USER SURVEY

A snapshot of the OpenStack users' attitudes and deployments

Executive Summary

OpenStack's tenth User Survey Report is a snapshot of 1,052 surveys and nearly 600 deployments that were recorded from June 1 through August 21, 2017. While this report includes comparisons of November 2017 to April 2017 data, the report also looks at year-over-year analysis of 2017 to 2016.

MORE CLOUDS IN 2017: There were nearly 1,000 unique OpenStack deployments logged in 2017, a 95% increase compared to 2016.

GROWTH OF USERS AMONG MAINSTREAM, NON-IT INDUSTRIES: OpenStack's broad usage among industries beyond information technology (IT) was demonstrated in 2017 by a significant increase in responses among finance and government users in addition to increases in industries like telecom and research.

SURVEY PARTICIPATION GROWS IN ASIA, PARTICULARLY IN CHINA WITH INCREASED OPENSTACK ADOPTION AND AVAILABILITY OF TRANSLATED SURVEY: One-third of OpenStack users surveyed in 2017 were from Asia, an increase from 23% in 2016. The most significant growth was among respondents in China, increasing to 17% of overall respondents in 2017 compared to 5% in 2016. For the first time in November 2017, the OpenStack User Survey was translated into seven additional languages, increasing accessibility for users in Asia to take the survey.

NPS COMMENTS REVEAL CONTINUED FRUSTRATION WITH UPGRADES AND DOCUMENTATION: The NPS score dipped one point, from 24 to 23, between the April 2017 to November 2017 reports. Consistent with previous surveys, upgrades and documentation were cited as areas for improvement, while the community, APIs, flexibility and scalability were most cited among the positive attributes.

IRONIC BARE METAL SERVICE SEES SIGNIFICANT GROWTH AMONG PRODUCTION DEPLOYMENTS: From April 2017 to November 2017, there was a significant growth in production usage of Ironic from 9% to 20%; a notable increase was due to users running container orchestration frameworks on bare metal.

INCREASE IN IMPLEMENTATION OF MULTI-CLOUD STRATEGY: 48% of OpenStack users indicated that users of their OpenStack deployment also interact with another cloud, demonstrating the multi-cloud trend highlighted by recent case studies from Workday, GE Healthcare and Adobe Marketing Cloud. These case studies can be found at https://www.openstack.org/users.

KUBERNETES CONTINUES TO BE THE MOST POPULAR TOOL USED BY 50% OF DEPLOYMENTS USING A PAAS OR CAAS TOOL: While nearly half of all deployments reported using a PaaS or CaaS tool to manage applications on top of their OpenStack clouds, Kubernetes remains the top application framework on OpenStack.

" *"OpenStack today is the unified platform for multi-cloud management, including container management. Besides "free" and "open," we also like its abstraction of APIs and the plug-in system, which is very important for us."*

Yaguo Zhou, Senior Cloud Architect, China UnionPay "

SURVEY CREDITS

Analyze the User Survey Yourself

Dig deeper into the data at the User Survey Analytics Dashboard available at http://www.openstack.org/analytics. The dashboard provides six global filter categories and three data sets (2015, 2016 and 2017). It provides a more comprehensive set of information than this survey report snapshot, especially in regards to technology choices for OpenStack deployments.

Note the User Survey is always open, and the dashboard captures live data as survey responses are logged. This survey report is based on a snapshot of data collected between June 1, 2017 and August 21, 2017, but the online dashboard includes surveys submitted before and after that date. As a result, dashboard results sometimes vary from this report due to different collection periods.

95 percent increase in deployments tracked from 2016 to 2017

There was a 95% increase in unique OpenStack deployments logged in 2017 over 2016, which was calculated by de-duplicating deployments across both surveys each year in order to establish a unique number of deployments logged for 2016 and 2017. In the October 2016 survey, promotion focused on asking users to update existing deployments from April 2016, so the number of new deployments logged during that cycle was an outlier prompting year-over-year analysis.

There was not a significant increase in deployments in the November 2017 report as compared to April 2017, but there were more unique organizations logging deployments, meaning fewer organizations logged multiple deployments. The first survey of the year typically sees a greater increase in new deployments, potentially due to the close proximity of survey periods. Taking this into account, the survey team and User Committee are going to evaluate the possibility of shifting to an annual survey moving forward.

OpenStack increasingly mainstream with growing use outside of IT industry

Users who reported being part of the IT industry decreased significantly in 2017 compared to 2016, from 65% to 55%, while the percentage of users reporting industries outside of IT grew in 2017. Although IT remains the largest category, telecommunications, academic/research, retail and manufacturing all grew in 2017 in addition to significant increases in finance and government. This trend has been reflected in new user stories emerging in 2017, such as American Airlines, China UnionPay, GE Healthcare, Insurance Australia Group,
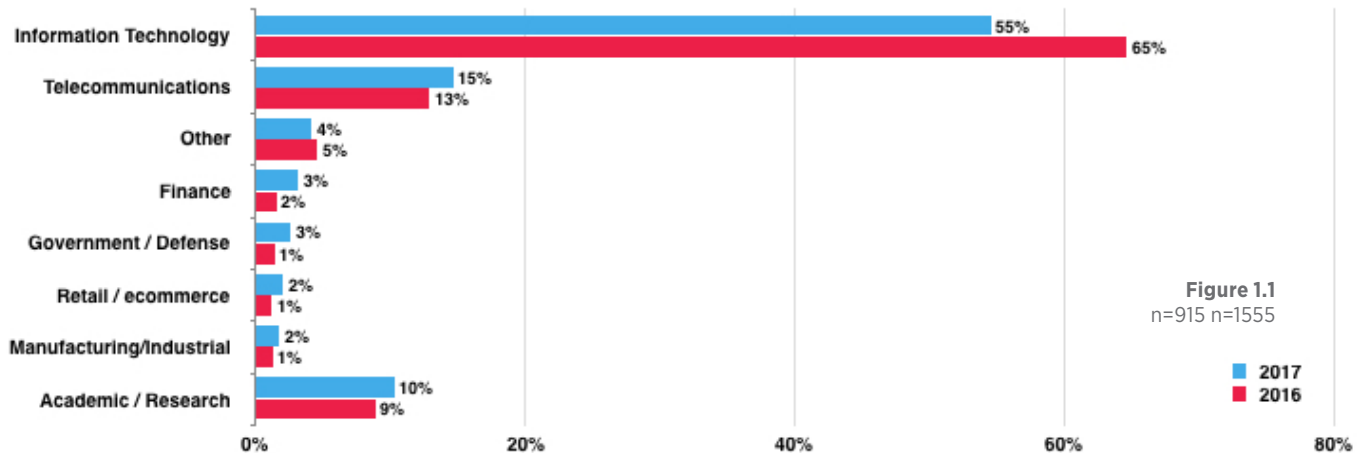
> *OpenStack is very stable with the recent releases, and I have no complaints for running cloud native applications and containers in my private cloud.*
>
> AsvinChandar Selvaraj, Senior Manager of Converged Infrastructure, FICO

Mercedes Benz R&D, Ocado Technology, Pacific Textiles Holding Limited, Sprint and the U.S. Army Cyber School.

Which industries use OpenStack?

Figure 1.1
n=915 n=1555

■ 2017
■ 2016

Information Technology: 55% (2017), 65% (2016)
Telecommunications: 15% (2017), 13% (2016)
Other: 4% (2017), 5% (2016)
Finance: 3% (2017), 2% (2016)
Government / Defense: 3% (2017), 1% (2016)
Retail / ecommerce: 2% (2017), 1% (2016)
Manufacturing/Industrial: 2% (2017), 1% (2016)
Academic / Research: 10% (2017), 9% (2016)

One-third of survey respondents from Asia

OpenStack users in the November 2017 report span 69 countries and 452 cities. The United States, China and Germany accounted for half of survey respondents this cycle.

There was a significant increase in the percentage of OpenStack users from Asia who took the survey. One factor to consider in this increase was the introduction of translated versions of the OpenStack User Survey in the November 2017 cycle. The survey is now available in eight languages—traditional and simplified Chinese, English, French, German, Indonesian, Japanese and Korean. 20% of respondents completed a non-English survey in the November 2017 cycle.

Asia accounted for 33% of overall survey respondents in 2017, compared to 23% in 2016. The increase was heavily influenced by participation in China, which accounted for 17% of overall respondents, second to the United States at 28%. Top industries represented by Chinese users are IT (50%), telecom (14%), government / defense (7%) and finance (6%).

The non-English language survey was completed by 75% of users in China in November 2017. OpenStack growth in China can be seen in the user stories that have come forward in the past year: China UnionPay, China Mobile, China Telecom, China Railway Corporation, SINOPEC Henan Oilfield Branch Company, the State Grid Corporation of China and Tencent. This growth was also reflected by the increased investment from IT organizations in the OpenStack ecosystem like China Unicom, EasyStack, FiberHome, H3C, Huawei, Inspur, UnitedStack and ZTE Corporation.
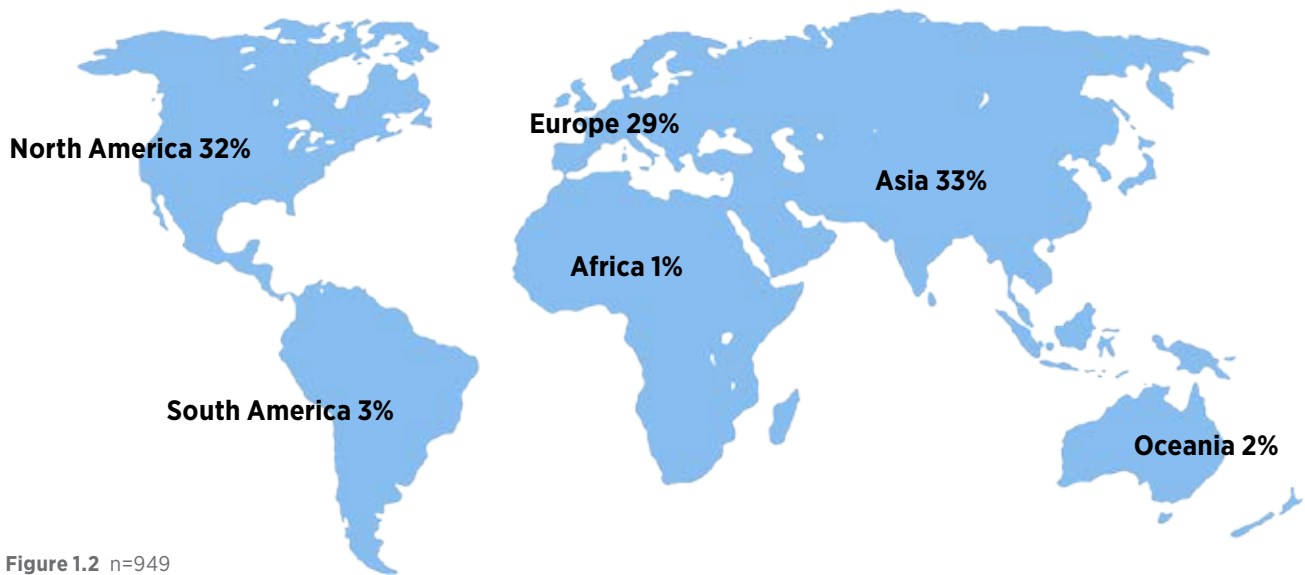
Where in the world are OpenStack users?

North America 32%

Europe 29%

Asia 33%

Africa 1%

South America 3%

Oceania 2%

Figure 1.2 n=949

Continent	2016	2017
Africa	1%	1%
Asia	23%	33%
Europe	24%	29%
N.America	47%	32%
Oceania	2%	2%
S.America	3%	3%

On-Premises private cloud continues to be the most popular deployment type

On-premises private cloud continues to be the most popular deployment type for respondents to the User Survey. The percentage breakdowns of cloud types (on-premises private, remotely managed private, public cloud and community cloud) remained stable from April to November 2017, but there was a significant increase in the percentage of on-premises private cloud deployments from 2016 to 2017.

Because the OpenStack User Survey is opt-in and promoted through OpenStack community channels, it primarily targets users who are directly engaged in the OpenStack community and likely operating OpenStack clouds, which may not reflect public cloud end users.

"
"There is no other clear private cloud options that match the breadth of infrastructure-as-a-service that Openstack provides out of the box"

Joseph Sandoval, Engineering Manager, Cloud Platform at Adobe Marketing Cloud
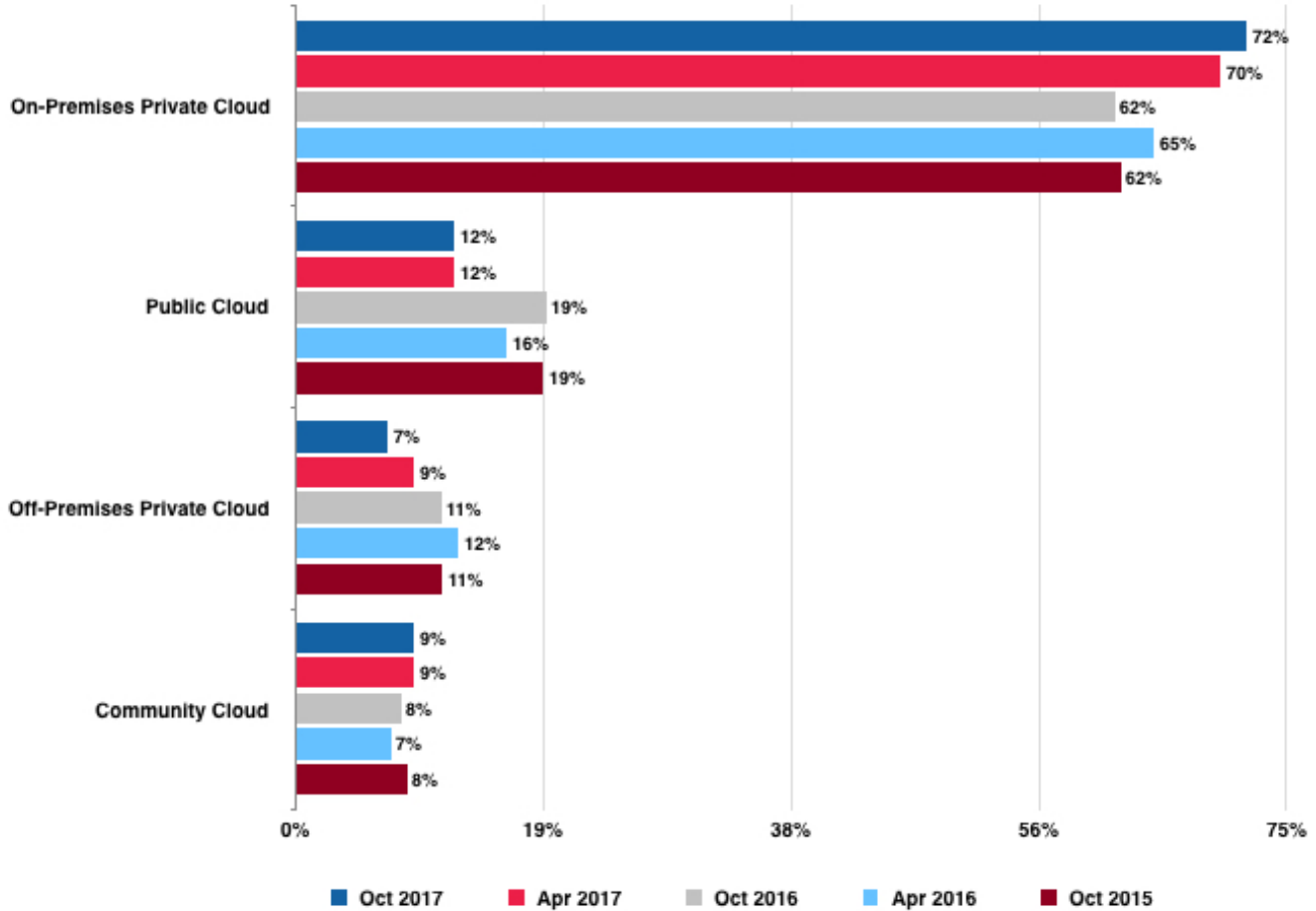
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What types of clouds are running OpenStack?

Figure 1.3 n=557

Among OpenStack projects demonstrating more adoption, Ironic bare metal service sees the most significant growth among production deployments

Ironic bare metal provisioning, TripleO deployment service, Manila file management service, and Barbican key management service were among the projects that saw significant growth in production usage. Octavia load balancer was added as a response choice for the first time in November 2017 and already reports 7% adoption among production deployments. The growth among these projects is an example of how clouds are looking to OpenStack projects to add new capabilities to their environment.

The increase in production usage of Ironic from 9% to 20% was especially notable, as more users such as eBay and Commonwealth Bank are running container orchestration frameworks on OpenStack bare metal.

The usage of core OpenStack services–such as Nova, Glance, Horizon and Keystone–in production deployments decreased in the November 2017 survey compared to their adoption metrics in April 2017. The data presents a significant change compared to the last 18 months where production

adoption for these projects was trending up. The survey team is investigating possible explanations, including changes to the survey format like the addition of languages and user interface changes. More data collection is required in 2018 to determine if this presents the early sign of a trend toward composability, meaning users compose unique sets of OpenStack projects rather than deploying the full set of "core" services.

This breakdown helps identify how various OpenStack projects are being used, demonstrating that not all users run every OpenStack project, which projects are found in most deployments, and how OpenStack users are able to add a project or set of projects for their specific use case.

Additional adoption, maturity and age metrics can be viewed for all of the OpenStack projects at the Project Navigator: https://www.openstack.org/software/project-navigator.

Number of projects used per deployment
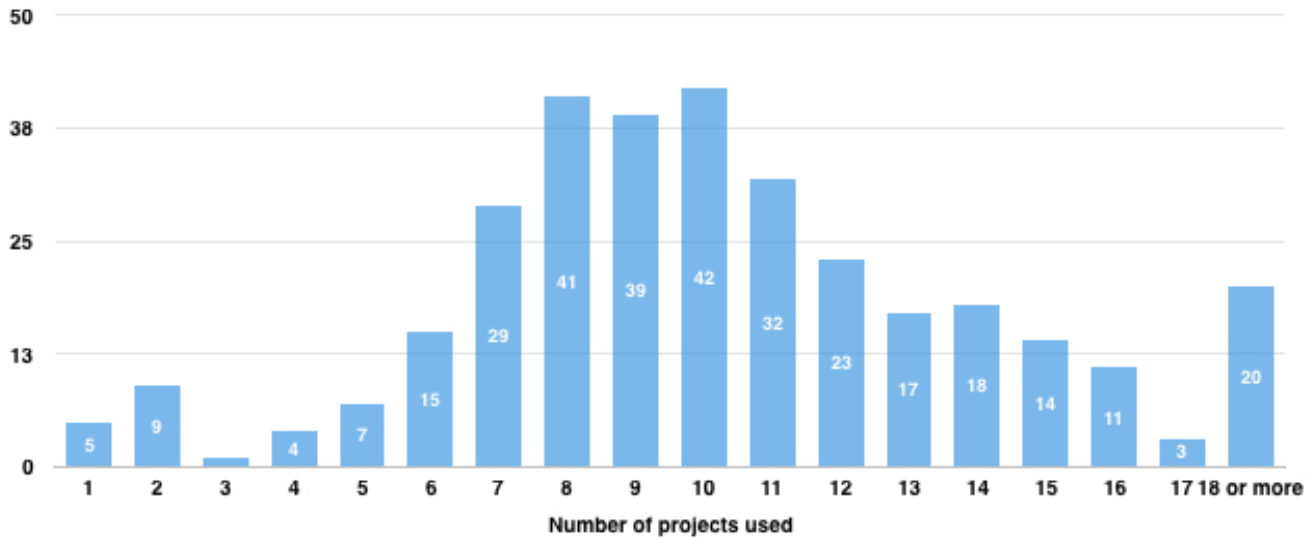
Across all deployment responses to the November 2017 survey, the average OpenStack deployment uses 11 projects, up from 9 in the April 2017 survey.

Among deployments in production, the average is 9 projects compared to 8 projects in April 2017.

How likely are OpenStack users to recommend OpenStack?

The Net Promoter Score (NPS) gauges user satisfaction and sentiment, and additional questions help identify areas of improvement as well as what the community values the most when using OpenStack based on their score. The community, OpenStack APIs, flexibility and scalability were among the top reasons why users like OpenStack (other than free and open), while upgrades, documentation and complexity were most commonly cited as areas for improvement. Of those citing upgrades as a pain point, over 50% are running OpenStack Newton or Mitaka, which are two and three releases back from the most current, respectively.

Compared to April 2017, the number of users who responded to the NPS question decreased by 27%. While the percentage of detractors remained stable, promoters decreased by 1 point, causing the NPS score for the November 2017 survey to dip to 23 compared to 24 in April 2017. When analyzing only the English language surveys, the NPS score increases to 26 for the November 2017 cycle.

With the translation of the User Survey as well as a trend of increasing globalization among respondents—72% of survey respondents were located outside of the United States in 2017—the survey team is evaluating if the NPS is the best way to measure global community satisfaction. Comparing some of the NPS scores from translated versions of the survey with the matching comments leads the survey team to believe there may be some confusion about the question among non-native English speakers.

Half of OpenStack users have a multi-cloud strategy

Users indicated that 48% of OpenStack clouds interact with another cloud, compared to 38% last cycle. Amazon Web Services (AWS) remains the most popular cloud interacting with OpenStack deployments, at 48% despite a significant decrease from 58% in the previous cycle.

In addition to AWS, Microsoft Azure and Google Compute Engine decreased, while OpenStack public clouds and OpenStack private clouds remained stable.

Organizations including Workday, Adobe Marketing Cloud, GE Healthcare, Snapdeal and Comcast are leveraging both a public cloud as well as an OpenStack private cloud. This question is not required for users to complete and the survey allows users to select multiple options for this question.

> " *We believe there is a direct need for competition in the IaaS market and OpenStack provides that by being both a solid choice in public cloud as well as private, creating true hybrid possibilities.*
>
> Johan Christenson, CEO,
> City Network. "

With which other clouds do your users interact?

Figure 1.5 n=435

Amazon Web Services — 48 %
OpenStack Private Cloud — 38 %
Microsoft Azure — 27 %
Google Compute Engine — 21 %
OpenStack Public Clouds — 19 %
Other — 6 %
None — 22 %

13
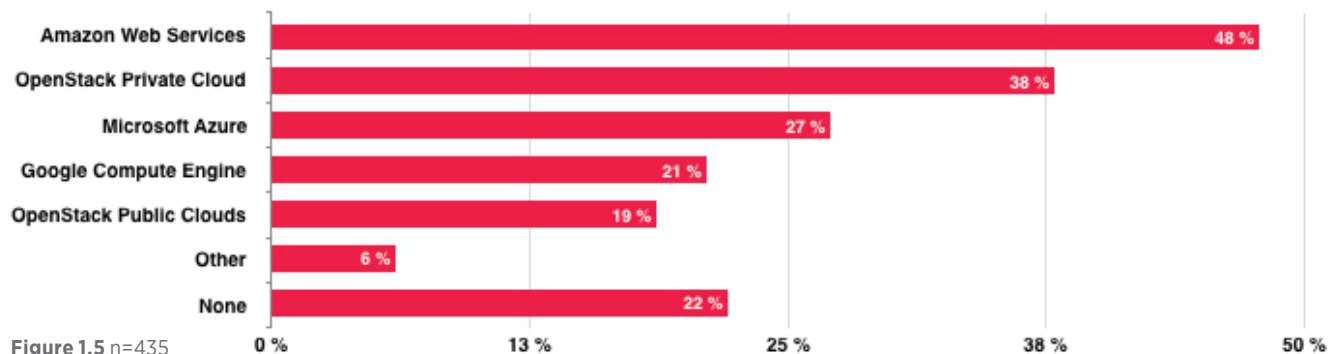
Standardizing on open APIs the top business driver

Standardizing on the same open platform and APIs that power a network of public and private clouds was the most often cited as the No. 1 business driver for OpenStack. Increased operational efficiency, accelerating innovation, avoiding vendor lock-in and saving money round out the top five business drivers. While the precise order of the top business drivers shifts each cycle, the top five remain consistent when compared to previous cycles.

Other business drivers include the flexibility of the platform, the value of open source, and supporting scientific and software-defined networking use cases.

For this question's methodology, users were asked to name their top five business drivers and rank these from 1 to 5. To best express this data, each No. 1 rank was assigned a weight of 5 points; each No. 2 rank assigned 4 points; and so on. Point totals were then calculated for both this cycle's survey and last cycle's to show changes over time.
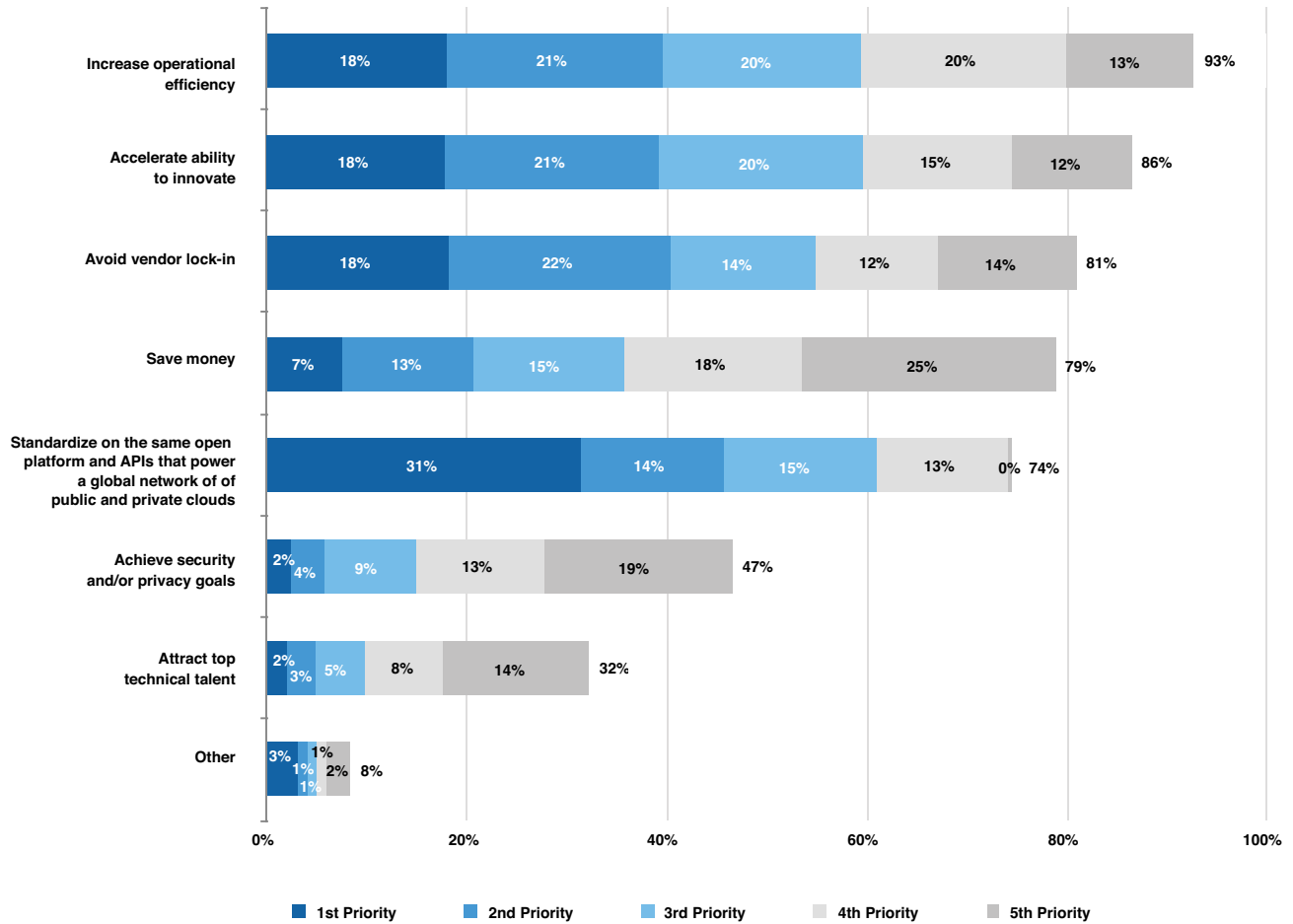
Why do organizations choose OpenStack?

Figure 1.6 n=789

Kubernetes continues to be most popular application framework on OpenStack

Nearly half of all deployments reported using a PaaS or CaaS tool to manage applications on top of their OpenStack clouds. Kubernetes continues to be the most popular tool used by 50% of deployments using a PaaS or containers tool and 32% of production deployments that responded

to this question in the November 2017 report. OpenStack users including BBVA, CERN, eBay, LivePerson, Paddy Power Betfair and SAP have reported running Kubernetes on their OpenStack infrastructure.

While the percentage of OpenStack users deploying Kubernetes on OpenStack has remained stable year-over-year at 47%, twice as many users answered this question in 2017 as compared to 2016.

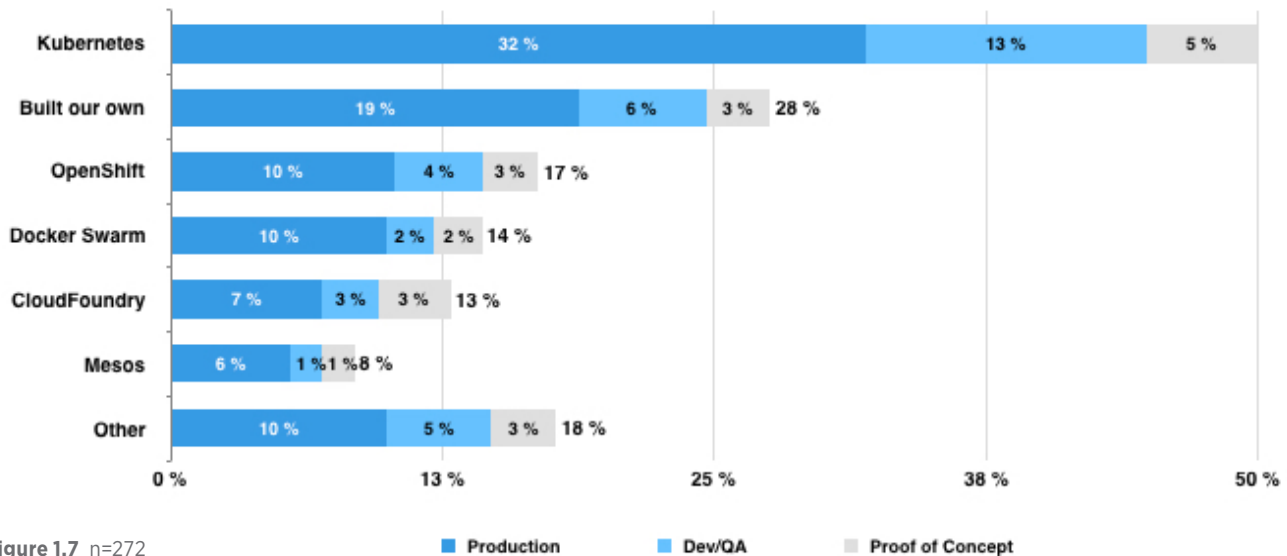## What PaaS & containers tools are use to manage OpenStack applications?

Figure 1.7 n=272

OpenStack Median Cloud Profile

Hypervisor	KVM
Cinder Block Storage driver	Ceph
Neutron networking driver	Open vSwitch or Linux Bridge
Identity service driver	SQL
Operating system	Ubuntu server or CentOS
Database	MariaDB / MySQL or MongoDB
Configuration management tool	Ansible

The median OpenStack cloud deployment profile is based on the most popular response choices to the deployment decisions section of the User Survey in November 2017. This data has remained consistent from past surveys, but doesn't represent the breadth of technology choices that OpenStack users are implementing in their deployment. Find all of the data and response choices at http://www.openstack.org/analytics.

Huawei, Red Hat and Canonical top the list of vendors for OpenStack users

The April 2017 survey was the first time we asked OpenStack users which vendors power their OpenStack deployments. In April 2017, Red Hat and Canonical were the top two vendors. In the November 2017 survey, Red Hat, Canonical and Cisco maintained top slots similar to April, but

Huawei and EasyStack both significantly increased their representation. The support for translation may have helped capture their user base, as over 80% of users working with these companies took a non-English version of the survey.

Vendors in the OpenStack ecosystem collaborate with the OpenStack Foundation to promote the user survey among their customers, which may affect the distribution of users among OpenStack vendors.

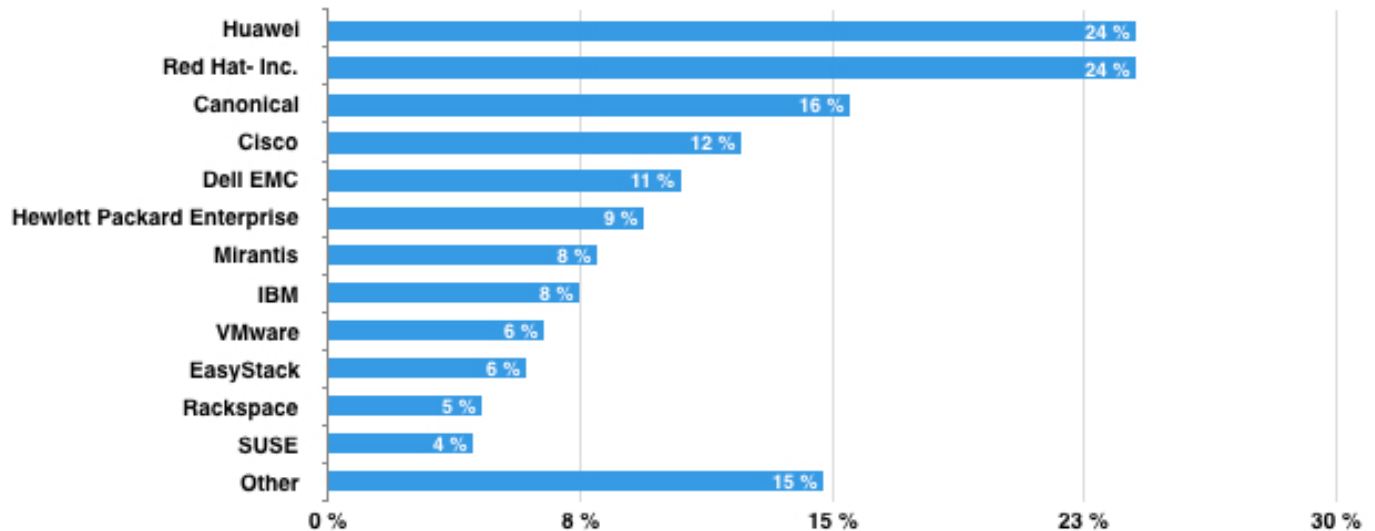## Which vendor's products power your OpenStack cloud?

Figure 1.8 n=373

SURVEY SAYS.....

Learn more about users' attitudes and technology choices in the ninth edition of the OpenStack user survey. Almost 1,000 users representing almost 400 organizations contributed to this report.

7,845