Cloud Computing

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What is Cloud Computing?

Cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet (“the cloud”) to offer faster innovation, flexible resources, and economies of scale. You typically pay only for cloud services you use, helping you lower your operating costs, run your infrastructure more efficiently, and scale as your business needs change.

Literature Review

- The flexibility of automatically upgrading your software/hardware and cost reduction. Cloud computing helps a business to store a large amount of data at relatively reduced costs enabling even small business to fashion their activities by adopting cloud computing (Rosati and Lynn, 2020).

- Companies can only use what they need. They can configure their cloud to where it would auto-scale depending on how busy it gets. Which allows the company's system to never crash due to memory space. Generally used on an as-needed basis, companies only pay for what they use and can scale up or down to suit customer and market demands (Oleksiuk, 2021).

Literature Review

- According to the authors cloud computing will transform a way digital data is shared, store and transmitted. Article uses US NIST standard definition of the technology which is a platform that allows you to access and share large amount of servers, storages, services, applications and networks inside of that platform. It requires minimal management efforts and services providers. Three main models of clouds are explained like IaaS, SaaS, PaaS know as Rimal model. However, authors raised concerns about security and privacy issues. If there is so much data store in one point, then probability of a cyber attack is greater. (Atobishi and Podruzsik , 2017).

- Authors of the article describe cloud computing technology (CCT) as revolutionary, because you can provide software, applications services and store data at one point that is a cloud. Business is better organized; folders; documents and anything else could be shared from different location all over a globe. This is indeed revolutionary. All of that exactment an security and privacy issue appears. What would happen if a malicious individual got access? From clouds to the Reality? (https://doi.org/10.1080/08276331.2018.1466850 Attaran and Woods, 2019).

Methodology

- We reached out to Cloud administrators, engineers, and security personnel via LinkedIn. We randomly sent them a survey using Google forms.
- The survey consisted of 4 multiple-choice questions and 4 questions for short answer response. Participants were given the survey anonymously. Because we had only 41 responses to the survey, we acknowledge that this would limit the scope of our analysis.

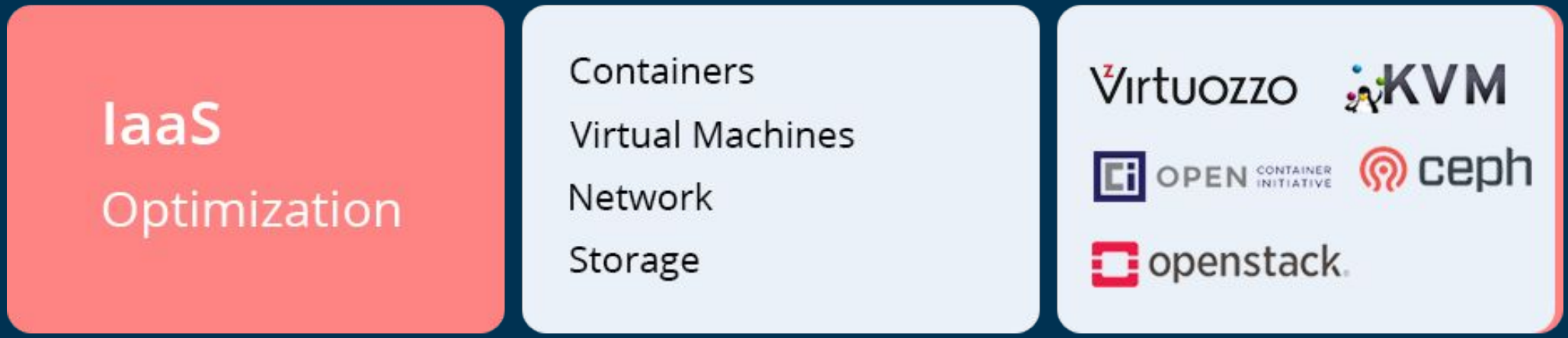
Statement of the problem

- Companies are afraid that their data would not be secured in the cloud.
- Companies spend a lot of money on electricity keeping their on-premise hardware running.
- 94% of companies that lose their data when faced with natural disasters do not survive (Friend, 2021)
- It is difficult for companies to instantly upgrade or downsize physical hardware.
- Companies must worry about training.
- Companies spend a lot of money on maintenance and upkeeping.

Which layer of Cloud Computing is current being used by your company?

Examples of IaaS

Infrastructure as a Service



Containers are packages of Software that contains all the necessary elements to run in any environment. In this way, containers virtualize the operating system and run anywhere, from a private data center to the public cloud or even on a developer's personal laptop.

Virtual Machines is a digital version of a physical computer. Virtual machine software can run programs and operating systems, store data, connect to networks, and do other computing functions, and requires maintenance such as updates and system monitoring.

Examples of PaaS

Platform as a Service

GitHub is a web-based version-control and collaboration platform for software developers

Kubernetes is an open-source container management platform that unifies a cluster of machines into a single pool of compute resources

Docker is a tool that is used to automate the deployment of applications in an environment designed to manage containers

Examples of SaaS

Software as a Service

SaaS Enablement

Marketplace
Custom Packaging
Premium CDN & DNS
Built-In Billing

Marketplace a type of application marketplace. Customers can go to an online storefront to find, purchase, and manage cloud-based SaaS applications.

CDN (content delivery network) also called a content distribution network, is a group of geographically distributed and interconnected servers.

DNS (Domain name system) for managing DNS and application traffic for public, private, and hybrid public/private networks. Dedicated DNS can be deployed to service public-facing websites and applications as well as internal DNS use cases

On-site	IaaS	PaaS	SaaS
Applications	Applications	Applications	**Applications**
Data	Data	Data	**Data**
Runtime	Runtime	**Runtime**	**Runtime**
Middleware	Middleware	**Middleware**	**Middleware**
O/S	O/S	**O/S**	**O/S**
Virtualization	**Virtualization**	**Virtualization**	**Virtualization**
Server	**Server**	**Server**	**Server**
Storage	**Storage**	**Storage**	**Storage**
Networking	**Networking**	**Networking**	**Networking**

Service provider manages

Benefits of IaaS (Infrastructure as a Service)

Pay for What You Use: Fees are computed via usage-based metrics

Reduce Capital Expenditures: IaaS is typically a monthly operational expense

Dynamically Scale: Rapidly add capacity in peak times and scale down as needed

Increase Security: IaaS providers invest heavily in security technology and expertise

Future-Proof: Access to state-of-the-art data center, hardware and operating systems

Self-Service Provisioning: Access via simple internet connection

Reallocate IT Resources: Free up IT staff for higher value projects

Reduce Downtime: IaaS enables instant recovery from outages

Boost Speed: Developers can begin projects once IaaS machines are provisioned

Enable Innovation: Add new capabilities and leverage APIs

Level the Playing Field: SMBs can compete with much larger firms

Disadvantages of IaaS (Infrastructure as a Service)

Unexpected Costs: Monthly fees can add up, or peak usage may be more than expected

Process Changes: IaaS may require changes to processes and workflows

Runaway Inventory: Instances may be deployed, but not taken down

Security Risks: While IaaS providers secure the infrastructure, businesses are responsible for anything they host

Lack of Support: Live help is sometimes hard to come by

Complex Integration: Challenges with interaction with existing systems

Limited Customization: Public cloud users may have limited control and ability to customize

Broadband Dependency: Only as good as the reliability of the internet connection

Managing Availability: Even the largest service providers experience downtime

Confusing SLAs: Service level agreements (SLAs) can be difficult to understand

Regulatory Uncertainty: Evolving federal and state laws can impact some industries' use of IaaS, especially across country borders

Benefits of PaaS (Platform as a Service)

Cost Effective: No need to purchase hardware or pay expenses during downtime

Time Savings: No need to spend time setting up/maintaining the core stack

Speed to Market: Speed up the creation of apps

Future-Proof: Access to state-of-the-art data center, hardware and operating systems

Increase Security: PaaS providers invest heavily in security technology and expertise

Dynamically Scale: Rapidly add capacity in peak times and scale down as needed

Custom Solutions: Operational tools in place so developers can create custom software

Flexibility: Allows employees to log in and work on applications from anywhere

Disadvantages of PaaS (Platform as a Service)

Vendor Dependency: Very dependent upon the vendor’s capabilities

Risk of Lock-In: Customers may get locked into a language, interface or program they no longer need

Compatibility: Difficulties may arise if PaaS is used in conjunction with existing development platforms

Security Risks: While PaaS providers secure the infrastructure and platform, businesses are responsible for security of the applications they build

Benefits of SaaS (Software as a Service)

Accessibility: Ability to run via an internet browser 24/7 from any device

Operational Management: No installation, equipment updates or traditional licensing management

Cost Effective: No upfront hardware costs and flexible payment methods such as pay-as-you-go models

Scalability: Easily scale a solution to accommodate changing needs

Data Storage: Data is routinely saved in the cloud

Analytics: Access to data reporting and intelligence tools

Increase Security: SaaS providers invest heavily in security technology and expertise

Disadvantages of SaaS (Software as a Service)

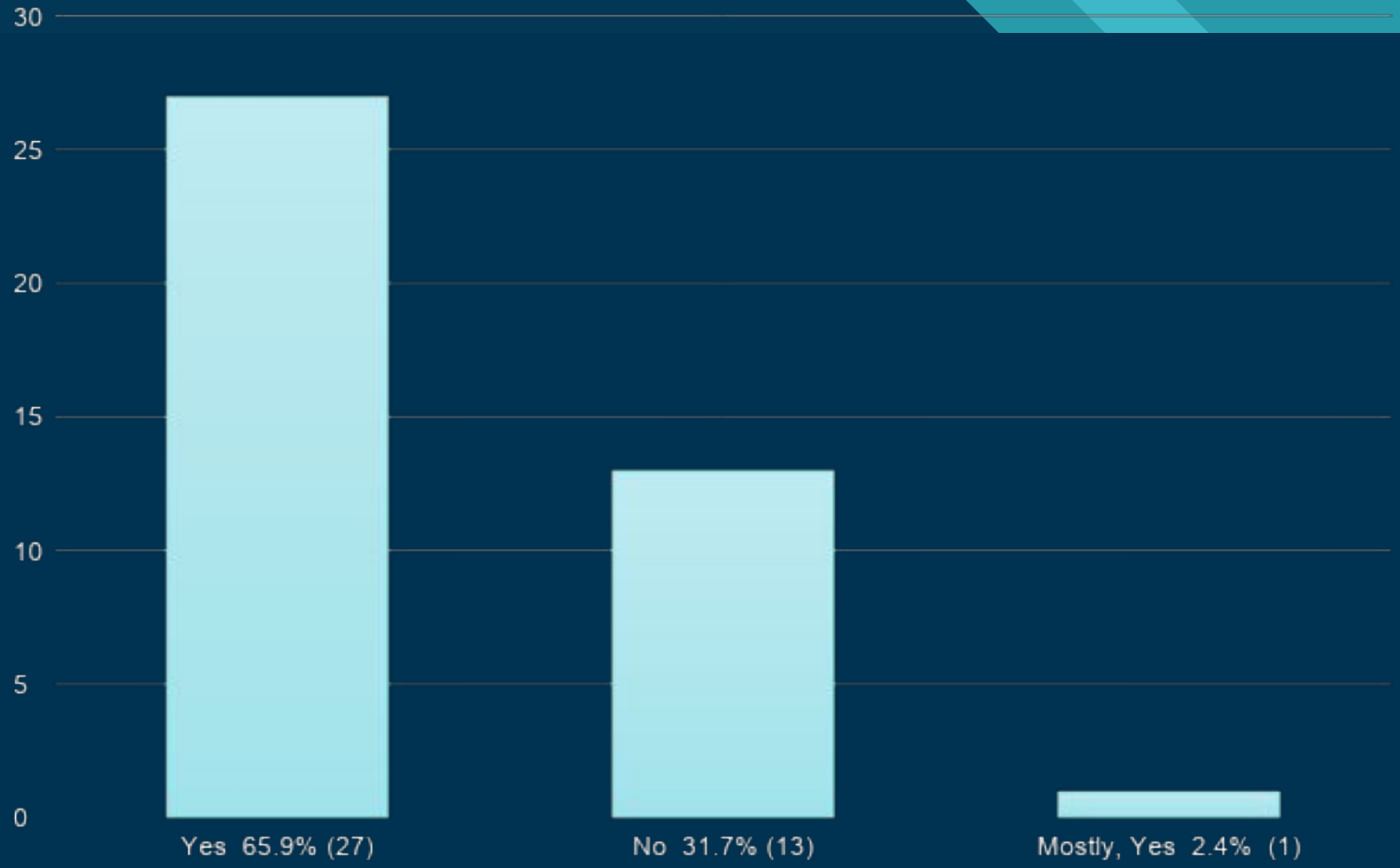
Loss of Control: The vendor manages everything, making you dependent upon the vendor's capabilities

Limited Customization: Most SaaS applications offer little in the way of customization from the vendor

Slower Speed: SaaS solutions can have more latency than client/server apps

Security Risks: While the SaaS provider secures the application itself, strict measures should be taken with sensitive data

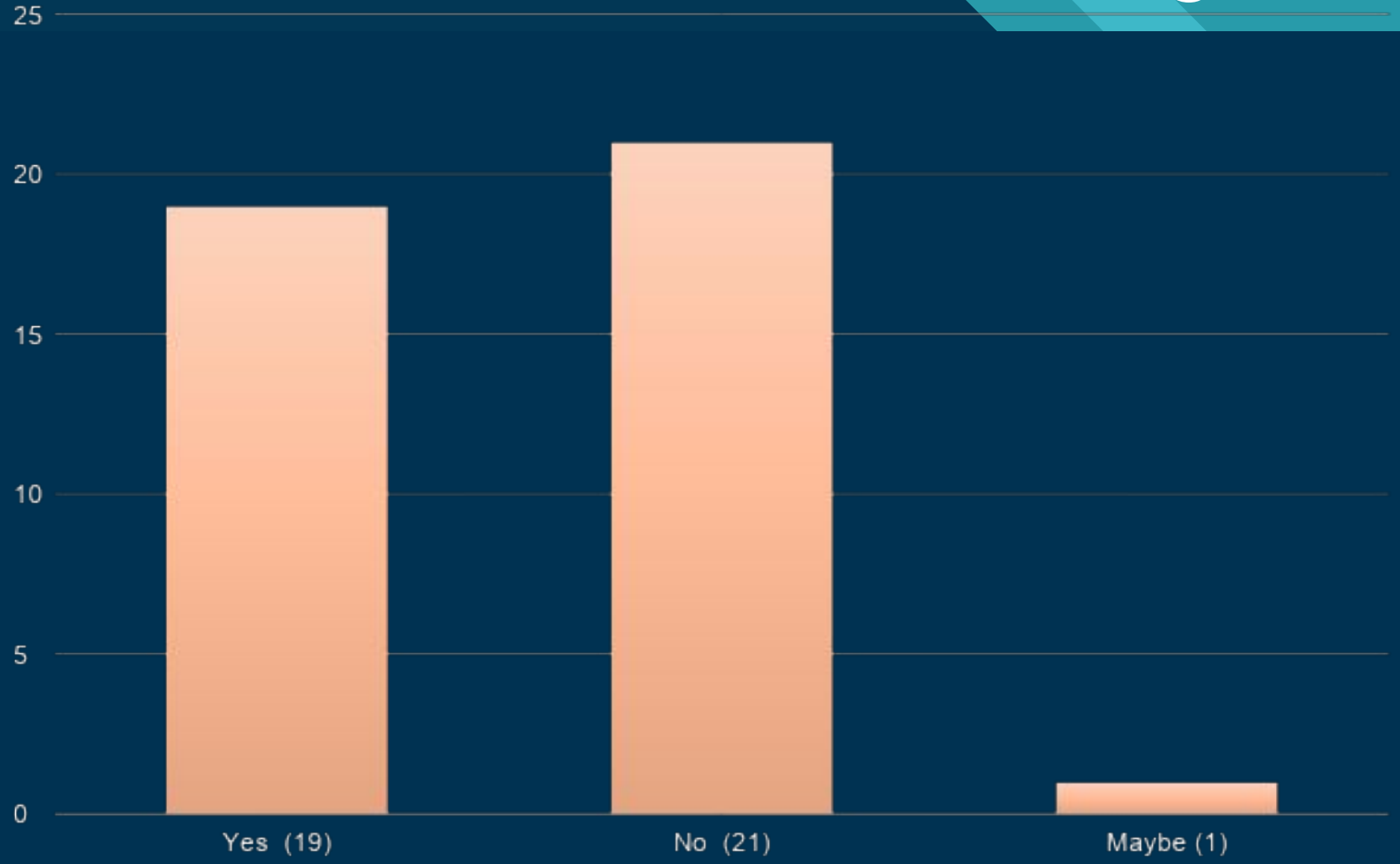
Is your current solution meeting your needs?



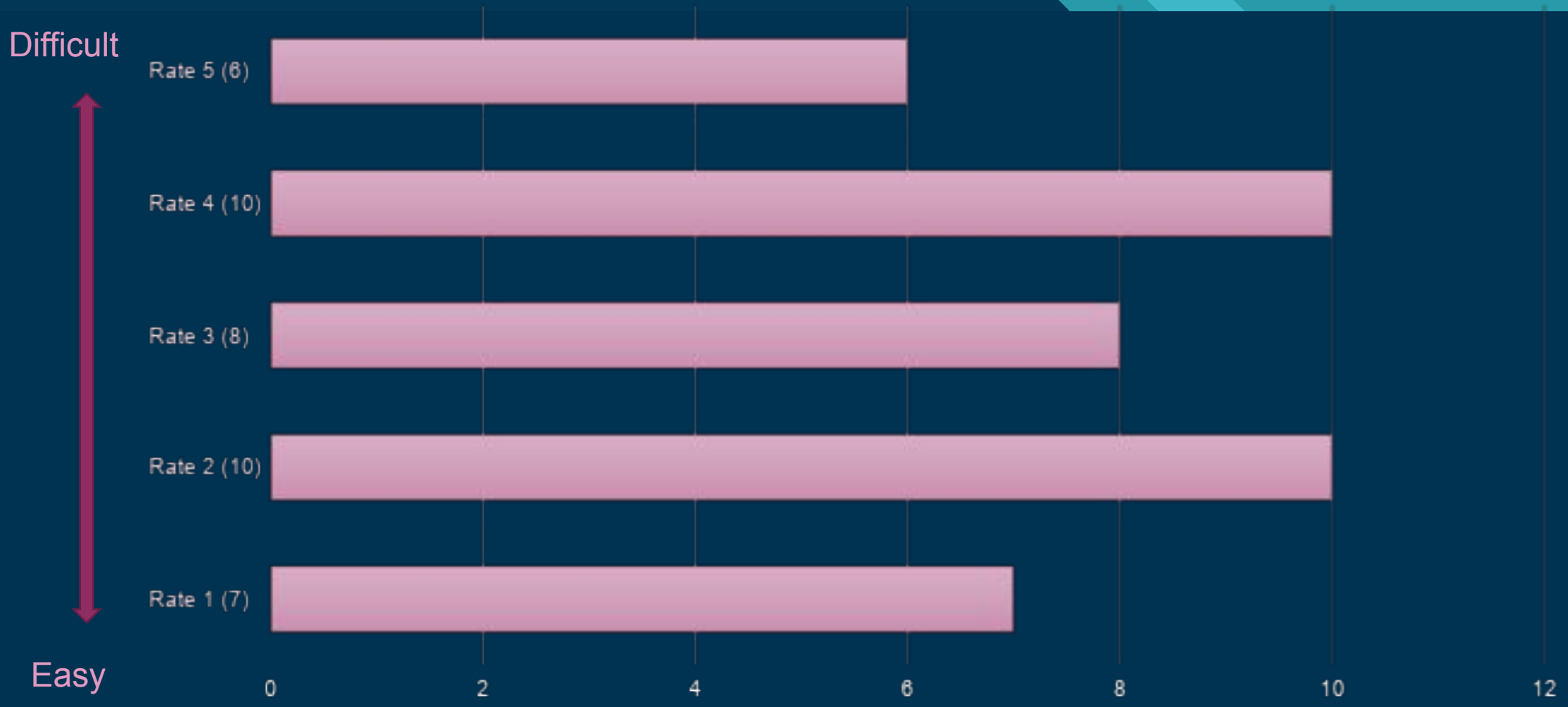
"Yes, all the clients with on-prem services like the ability to scale up or down when needed."

"On-prem, no. Cloud is a fraction of the time and expense."

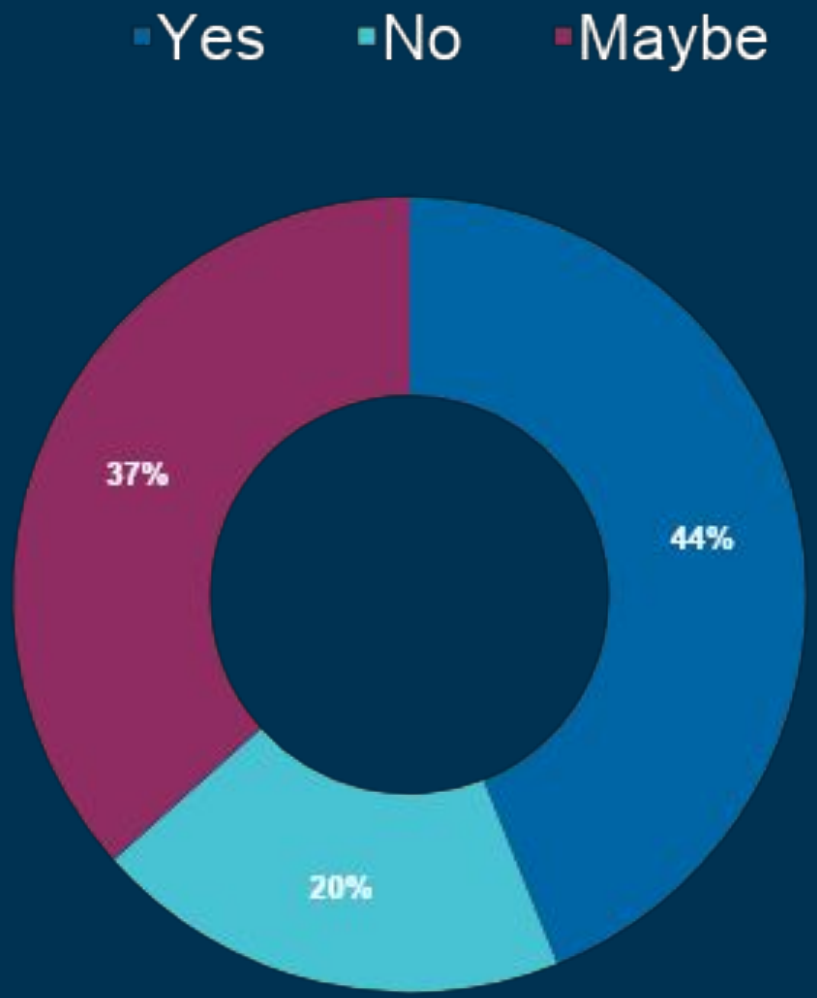
Do you have any contractual and vendor commitments that constrains migration?



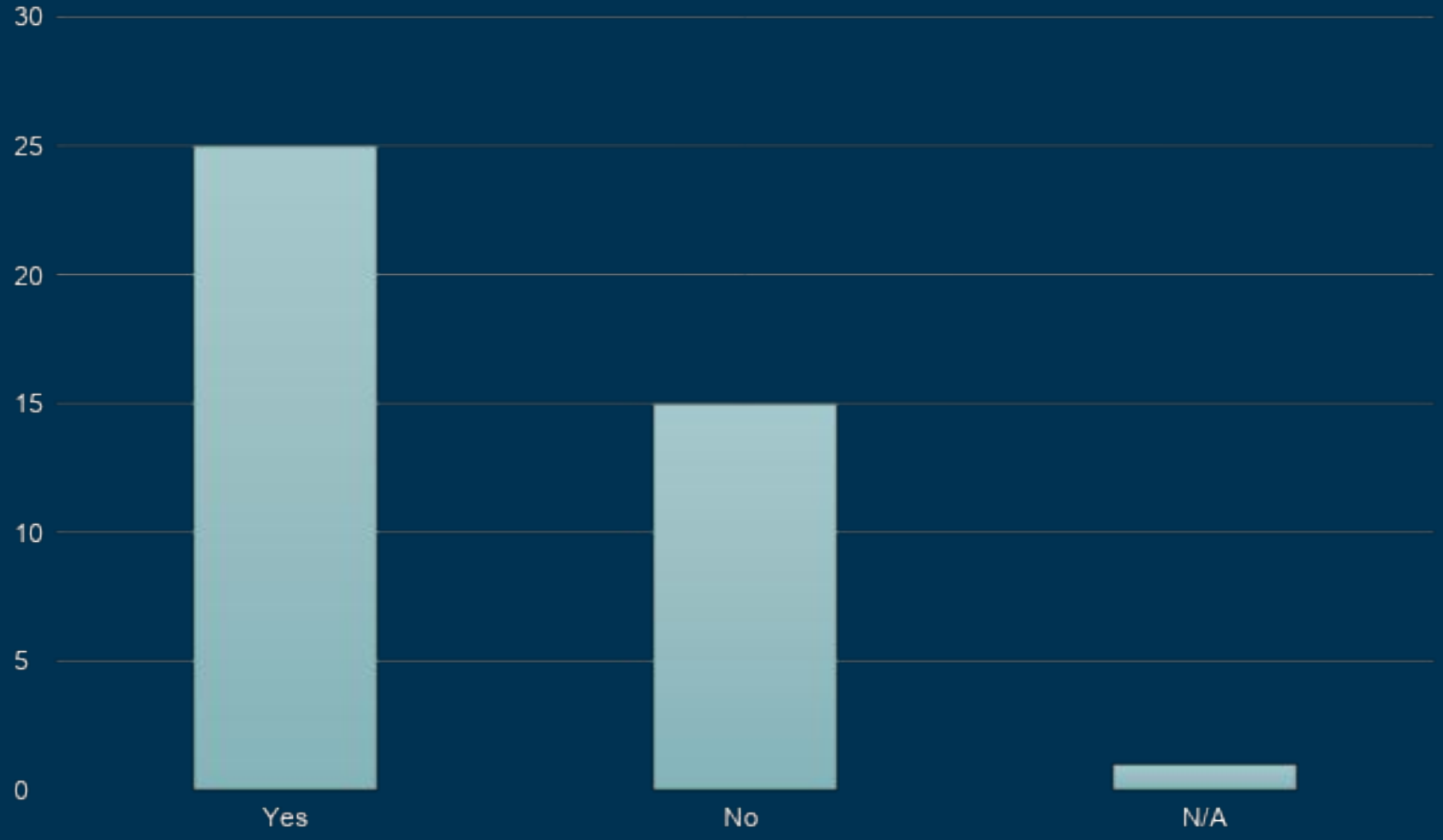
On a scale from 1-5 how difficult was the migration process?



Are you satisfied with the cost of your on-premises solution?



Are the cost to scale up or upgrade services acceptable?



Competition is a factor in my decision to adopt Cloud technology?

“Yes, when taking into account client's budgets, we need to make the right decision and costs are in par with risks”.

“Competition only to attract good engineers that want to work on a modern cloud platform.”

SWOT

Strengths

- Data stored in one central point (Cloud).
- Vendor of the cloud is responsible for security.
- Availability of the data by everyone who has access to the cloud.

Weakness

- High-speed internet connection is a necessity
- It is impossible to physically control a dat.
- Small business dependable on internet connections.

Opportunities

- Standarized organization and process.
- New job position created to maintain and run business in clouds.
- A cloud work environment is defined as high technology.

Threats

- Loss of data because everything is stored in one central point (cloud).
- Difficult to migrate from cloud to cloud because of the contractual and vendor commitment.

Conclusion

The benefits of cloud computing in business are not only for businessmen but also, for the customers. Cloud computing has a positive impact on businesses. According to various statistics portals, the total number of cloud-based users is increasing rapidly. The term “cloud” refers to the cloud symbol in the IT industry used to describe an Internet network or Internet cloud Institutions as it increases their revenue and helps them to achieve profit targets. There are many benefits of using cloud computing in business. The companies which are using the cloud today are completely satisfied with it. Because it has a very positive impact on their business, it can be easily guessed by looking at revenue growth. Because of the enormous growth of this cloud technology, all types of companies are now aware of the benefits of Cloud Computing in Business. All computing services resources include applications, servers, data storage, security, network tools, etc., and are hosted at the remote data center of the cloud service provider. However, 20 years ago very few people knew what is cloud computing services, how they work, and how it is beneficial for businesses. But now things have changed completely, people are aware of cloud computing.

I think this is the best technology, and all big and small businesses should use it. Cloud computing is on-demand access and the delivery of multiple services through the Internet. The main benefit of using cloud computing services is that business enterprises can substantially reduce the initial cost and complication of buying or maintaining their own IT infrastructure.

Thank You

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