Co., Ltd.	Series A
05/08/20	REVDEBUG SPÓŁKA Z OGRANICZONA ODPOWIEDZIALNOSCIA W LIKWIDACJI	-	Experior Sp. z o.o., Investment Arm; Knowledge Hub Sp. z o.o.	Venture
04/28/20	AsknBid Innovation Factory India Private Limited	-	-	Venture
04/16/20	Hangzhou Fit2Cloud Information Technology Co., Ltd.	2.9	Vision Knight Capital	Series C
03/11/20	StackHawk, Inc.	2.5	Flybridge Capital Partners; Foundry Group LLC; Costanoa Venture Capital; Matchstick Ventures	Seed
03/05/20	AutoRABIT, Inc.	12.5	Full In Venture Partners	Series A
03/02/20	ZeroNorth, Inc.	10.0	CrossLink Capital, Inc.; Rally Ventures; Petrillo Capital; ClearSky	Series A
02/27/20	Sourcegraph, Inc.	23.0	Redpoint Management, LLC; Goldcrest Advisory LLC; Craft Ventures; HNVR Technology Investment Management, LLC; Burst Capital, LLC	Series B
02/05/20	Drifty Co.	6.0	General Catalyst Partners; Arthur Ventures	Growth
01/07/20	Aible, Inc.	14.6	-	Venture
12/24/19	ONES.AI Adventist Shenzhen Technology Co., Ltd.	10.0	Morningside Venture Capital; China Growth Capital; Vision Knight Capital	Series B
12/12/19	Testsigma Technologies, Inc.	0.7	-	Seed
12/10/19	Chengdu Ghostcloud Technology Co., Ltd.	1.4	Sichuan Innovation Development Investment Management Co., Ltd.	Series A
11/15/19	Hangzhou Fit2Cloud Information Technology Co., Ltd.	-	Ether Capital; Delian Capital	Series C
11/11/19	Workato, Inc.	70.0	Battery Ventures; Norwest Venture Partners; Redpoint Management, LLC; Storm Ventures LLC; Geodesic Capital	Series C
10/04/19	Tasktop Technologies, Inc.	-	-	Growth
12/24/2019	ONES.AI Adventist Shenzhen Technology Co., Ltd.	10.0	Morningside Venture Capital; China Growth Capital; Vision Knight Capital	Series B
12/10/2019	Chengdu Ghostcloud Technology Co., Ltd.	1.4	Sichuan Venture Capital	Series A
<b>11/15/2019</b>	<b>Hangzhou Fit2Cloud Information Technology Co., Ltd.</b>	<b>-</b>	<b>Ether Capital; Delian Capital</b>	<b>Series C</b>
<b>11/11/2019</b>	<b>Workato, Inc.</b>	<b>70.0</b>	<b>Battery Ventures; Norwest Venture Partners; Redpoint Ventures; Storm Ventures LLC; Geodesic Capital</b>	<b>Series C</b>
9/24/2019	Beijing Deepexi Technology Co., Ltd.	35.0	IDG Capital Partners; Morningside Venture Capital; Hillhouse Capital Management, Ltd.	Series A
9/10/2019	Sourced Group Inc.	15.2	Comerica Bank, Banking Investments; Round 13 Capital, Inc.; HSBC Holdings plc, Investment Arm	Series A



## Top M&amp;A Trends in Infrastructure Software

<b>8/30/2019</b>	<b>Lacework, Inc.</b>	<b>42.0</b>	<b>Sutter Hill Ventures; Liberty Global Ventures</b>	<b>Venture</b>
8/28/2019	Hound Technology, Inc.	11.4	e.ventures; Scale Venture Partners; Storm Ventures LLC; Next World Capital; Merian Ventures	Series A
7/19/2019	StackHawk, Inc.	2.1	Flybridge Capital Partners; Foundry Group; Costanoa Venture Capital; Matchstick Ventures	Seed
7/17/2019	Ravtech Beit Tochna Torani Ltd	4.0	-	Series A
6/30/2019	Rafay Systems, Inc.	8.0	Ridge Ventures; NTT Docomo Ventures, Inc.; Costanoa Venture Capital; Moment Ventures	Series A
5/29/2019	LogsHero Ltd.	52.0	83North Ltd; Giza Venture Capital; General Catalyst Partners; Greenspring Associates, Inc.; Vintage Investment Partners; OpenView Advisors, LLC; Next47 GmbH	Series D
<b>5/28/2019</b>	<b>SignalFx, Inc.</b>	<b>75.0</b>	<b>Charles River Ventures, Inc.; General Catalyst Partners; Tiger Global Management LLC; Andreessen Horowitz LLC</b>	<b>Series E</b>
5/22/2019	Morpheus Data, LLC	9.2	-	Venture
3/29/2019	Beijing Deepexi Technology Co., Ltd.	3.0	IDG Capital Partners; Hillhouse Capital Management, Ltd.	Pre-Series A
3/28/2019	Cycloid	3.4	Orange Capital SA	Venture
<b>1/7/2019</b>	<b>RackN Inc</b>	<b>-</b>	<b>-</b>	<b>Venture</b>
<b>12/14/2018</b>	<b>Agile Stacks, Inc.</b>	<b>6.0</b>	<b>Canaan Partners; Alumni Ventures Group; Hewlett Packard Pathfinder; Rosecliff Ventures</b>	<b>Series A</b>
<b>12/12/2018</b>	<b>LatticeWorks, Inc</b>	<b>13.0</b>	<b>-</b>	<b>Seed</b>
12/11/2018	Answerbook, Inc.	25.0	Providence Equity Partners L.L.C.; Emergence Capital Partners; Y Combinator Management LLC; Initialized Capital Management	Series B
12/10/2018	UBiqube (Ireland) Limited	0.2	NTT Comware Corporation	Series B
<b>12/5/2018</b>	<b>Workato, Inc.</b>	<b>25.0</b>	<b>Battery Ventures; Storm Ventures LLC; ServiceNow, Inc. (NYSE:NOW); Workday Ventures</b>	<b>Series B</b>
<b>11/27/2018</b>	<b>ZeroNorth, Inc.</b>	<b>10.3</b>	<b>CrossLink Capital, Inc.; Rally Ventures; Petrillo Capital; ClearSky</b>	<b>Series A</b>
11/6/2018	Zilker Technology LLC	-	-	Venture
<b>10/22/2018</b>	<b>Pulumi Corporation</b>	<b>15.0</b>	<b>Madrona Venture Group, LLC; Tola Capital, LLC</b>	<b>Series A</b>
<b>10/18/2018</b>	<b>Pulumi Corporation</b>	<b>15.0</b>	<b>-</b>	<b>Venture</b>
<b>10/17/2018</b>	<b>WhiteSource Software Ltd.</b>	<b>35.0</b>	<b>83North Ltd; Susquehanna Growth Equity, LLC; M12</b>	<b>Series C</b>
10/9/2018	Venafi, Inc.	110.0	Technology Crossover Ventures; QuestMark Partners; NextEquity	Series G
9/30/2018	Green Fox Academy Korlatolt Felelossegu Tarsasag	0.9	Szechenyi Tokealap-kezeko Zrt.	Venture
9/25/2018	Contino LTD	40.0	Columbia Capital, L.P.; Top Tier Capital Partners, LLC	Series B
9/12/2018	ONES.AI Adventist Shenzhen Technology Co., Ltd.	-	Morningside Venture Capital; China Growth Capital	Series A
<b>8/30/2018</b>	<b>StreamSets, Inc.</b>	<b>35.5</b>	<b>Battery Ventures; New Enterprise Associates; Tenaya Capital Inc.; Harmony Partners</b>	<b>Series C</b>
<b>8/15/2018</b>	<b>Twistlock Inc.</b>	<b>33.0</b>	<b>Polaris Partners; YL Ventures GP Ltd.; ICONIQ Capital, LLC; Rally Ventures; Ten Eleven Ventures; Dell Technologies Capital</b>	<b>Series C</b>

## Top M&amp;A Trends in Infrastructure Software

7/31/2018	Ziguang Cloud Co., Ltd	1.7	TSINGHUA UNIGROUP CO., Ltd	Venture
<b>7/11/2018</b>	<b>EasyOps</b>	-	<b>Eight Roads Ventures China; Vertex Ventures</b>	<b>Series B</b>
7/9/2018	Tingent Ab (Publ)	0.7	-	Venture
<b>6/20/2018</b>	<b>CloudBees, Inc.</b>	<b>72.0</b>	<b>Matrix Partners; Lightspeed Venture Partners; Delta-v Capital; Verizon Ventures; HSBC Holdings plc, Investment Arm; Unusual Ventures</b>	<b>Series E</b>
<b>6/14/2018</b>	<b>Pulum Corporation</b>	<b>5.0</b>	<b>Madrona Venture Group, LLC; Tola Capital, LLC</b>	<b>Seed</b>
<b>5/10/2018</b>	<b>SignalFx, Inc.</b>	<b>45.0</b>	<b>Charles River Ventures, Inc.; General Catalyst Partners; Andreessen Horowitz LLC</b>	<b>Series D</b>
<b>3/13/2018</b>	<b>StackFuel GmbH</b>	-	<b>FX Ventures GmbH</b>	<b>Seed</b>
<b>2/20/2018</b>	<b>xMatters, Inc.</b>	<b>40.0</b>	<b>Goldman Sachs Private Capital Investing group</b>	<b>Series D</b>
<b>2/12/2018</b>	<b>XebiaLabs, Inc.</b>	<b>100.0</b>	<b>Accel Partners; Susquehanna Growth Equity, LLC</b>	<b>Series B</b>
1/18/2018	Hound Technology, Inc.	11.5	e.ventures; Storm Ventures LLC; Next World Capital; Merian Ventures	Series A
1/9/2018	StackShare, Inc.	5.2	e.ventures; Cervin Ventures	Series A
12/15/2017	Catalyte, Inc	27.0	Cross Culture Ventures; Rise of the Rest; Expon Capital S.A.R.L.; Palm Drive Capital LLC	Series A
<b>12/14/2017</b>	<b>Agile Stacks, Inc.</b>	<b>3.3</b>	<b>Canaan Partners</b>	<b>Seed</b>
11/27/2017	Reliam, Inc.	-	Great Hill Partners, LP	Venture
11/15/2017	LogsHero Ltd.	23.0	83North Ltd; Giza Venture Capital; Vintage Investment Partners; OpenView Advisors, LLC	Series C
11/6/2017	Answerbook, Inc.	7.0	Initialized Capital Management, LLC	Series A
<b>10/20/2017</b>	<b>Lacework, Inc.</b>	<b>25.6</b>	<b>Sutter Hill Ventures; Liberty Global Ventures; Webb Investment Network; AME Cloud Ventures; Spike Ventures</b>	<b>Series B</b>
10/4/2017	Pensa, Inc.	4.0	March Capital Partners	Series A
9/18/2017	Testing Circle Limited	5.4	Key Capital Partners LLP	Venture
6/12/2017	Beijing Yunify Technology Co., Ltd.	158.9	BlueRun Ventures; China Oceanwide Holdings Group Co.,Ltd; CICC Jia Cheng Investment Management Company Limited; Zhongjin Jiameng (Tianjin) Equity Investment Fund Management Co., Ltd.; Lightspeed China Partners; China Merchants Securities Zhiyuan Hedge Collective Asset Management Plan; Riverhead Capital Investment Management Co., Ltd.; China Merchants Securities International Company Limited	Series D
<b>5/31/2017</b>	<b>StreamSets, Inc.</b>	<b>20.0</b>	<b>Accel Partners; Battery Ventures; New Enterprise Associates</b>	<b>Series B</b>
<b>5/17/2017</b>	<b>QASymphony, Inc.</b>	<b>40.0</b>	<b>Insight Venture Management, LLC</b>	<b>Series C</b>
<b>8/22/2017</b>	<b>Skytap, Inc.</b>	<b>45.0</b>	<b>Insight Venture Management; Madrona Venture Group, LLC; Ignition Partners; Goldman Sachs Private Capital Investing group</b>	<b>Series E</b>
<b>7/18/2017</b>	<b>Workato, Inc.</b>	<b>10.0</b>	<b>Storm Ventures LLC; Salesforce Ventures, Inc.; Workday Ventures</b>	<b>Series A</b>
7/6/2017	Chengdu Ghostcloud Technology Co., Ltd.	1.2	Guangdong Bluedon Investment Management Co., Ltd.	Venture

## Top M&amp;A Trends in Infrastructure Software

6/26/2017	Codemotion srl	1.7	LVenture Group S.p.A. (BIT:LVEN); Invitalia Ventures SGR; Primomiglio SGR SPA	Venture
<b>6/14/2017</b>	<b>WhiteSource Software Ltd.</b>	<b>10.0</b>	<b>83North Ltd; M12</b>	<b>Series B</b>
5/9/2017	UBique (Ireland) Limited	-	Fujitsu Limited (TSE:6702); Fortinet, Inc. (NasdaqGS:FTNT); NTT Docomo Ventures, Inc.	Series A
<b>4/25/2017</b>	<b>Twistlock Inc.</b>	<b>17.0</b>	<b>Polaris Partners; YL Ventures GP Ltd.; Rally Ventures; Ten Eleven Ventures</b>	<b>Series B</b>
<b>3/20/2017</b>	<b>Reduxio Systems Ltd.</b>	<b>22.5</b>	<b>Jerusalem Venture Partners; Viola Ventures; Intel Capital; Seagate Technology plc (NasdaqGS:STX); C5 Capital Ltd</b>	<b>Series C</b>
3/16/2017	LEVVEL LLC	3.0	-	Venture
2/7/2017	SnapRoute, Inc.	25.0	Norwest Venture Partners; AT&T Inc. (NYSE:T); Lightspeed Venture Partners; M12	Series A
1/18/2017	Simplilearn Solutions Private Limited	40.0	-	Series D
<b>12/31/2016</b>	<b>StackShare, Inc.</b>	<b>1.5</b>	<b>Cervin Ventures; Precursor Ventures</b>	<b>Seed</b>
8/18/2016	Ziffity Solutions LLC	-	Aspire Systems, Inc.	Venture
<b>8/11/2016</b>	<b>UpGuard Inc.</b>	<b>17.0</b>	<b>August Capital; Pelion Venture Partners; Insurance Australia Group Limited (ASX:IAG); Valar Ventures LP; Square Peg Capital Pty Ltd.</b>	<b>Series B</b>
7/28/2016	Tandem	4.0	Motorola Solutions Venture Capital	Series A
7/20/2016	Answerbook, Inc.	1.3	Tameres Group; Initialized Capital Management, LLC	Venture
<b>4/7/2015</b>	<b>CliQr Technologies, Inc.</b>	<b>20.0</b>	<b>Foundation Capital; Polaris Partners; TransLink Capital; GV</b>	<b>Series C</b>
3/31/2015	LEVVEL LLC	-	Walnut Grove Holdings, LLC	Venture
2/25/2015	Answerbook, Inc.	0.7	Y Combinator Management LLC; Tameres Group; Kima Ventures	Seed
<b>2/17/2015</b>	<b>LogsHero Ltd.</b>	<b>1.2</b>	<b>Giza Venture Capital</b>	<b>Seed</b>
2/11/2015	ITInvolve, Inc.	1.5	-	Venture
1/20/2015	Simplilearn Solutions Private Limited	15.4	Mayfield Fund; Helion Venture Partners, LLC; Kalaari Capital Advisors Private Limited	Series C
<b>1/15/2015</b>	<b>SignalFx, Inc.</b>	<b>20.0</b>	<b>Charles River Ventures, Inc.; Andreessen Horowitz LLC</b>	<b>Series B</b>

# 7

## Concluding Statements

Since 2006 the IT Sector has been trying to figure out what to do about Public Cloud. In 2019 Public Cloud might have figured out what to do about the IT Sector. Let's unpack that a bit.

In the 13 years of Public Cloud the advantages of using Public Cloud have become very clear, there are also good reasons not to use Public Cloud and this has created 2 technology stacks-one in the Public Cloud generally easy to access and innovating at an incredible rate, and then one trailing behind in the Private Cloud with slightly compromised capabilities. Note the Private Cloud can never match the access to pooled resources that brings many of the advantages of Public Cloud, but data residency, heightened security constraints and access to legacy IT are also things that prevent 70-80% of enterprises from only using Public Cloud.

2019 gave us Kubernetes. Kubernetes and the tech it enables is the key to unifying the Private Cloud and the Public Cloud into just "infrastructure software". Kubernetes is the first step to taking away the constraints of where applications reside, on premise is now rebranded as "Edge" and applications running at the edge will not necessarily reside at the edge. Applications will have components (groupings of containers) that reside all over an IT continuum, there will be no longer be a requirement or need to specify that X application is a cloud application and Y application is an enterprise private cloud application. So, the Public Cloud now extends to the private domain inside enterprise firewalls, we no longer have the have and have not of Public Cloud use. We just have cloud capabilities and they reside everywhere we could want them.

### What does this mean and what does it not mean?

- **It does mean** that new code/applications built on a technology stack in an enterprise using Kubernetes as the foundation, and therefore containers as the unit of mobility of code, will not be constrained to only using local resources but will have access to the full range of capabilities that any cloud offers. And this works the other way around, cloud applications built in the Public Cloud will be executable in the enterprise private cloud.
- **It does not mean** that all legacy applications will suddenly be transported to the cloud and run more efficiently, that will still be on a case by case basis and certainly migration tools will be important going forward. But they will be accessible as services to interface to by other applications on the Kubernetes enabled cloud continuum -initially available to virtual machine based applications via a VMWare solution.

What is going to be important in this future?

1. **Enhancements to containers** - we are not done yet with the scope of possibilities of containers. One pressing requirement is around security and then also around AI especially for container discovery, auto-deployment and use trends. The cloud players will be the most active in this area.

## Top M&A Trends in Infrastructure Software

2. **Enhancements to Container Management** - we are just started with how containers are managed. This is a big problem, as containers are usually micro-components, and so the problem becomes one of scale and control. Again, likely the cloud players the most active.
3. **Kubernetes Management** (such as Google Anthos & Azure Ark) - we have just started the journey of what we will do with Kubernetes and tools that manage Kubernetes. Look for a lot more innovation to appear in this category, especially as it relates to hybrid, edge and multi-cloud. This is an area that caters to new entrants to build on-top of Kubernetes and create a new class leading category.
4. **Cloud migration tools and services** - as the multi-cloud or cloud continuum gains momentum, look for the need to migrate existing legacy to this platform to heat up further. There is still some 60-80% of IT spend locked in legacy systems with the incentive to save on this amount if the code can be moved to cloud. The cloud players will continue to invest in this area, but also will the consultancy groups.
5. **Serverless** - serverless is likely to become the de-facto mechanism to utilize cloud in the near future. It is a very new area so 1 of everything in terms of the surround capabilities of management are needed. Alongside Kubernetes management, it is perhaps the area with the greenest field status, and so look for a large number of companies catering into this area. Certainly, the cloud providers will need to invest here but there is also scope for new entrants to disintermediate in this area and provide an over the top capability.
6. **Zero Code tools** - perhaps the most impactful category. There is already quite a number of companies operating in this sector, we think this sector has room to grow in terms of innovation, but also look for consolidation with all the large players needing a Zero Code capability.
7. **Hybrid Cloud** - still an important category but as a term will likely fade away in favor of edge and multi-cloud.
8. **Multi-Cloud** - being able to move code and applications between the various clouds is a key requirement for enterprise use of cloud (whether they use it or not) so look for service mesh type services to take center stage in this area. This is an area we will see a lot of deals from the Public Cloud providers but also there is scope for new entrants to this market with multi-cloud providing scope for an over the top play.
9. **Edge Cloud** -this is the new market that was just enabled, so look for a substantial amount of innovation and deals in this area, especially for edge deployment. Certainly, the cloud players will be looking to gain differentiation in this area.
10. **5G enabled Use Cases** - 5G is coming. Use cases are very specific. But once 5G is all around us look for those use cases to multiply and with it the need for optimizations for 5G use. This is a very open market currently, with a bit of a wait and see. Look to the telcos and especially their suppliers as the main movers in this market in the short term.

## Who Are Likely Acquirers of Cloud Infrastructure Companies?

When considering Cloud Infrastructure acquisitions, we believe there are four primary categories of relevant acquirers:

1. **Traditional System Management and Platform Vendors:** companies that have been the traditional acquirers of distributed management technologies. Many of these companies have been consolidated or taken private by the robust Private Equity markets which appreciate their significant operating margins.
2. **Next-Generation Cloud Capable Management Vendors:** companies that have gone public in the last 5-10 years with a foundational orientation to the new cloud technologies in the market. They are characterized by their rapid growth relative to traditional vendors and modern technology stacks and business models.

3. **Cloud and Web Services Providers:** composed of public cloud providers and other key web services that are actively seeking to accelerate their penetration into the traditional enterprise and global markets.
4. **Private Equity Backed System Vendors:** the supply of capital has led to Private Equity acquiring a significant amount of cloud management startups, to the point where many of the early take-privates are now have significant revenues and an advanced view of the market such that they are making increasingly strategic add-on and platform acquisitions.

## Some Final Thoughts on the Impact of COVID-19 on the Infrastructure Software Market

COVID-19 has had a devastating impact on society and the global economy. While it is still too early to confirm the direct quantitative impact on the Infrastructure Software market (we plan to address these impacts in 2021 as various industry indicators are reported), we conclude by sharing some high level thoughts:

1. The rapid shift to remote working will have lasting impact on how networks are built and run going forward. While the expectation is that there will be a return to offices as workplaces become safe enough for in-person activities, the impact of adjusting to the COVID 'new normal' has likely pushed corporate IT to migrate more applications to the cloud much faster than had been previously planned. In many ways the 'genie is out of the bottle' and applications that previously had been deemed to be too sensitive to run in the cloud have now found their way there. As a result, we expect the level of cloud migration to have accelerated faster than predicted.
2. Remote work has created challenges for just about every function within an Enterprise. However, software development has likely been one of the most challenged areas as developers typically collaborate in person to innovate. Cloud-based software development collaboration tools such as Jira and GitHub have undoubtedly made the process of software development tracking more efficient and have likely been a great asset in maintaining productivity during COVID. We expect this trend in work from home productivity to continue to improve with more tools being embraced by remote teams. At the same time, deeply collaborative software development and subsequently innovation has likely slowed to some extent. A recent Boston Consulting Group survey found in fact that a mere 40% of respondents currently feel their companies are innovative.<sup>3</sup> This challenge will lead companies to look for new ways to drive innovation in a remote environment as well as it may be a factor in driving more companies to embrace zero-code (requiring less raw innovation) both as a stopgap as well as a permanent solution.
3. On the M&A front, there has been a slight slowdown in acquisitions by strategics due to tightening budgets and overall market uncertainty. However, we expect strategic M&A activity to pick up again late 2020 or early 2021 with strategics needing to fill key product/market gaps. P/E firm activity has remained strong with firms looking to capitalize on attractive targets looking for exits.

---

<sup>3</sup> <https://www.forbes.com/sites/joemckendrick/2020/10/18/work-from-home-fallout-productivity-up-innovation-down/#376def0f668d>



# 8

## Sources Consulted

1. “451 Research: Application containers will be a \$2.7B market by 2020.” *451 Research*, 10 Jan. 2017, [451research.com/images/Marketing/press\\_releases/Application-container-market-will-reach-2-7bn-in-2020\\_final\\_graphic.pdf](https://www.451research.com/images/Marketing/press_releases/Application-container-market-will-reach-2-7bn-in-2020_final_graphic.pdf).
2. Agarwal, Surabhi. “IBM Acquires Sanovi Technologies to Boost Hybrid Cloud.” *The Economic Times*, 27 Oct. 2016, [www.economictimes.indiatimes.com/tech/software/ibm-to-acquire-indian-it-firm-sanovi-technologies/articleshow/55090233.cms](http://www.economictimes.indiatimes.com/tech/software/ibm-to-acquire-indian-it-firm-sanovi-technologies/articleshow/55090233.cms).
3. Barker, Ian. “Companies Will Waste over \$10 Billion in Cloud Spending in the next Year.” *BetaNews*, 13 Nov. 2017, [www.betanews.com/2017/11/13/company-cloud-waste](http://www.betanews.com/2017/11/13/company-cloud-waste).
4. Bloomberg, Jason. “The Real Reason Red Hat Is Acquiring CoreOS.” *Forbes*, 5 Feb. 2018, [www.forbes.com/sites/jasonbloomberg/2018/02/04/the-real-reason-red-hat-is-acquiring-coreos/#56f36f2a5c4d](http://www.forbes.com/sites/jasonbloomberg/2018/02/04/the-real-reason-red-hat-is-acquiring-coreos/#56f36f2a5c4d).
5. Bourne, James. “HPE Acquires RedPixie to Add Azure Skills to Its Cloud Consulting Arm.” *Cloud Tech News*, 11 Apr. 2018, [www.cloudcomputing-news.net/news/2018/apr/11/hpe-acquires-redpixie-add-azure-skills-its-cloud-consulting-arm](http://www.cloudcomputing-news.net/news/2018/apr/11/hpe-acquires-redpixie-add-azure-skills-its-cloud-consulting-arm).
6. Bourne, James. “Nutanix Acquires App Mapping Provider Netsil in Another Nod to Multi-Cloud Rise.” *Cloud Tech News*, 13 Mar. 2018, [www.cloudcomputing-news.net/news/2018/mar/13/nutanix-acquires-app-mapping-provider-netsil-another-nod-multi-cloud-rise](http://www.cloudcomputing-news.net/news/2018/mar/13/nutanix-acquires-app-mapping-provider-netsil-another-nod-multi-cloud-rise).
7. Bourne, James. “Salesforce Acquires MuleSoft for \$6.5 Billion.” *Cloud Tech News*, 21 Mar. 2018, [www.cloudcomputing-news.net/news/2018/mar/21/salesforce-acquires-mulesoft-65-billion](http://www.cloudcomputing-news.net/news/2018/mar/21/salesforce-acquires-mulesoft-65-billion).
8. Brazil, Jody. “Welcoming FortyCloud to the FireMon Product Portfolio.” *FireMon*, 25 Oct. 2016, [www.firemon.com/welcoming-fortycloud-firemon-product-portfolio](http://www.firemon.com/welcoming-fortycloud-firemon-product-portfolio).
9. Burke, Steven. “HPE Acquires Cloud Cruiser In Stepped Up Flexible Capacity Hybrid Cloud Pay-As-You-Go Offensive.” *CRN*, 24 Jan. 2017, [www.crn.com/news/cloud/300083513/hpe-acquires-cloud-cruiser-in-stepped-up-flexible-capacity-hybrid-cloud-pay-as-you-go-offensive.htm](http://www.crn.com/news/cloud/300083513/hpe-acquires-cloud-cruiser-in-stepped-up-flexible-capacity-hybrid-cloud-pay-as-you-go-offensive.htm).
10. Coleman, Gregg. “CA Technologies Acquires SourceClear, Advancing SCA Capabilities for a DevSecOps World.” *Veracode*, 9 Apr. 2018, [www.veracode.com/blog/security-news/ca-technologies-acquires-sourceclear-advancing-sca-capabilities-devsecops-world](http://www.veracode.com/blog/security-news/ca-technologies-acquires-sourceclear-advancing-sca-capabilities-devsecops-world).
11. “Cloud Infrastructure Market Worth 209.66 Billion USD by 2022.” *Market Research Firm*, [www.marketsandmarkets.com/PressReleases/cloud-infrastructure.asp](http://www.marketsandmarkets.com/PressReleases/cloud-infrastructure.asp).
12. Froehlich, Andrew. “7 Acquisitions That Point to Cloud Maturity.” *InformationWeek*, 16 Jan. 2018, [www.informationweek.com/cloud/7-acquisitions-that-point-to-cloud-maturity/d/d-id/1330802?page\\_number=1](http://www.informationweek.com/cloud/7-acquisitions-that-point-to-cloud-maturity/d/d-id/1330802?page_number=1).
13. Gill, Binny, et al. “Nutanix to Welcome Minjar to the Family.” *Nutanix*, 12 Mar. 2018, [www.nutanix.com/2018/03/01/nutanix-to-welcome-minjar-to-the-family](http://www.nutanix.com/2018/03/01/nutanix-to-welcome-minjar-to-the-family).
14. “Global Cloud API Market Revenues to Reach US\$ 1.78 Bn by 2026.” *Persistence Market Research*, 19 Dec 2016, [www.persistencemarketresearch.com/mediarelease/cloud-api-market.asp](http://www.persistencemarketresearch.com/mediarelease/cloud-api-market.asp).
15. Hernandez, Pedro. “Microsoft Buys Kubernetes Specialist Deis for Its Container Expertise.” *EWEEK*, 10 Apr. 2017, [www.eweek.com/cloud/microsoft-buys-kubernetes-specialist-deis-for-its-container-expertise](http://www.eweek.com/cloud/microsoft-buys-kubernetes-specialist-deis-for-its-container-expertise).
16. Hernandez, Pedro. “Microsoft to Acquire Cloudyn for Cloud Monitoring, Cost Containment.” *EWEEK*, 29 June 2017, [www.eweek.com/cloud/microsoft-to-acquire-cloudyn-for-cloud-monitoring-cost-containment](http://www.eweek.com/cloud/microsoft-to-acquire-cloudyn-for-cloud-monitoring-cost-containment).
17. Hogan, Patrick. “Why Salesforce acquired Mulesoft?” *Quora*, 5 June 2018, [www.quora.com/Why-Salesforce-acquired-Mulesoft/answer/Patrick-Hogan-44?share=449ea003&srid=2Tf](https://www.quora.com/Why-Salesforce-acquired-Mulesoft/answer/Patrick-Hogan-44?share=449ea003&srid=2Tf).

## Top M&A Trends in Infrastructure Software

18. Hough, PJ. "Citrix Acquires Cedexis | Citrix Blogs." *Citrix.com*, 27 Feb. 2018, [www.citrix.com/blogs/2018/02/12/citrix-acquires-cedexis](http://www.citrix.com/blogs/2018/02/12/citrix-acquires-cedexis).
19. Ismail, Nick. "The Multi-Cloud/Hybrid IT Environment Will Come to Dominate the Enterprise." *Information Age*, 27 Nov. 2017, [www.information-age.com/multi-cloudhybrid-environment-dominate-enterprise-123469737](http://www.information-age.com/multi-cloudhybrid-environment-dominate-enterprise-123469737).
20. Jones, Trevor. "Cloud Security Challenges Spark Startup Acquisitions." *SearchCloudComputing*, 7 Mar. 2018, [www.searchcloudcomputing.techtarget.com/news/252436408/Cloud-security-challenges-spark-startup-acquisitions](http://www.searchcloudcomputing.techtarget.com/news/252436408/Cloud-security-challenges-spark-startup-acquisitions).
21. Lunden, Ingrid. "Amazon's AWS buys Cloud9 to add more development tools to its web services stack." *TechCrunch*, 14 July 2016, [www.techcrunch.com/2016/07/14/amazons-aws-buys-cloud9-to-add-more-development-tools-to-its-web-services-stack](http://www.techcrunch.com/2016/07/14/amazons-aws-buys-cloud9-to-add-more-development-tools-to-its-web-services-stack).
22. Lunden, Ingrid. "McAfee Acquires Cloud Security Startup Skyhigh Networks, Last Valued at \$400M." *TechCrunch*, 27 Nov. 2017, [www.techcrunch.com/2017/11/27/mcafee-skyhigh-networks](http://www.techcrunch.com/2017/11/27/mcafee-skyhigh-networks).
23. Lunden, Ingrid. "Microsoft to Buy Israeli Security Firm Hexadite, Sources Say for \$100M." *TechCrunch*, 9 June 2017, [www.techcrunch.com/2017/06/08/microsoft-confirms-its-acquired-hexadite-sources-say-for-100m](http://www.techcrunch.com/2017/06/08/microsoft-confirms-its-acquired-hexadite-sources-say-for-100m).
24. McLin, Lisa Heritage. "Rackspace and Datapipe: What This Acquisition Means for the Channel." *The Official Rackspace Blog*, 21 Sept. 2017, [www.blog.rackspace.com/rackspace-and-datapipe-what-this-acquisition-means-for-the-channel](http://www.blog.rackspace.com/rackspace-and-datapipe-what-this-acquisition-means-for-the-channel).
25. Meyer, Dan. "Docker Corrals Kubernetes Growth Across AWS, GCP, and Azure." *SDxCentral*, 13 June 2018, [www.sdxcentral.com/articles/news/docker-corrals-kubernetes-growth-across-aws-gcp-and-azure/2018/06](http://www.sdxcentral.com/articles/news/docker-corrals-kubernetes-growth-across-aws-gcp-and-azure/2018/06).
26. Meyer, Dan. "Microsoft Bets Billions On Open Source Developers With \$7.5B GitHub." *SDxCentral*, 4 June 2018, [www.sdxcentral.com/articles/news/microsoft-bets-billions-on-open-source-developers-with-7-5b-github-buy/2018/06](http://www.sdxcentral.com/articles/news/microsoft-bets-billions-on-open-source-developers-with-7-5b-github-buy/2018/06).
27. Miller, Ron. "HPE Scoops up Cloud Technology Partners to Boost Hybrid Cloud Consulting." *TechCrunch*, 5 Sept. 2017, [www.techcrunch.com/2017/09/05/hpe-scoops-up-cloud-technology-partners-to-boost-hybrid-cloud-consulting](http://www.techcrunch.com/2017/09/05/hpe-scoops-up-cloud-technology-partners-to-boost-hybrid-cloud-consulting).
28. Miller, Ron. "Oracle Boosts Cloud Offering with Apiary API Management Tool Acquisition." *TechCrunch*, 19 Jan. 2017, [www.techcrunch.com/2017/01/19/oracle-boosts-cloud-offering-with-apiary-api-management-tool-acquisition](http://www.techcrunch.com/2017/01/19/oracle-boosts-cloud-offering-with-apiary-api-management-tool-acquisition).
29. Moor Insights and Strategy. "Microsoft Acquisition Of Avere Signals Expansion In Hybrid Cloud Investment." *Forbes*, 24 Jan. 2018, [www.forbes.com/sites/moorinsights/2018/01/12/microsoft-acquisition-of-avere-signals-expansion-in-hybrid-cloud-investment/#2805ce481843](http://www.forbes.com/sites/moorinsights/2018/01/12/microsoft-acquisition-of-avere-signals-expansion-in-hybrid-cloud-investment/#2805ce481843).
30. Passemard, Antony. "Google Announces Intent to Acquire Xively." *Google*, 15 Feb. 2018, [www.blog.google/topics/google-cloud/google-cloud-announces-intent-to-acquire-xively](http://www.blog.google/topics/google-cloud/google-cloud-announces-intent-to-acquire-xively).
31. Pietschmann, Chris. "The Polynimbus Cloud Enterprise". Build Azure. Retrieved 26 September, 2018.
32. Pitchbook.
33. "Red Hat to Acquire API Management Leader 3scale." *Red Hat*, 22 June 2016, [www.redhat.com/en/about/press-releases/red-hat-acquire-api-management-leader-3scale](http://www.redhat.com/en/about/press-releases/red-hat-acquire-api-management-leader-3scale).
34. "RightScale 2018 State of the Cloud Report" *RightScale*, [assets.rightscale.com/uploads/pdfs/RightScale-2018-State-of-the-Cloud-Report.pdf](http://assets.rightscale.com/uploads/pdfs/RightScale-2018-State-of-the-Cloud-Report.pdf).
35. "Talend Acquires Restlet, a Leader in Cloud-Based API Design and Testing." *Business Wire*, 9 Nov. 2017, [www.businesswire.com/news/home/20171109006430/en/Talend-Acquires-Restlet-Leader-Cloud-Based-API-Design](http://www.businesswire.com/news/home/20171109006430/en/Talend-Acquires-Restlet-Leader-Cloud-Based-API-Design).
36. Taylor, Twain. "The 10 Biggest Cloud Computing Acquisitions of 2017." *TechGenix*, 9 Feb. 2018, [www.techgenix.com/cloud-computing-acquisitions](http://www.techgenix.com/cloud-computing-acquisitions).

## Top M&A Trends in Infrastructure Software

37. Trefis Team. "Here's Why Google Is Acquiring Apigee." *Forbes*, 13 Sept. 2016, [www.forbes.com/sites/greatspeculations/2016/09/13/heres-why-google-is-acquiring-apigee/#3882cbbc3ed5](http://www.forbes.com/sites/greatspeculations/2016/09/13/heres-why-google-is-acquiring-apigee/#3882cbbc3ed5).
38. Trumbull, Ty. "Deloitte Acquires Amazon AWS Cloud Consultant API Talent." *ChannelE2E*, 19 Mar. 2018, [www.channele2e.com/news/deloitte-acquires-amazon-aws-cloud-consultant-api-talent](http://www.channele2e.com/news/deloitte-acquires-amazon-aws-cloud-consultant-api-talent).
39. Tsidulko, Joseph. "5 Ways Red Hat's Acquisition Of CoreOS Will Shake Up The Container Tech Landscape." *CRN*, 1 Feb. 2018, [www.crn.com/slide-shows/cloud/300098736/5-ways-red-hats-acquisition-of-coreos-will-shake-up-the-container-tech-landscape.htm](http://www.crn.com/slide-shows/cloud/300098736/5-ways-red-hats-acquisition-of-coreos-will-shake-up-the-container-tech-landscape.htm).
40. <https://www.gartner.com/smarterwithgartner/6-best-practices-for-creating-a-container-platform-strategy/>
41. <https://www.infoq.com/news/2017/02/compare-container-orchestration>
42. [https://info.mesosphere.com/A-Short-History-of-Container-OrchestrationRegistrationPage.html?utm\\_source=adwords&utm\\_medium=cpc&utm\\_campaign=A-Short-History-of-Container-Orchestration&gclid=Cj0KCQjw6MHdBRctARIsAEigMxH5ko4iks5kynEEHsVcSyT2TZldexVMxjHqhJvDgCKVK2tFUUCUV\\_oaAhysEALw\\_wcB](https://info.mesosphere.com/A-Short-History-of-Container-OrchestrationRegistrationPage.html?utm_source=adwords&utm_medium=cpc&utm_campaign=A-Short-History-of-Container-Orchestration&gclid=Cj0KCQjw6MHdBRctARIsAEigMxH5ko4iks5kynEEHsVcSyT2TZldexVMxjHqhJvDgCKVK2tFUUCUV_oaAhysEALw_wcB)
43. <https://stackify.com/kubernetes-guide-container-orchestration/>
44. <https://cloud.google.com/kubernetes-engine/>
45. <http://www.digitaljournal.com/pr/3903995>
46. <http://www.sbwire.com/press-releases/growth-opportunities-in-global-cloud-computing-services-market-industry-analysis-outlook-2025-1031405.htm>
47. <https://sweetcode.io/sysdig-closes-68-5-million-in-series-d-funding-to-enable-enterprises-to-secure-and-monitor-containers-and-cloud-native-applications/>
48. <https://sweetcode.io/service-mesh-mean-enterprise-security/>
49. <https://sweetcode.io/monitoring-microservice-ecosystem-logdna/>
50. <https://electric-cloud.com/blog/2017/01/devops-predictions-2017/>
51. <https://sweetcode.io/logging-kubernetes-log-management/>
52. <https://www.nextplatform.com/2015/09/02/verizon-satisfies-google-envy-with-mesos/>
53. <https://mesosphere.com/why-mesos/>
54. <https://www.marketscreener.com/news/Avi-Networks-Announces-a-First-of-its-Kind-Container-Services-Fabric-for-Mesosphere-and-Docker-bas--21866305/>
55. <https://www.reuters.com/article/us-vmware-cloud/vmware-to-acquire-startup-cloudhealth-in-push-to-grow-cloud-offerings-idUSKCN1LC1T7>
56. <http://go.451research.com/pivotal-vmware-google-come-together.html?>
57. Oppenheimer Report, BTIG Report, BuySellSignalReport, Evercore Report, RBC Capital Markets Report
58. Who am I following: John Arundel @bitfield; Jay Lyman @ripcitylyman; Abby Fuller @abbyfuller; Jessie Frazelle @jessfraz
59. What am I reading: [www.containerjournal.com](http://www.containerjournal.com)
60. <https://www.forbes.com/sites/joemckendrick/2020/10/18/work-from-home-fallout-productivity-up-innovation-down/#376def0f668d>

WOODSIDE  
CAPITAL  
PARTNERS

WCP

## **Silicon Valley Office**

2650 Birch St.#100  
Palo Alto, CA 94306,  
United States

## **London Office**

Riverbank House, 2 Swan Ln.  
London EC4R 3TT, UK

