

CLOUD COMPUTING INDIA JOB MARKET REPORT 2018

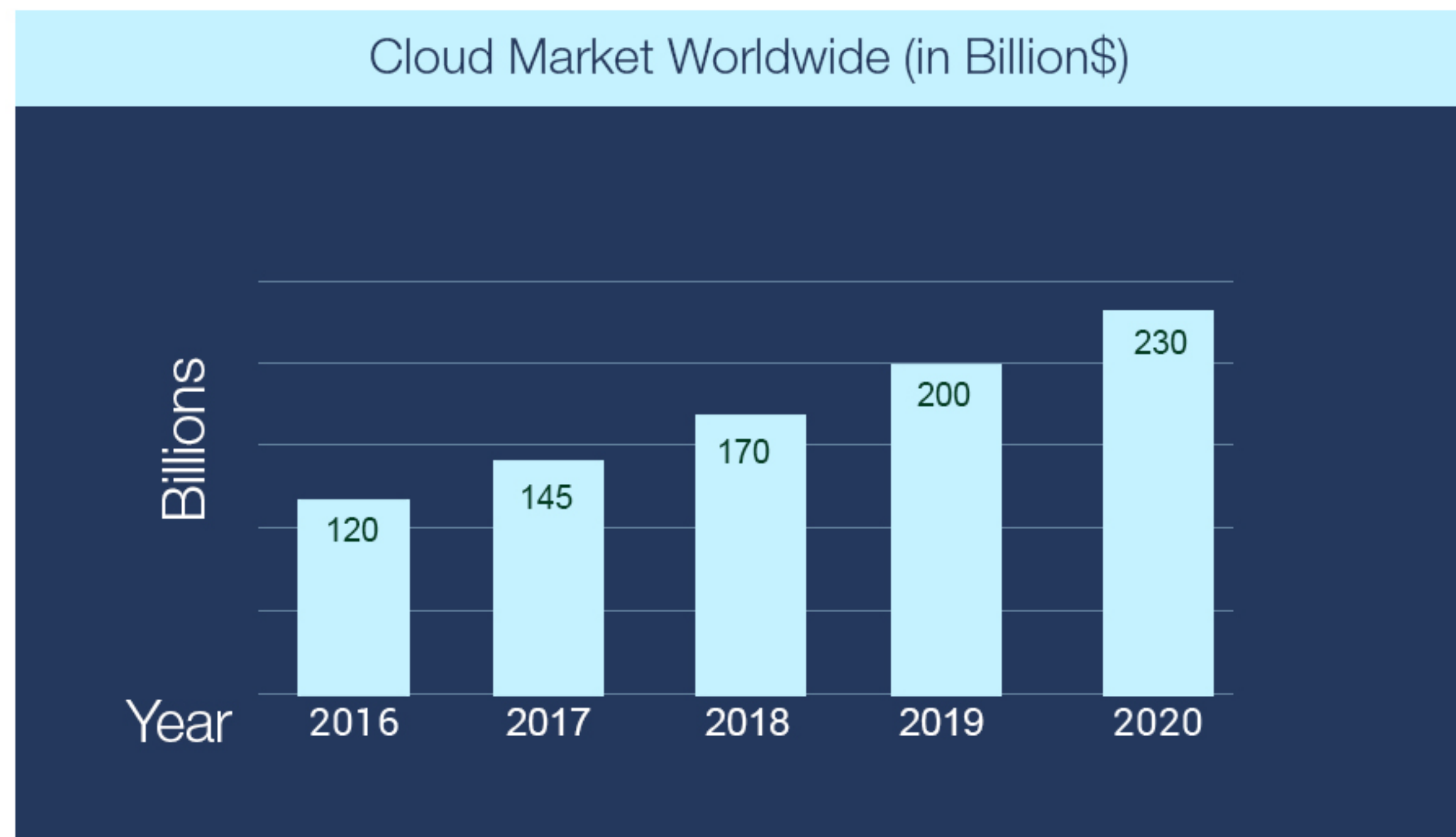


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The Cloud Computing Market

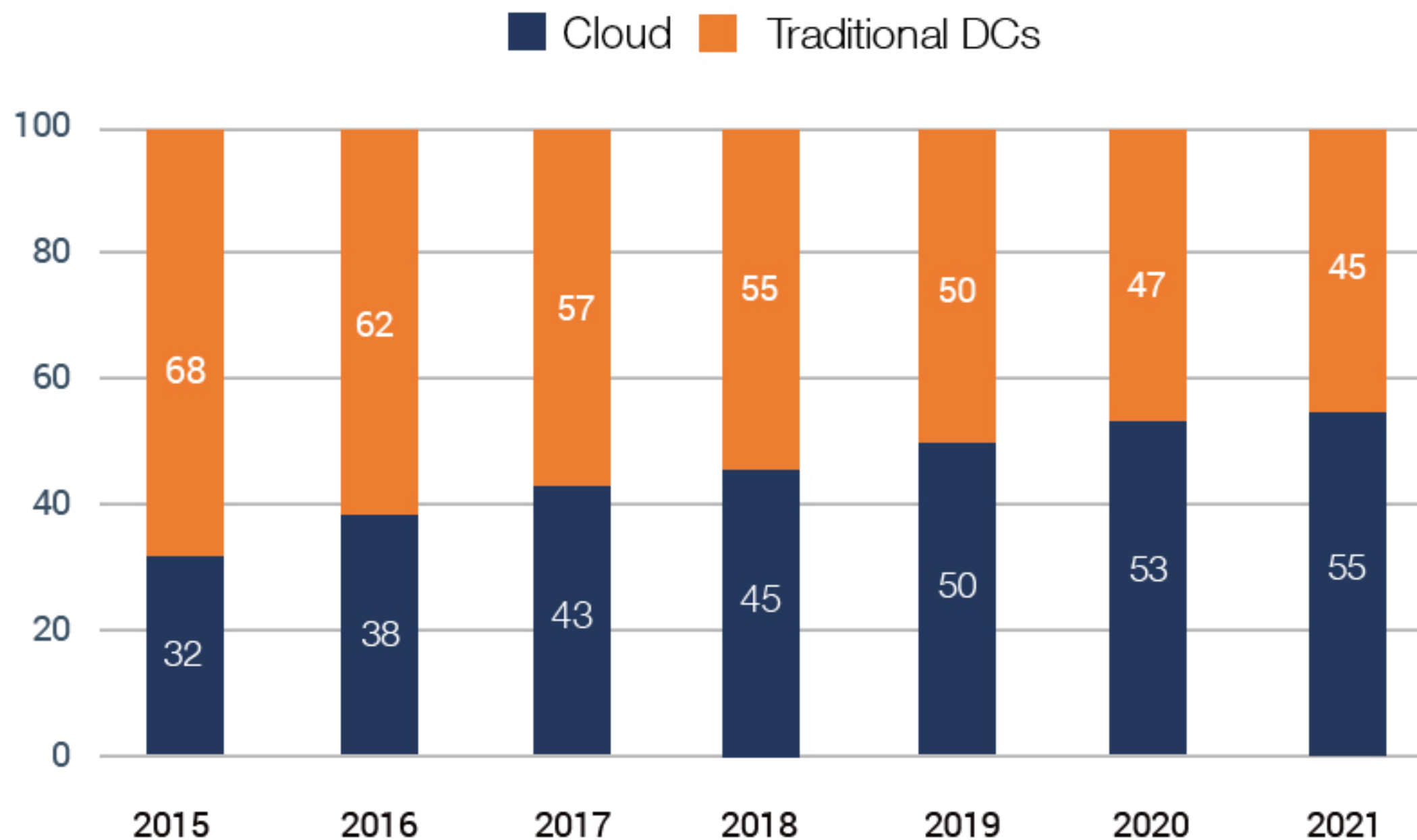
Just a few years ago, not many would have predicted the heights to which cloud computing would reach by 2018. Now, businesses and IT executives are no longer looking at cloud computing solely as an efficient infrastructure model, but as a major enabler to accomplish their business goals. With cloud computing becoming more prevalent in companies large and small, the global requirement for cloud professionals is steadily on the rise. The cloud market – a nearly 200B\$ market worldwide is expected to grow at 17% over the next 2 years to top 230B\$ by 2020. The investment that companies are making in cloud infrastructure is currently 4.5 times the rate of traditional IT spending (annual) and is expected to grow even faster by 2020.



The Cloud Computing Market

The proliferation of cloud-native services and increasing acceptance of cloud-based environments as secure coupled with a need to save costs are driving companies away from traditional data centres (DCs) to cloud environments at an ever increasing rate.

Cloud Adoption - Worldwide (in%)



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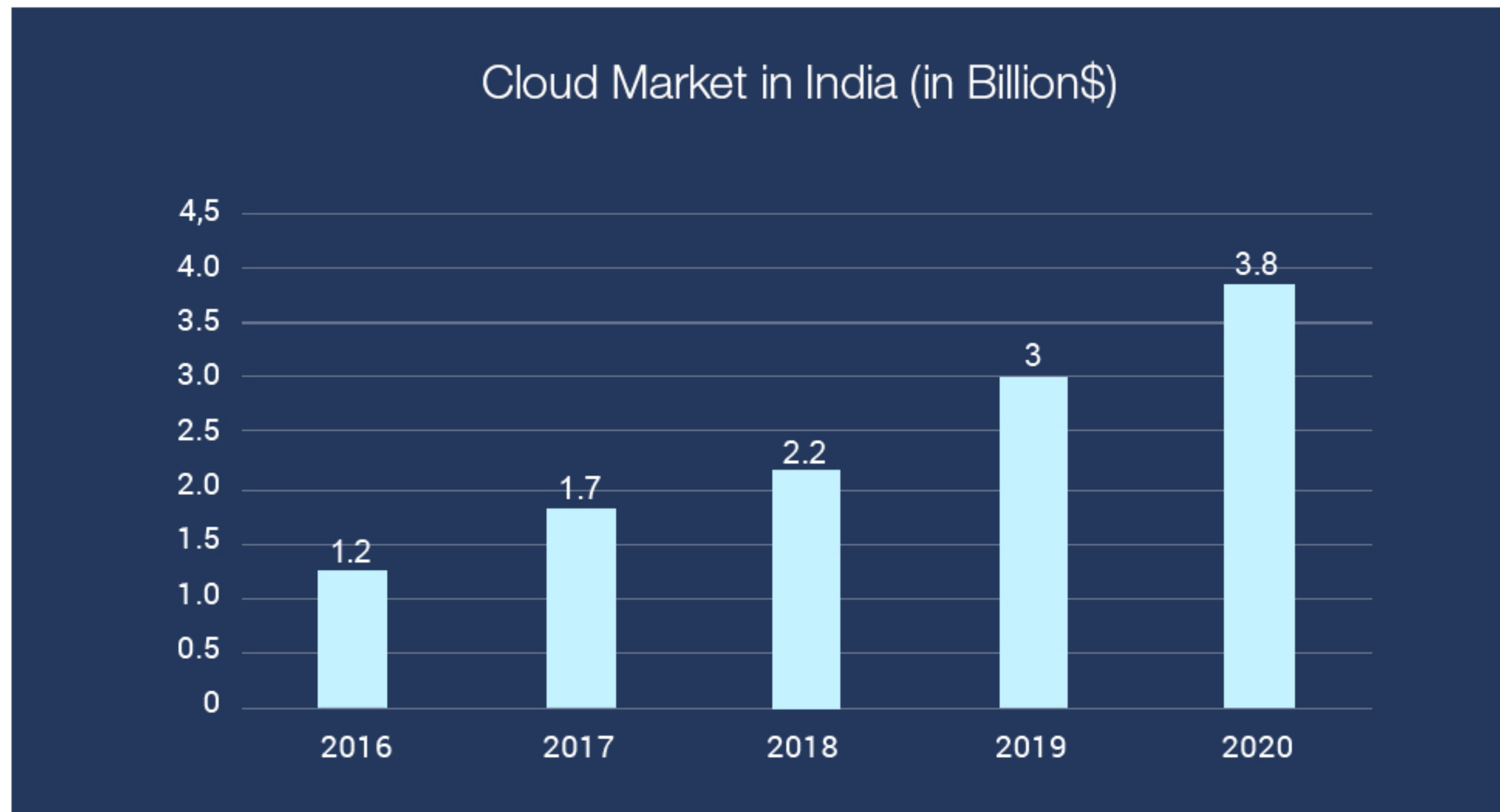
Organizations are pursuing Cloud Adoption strategies because of the multidimensional value of cloud services, including values such as agility, scalability, cost benefits, innovation and business growth.

- Sid Nag
Research Director at Gartner.

”

The Cloud Computing Market

This large and growing market is not limited to the western world. The Indian cloud computing market, currently at \$2.2 billion, is growing rapidly and is expected to grow to \$4 billion by 2020 with an annual growth rate of more than 30%.



The demand to migrate data to the cloud for accommodating compute-intensive workloads is a major accelerator of this growth. The largest cloud service providers, the likes of Amazon, Microsoft, Google and IBM have invested heavily in building the infrastructure for offering cheap and better cloud services.

How Good is the Job Market?

According to Forbes, there are about 18 million Cloud Computing jobs worldwide at the moment with a median salary of over 100,000USD p.a. In the coming years, however, nearly all IT expenditure will be on a private, public or hybrid cloud environment – making all IT roles, in some sense, Cloud computing roles.

In India, IT giants like Cognizant, TCS, Infosys, HCL and Tech Mahindra are increasingly building solutions (and products) on the cloud - rather than on physical infrastructure – owing to increased flexibility, scalability and speed. **IDC quotes “An estimated 1 million new jobs will be created in India by the year 2022 as more companies adopt cloud technology”**. A quick search on popular job boards shows hundreds of open jobs in various roles in India that require cloud computing expertise.

ROLES	OPEN POSITIONS
 System Engineer	About 1000
 DevOps	900 – 1000
 Cloud Database Admin	800 – 900
 Cloud Network Engineer	700 – 800
 Cloud Architect	600 - 700

Large technology service providers, especially those focused on cloud migration and integration projects, are also the largest recruiters in this space. A sample search of the companies with the most open jobs in cloud computing at the moment yielded the following list:

► Accenture	► Oracle
► Mphasis	► Deloitte
► SAP Labs	► Adobe

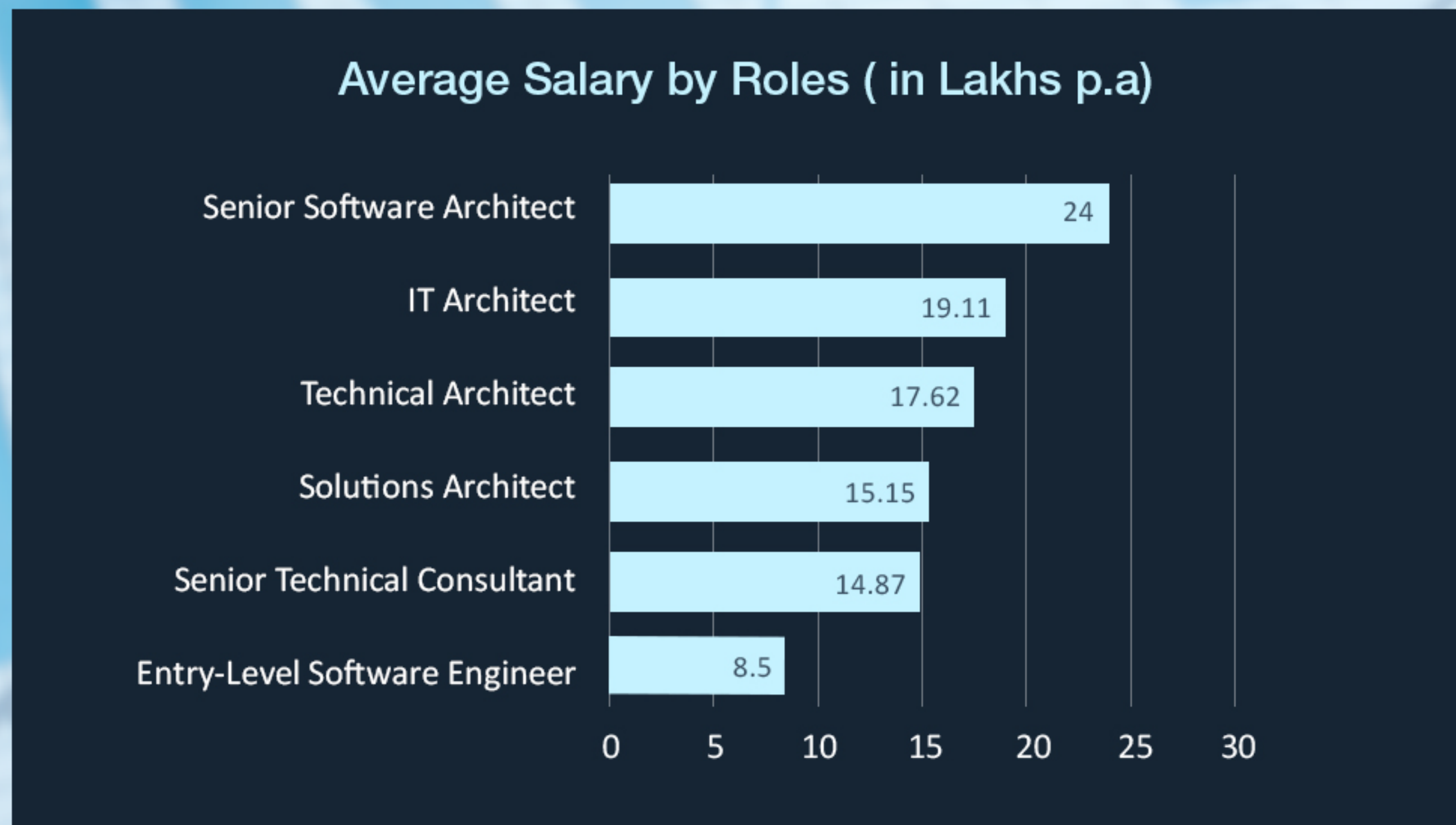
“ We want to be the No. 1 player in the cloud computing space. So you will see us accelerate our investment and hiring 300 cloud professionals is part of that strategy to sell our range of cloud offerings in the country ”

Shailender Kumar, VP of Oracle India.

How Lucrative are These Jobs?

Cloud computing began to take off about a decade ago and cloud experts command a higher pay as the demand outstripped available expertise. The average salary for a cloud professional in the global market is above 100,000 USD p.a. The salary for a leading cloud professional can go as high as 2,80,000 USD per annum.

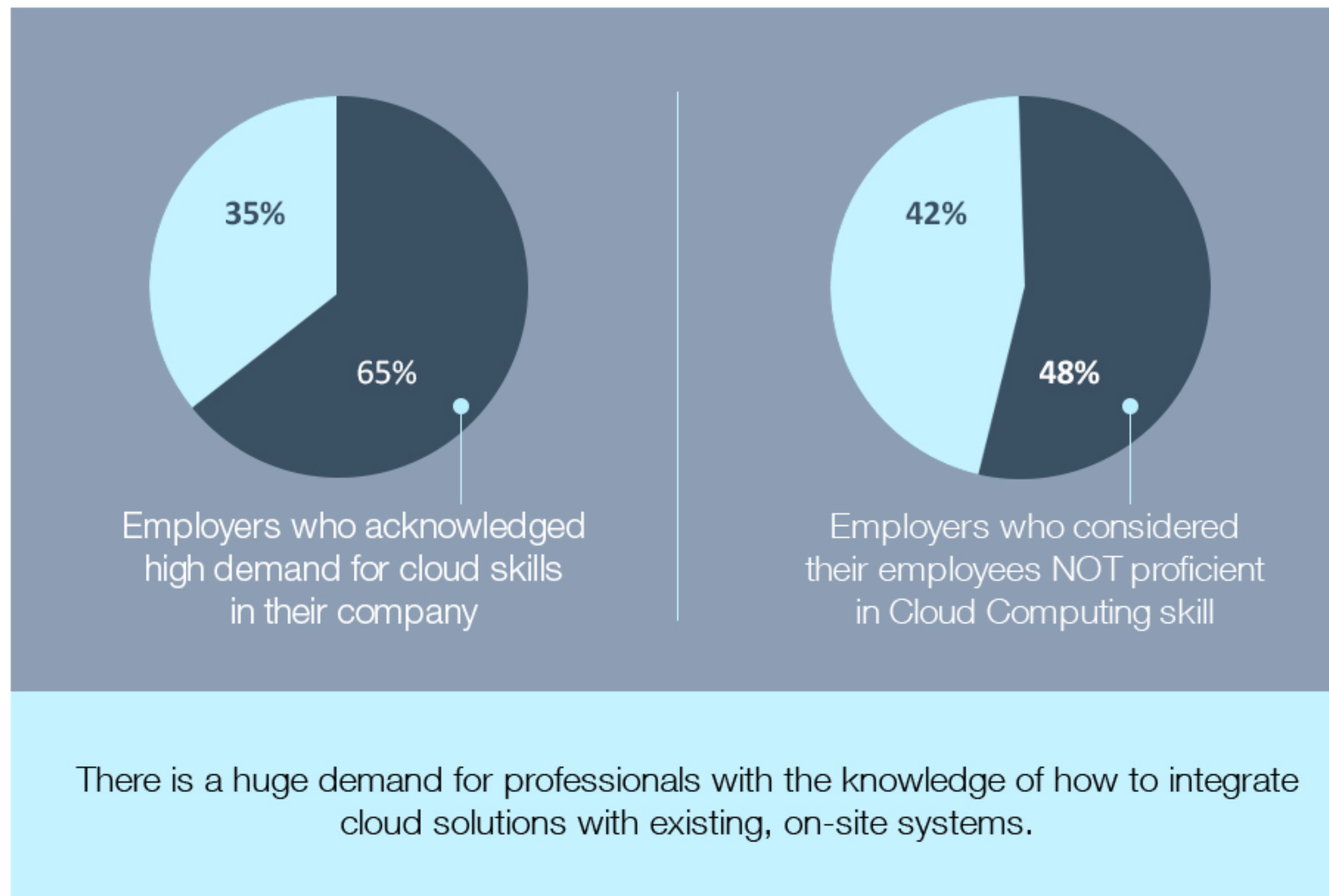
In India, the salary for an entry level (0-2 years of experience) cloud professional is around **5 to 7 Lakhs** which is significantly greater than that of a traditional IT engineer, who would earn around **5 Lakhs**. The salary for an associate working in cloud with less than 5 years of experience can range from 12 to 19 Lakhs. A mid-level manager can easily command upwards of 20 Lakhs. Cloud Architects and other specialists with 10 to 15 years of work experience can earn upwards of 30+ Lakhs. As an indication, Oracle has been known to pay senior cloud professionals with 15 – 25 years of experience up to 1 Cr. p.a.



Are There Enough Certified Cloud Professionals?

More than 1.7 million cloud jobs worldwide remain open as technical recruiters face difficulties in filling out job vacancies. **An IDC report says** “There is only one qualified candidate for 100 job postings and the reason for such a gap is because applicants lack training, certification and hands on experience to work in a cloud-based environment”.

The report further added, “Unlike IT skill shortages in the past, solving this skills gap is extremely challenging, given that cloud brings a new set of skills, which haven’t been needed in the past. There is no one-size-fits-all set of criteria for jobs in cloud computing”. This skill gap comes at a time when almost two-thirds of global enterprises are planning, implementing, or using cloud computing; and more than 50% of businesses agree that cloud computing is a high priority.



Businesses are in a tricky situation, because it is very difficult to hire for these skills, and training only gets you the theoretical knowledge – not the practical experience

McQueen
Director of Microsoft Practice at Softchoice.

”

Companies are looking for folks with the knowledge of how to integrate cloud solutions with existing, on-site systems. Migration, integration, developer knowledge of different cloud providers, application programming interfaces (APIs) are all skills that are in high demand

- Robinson CompTIA's
Director of Technology Analysis.

Cloud Roles in Demand

1. Cloud Enterprise Architect

A Cloud architect is responsible for devising and implementing a company's cloud strategy. They make infrastructure choices and lead the migration of applications to the cloud.

Key Skills Required

Understanding business requirements, building and maintaining global scale infrastructure, PaaS, SaaS, IaaS and Security



2. DevOps

DevOps engineers automate the deployment and integration of software, working closely with developers and infrastructure professionals to ensure smooth operation. The DevOps approach to software development requires frequent, incremental changes to code versions, which means frequent deployment and testing regimens.

Key Skills Required

Knowledge of tools like Chef/Puppet, Jenkins, CI/CD, Containers, Agile Development, Testing Skills

3. Cloud Software Engineer

A cloud application developer (Software Engineer in the traditional sense) is required to build cloud-native applications either completely or those that partially leverage cloud services. Unlike in traditional software development, a stronger emphasis lies on API consumption, micro services architecture and DevOps in the cloud world.

Key Skills Required

Micro-services, containers (Docker), API etc.



4. Cloud Infrastructure Engineer

A. Cloud Network Engineer

A network engineer is responsible for designing and maintaining networks that support a company's lifecycle and growth. Their work spans across both physical and wireless networks to ensure seamless infrastructure.

Key Skills Required

Building and maintaining global scale, SDWAN, security, DNS, containers.

B. Cloud System Engineer

A system engineer work on supporting large-scale, multi-platform enterprise computing environments. They are responsible for any system troubleshooting that arises during the use of cloud services.

Key Skills Required

Automation, IaaS, PaaS, Kubernetes, DevOps, Containers etc.

C. Cloud Database Admin

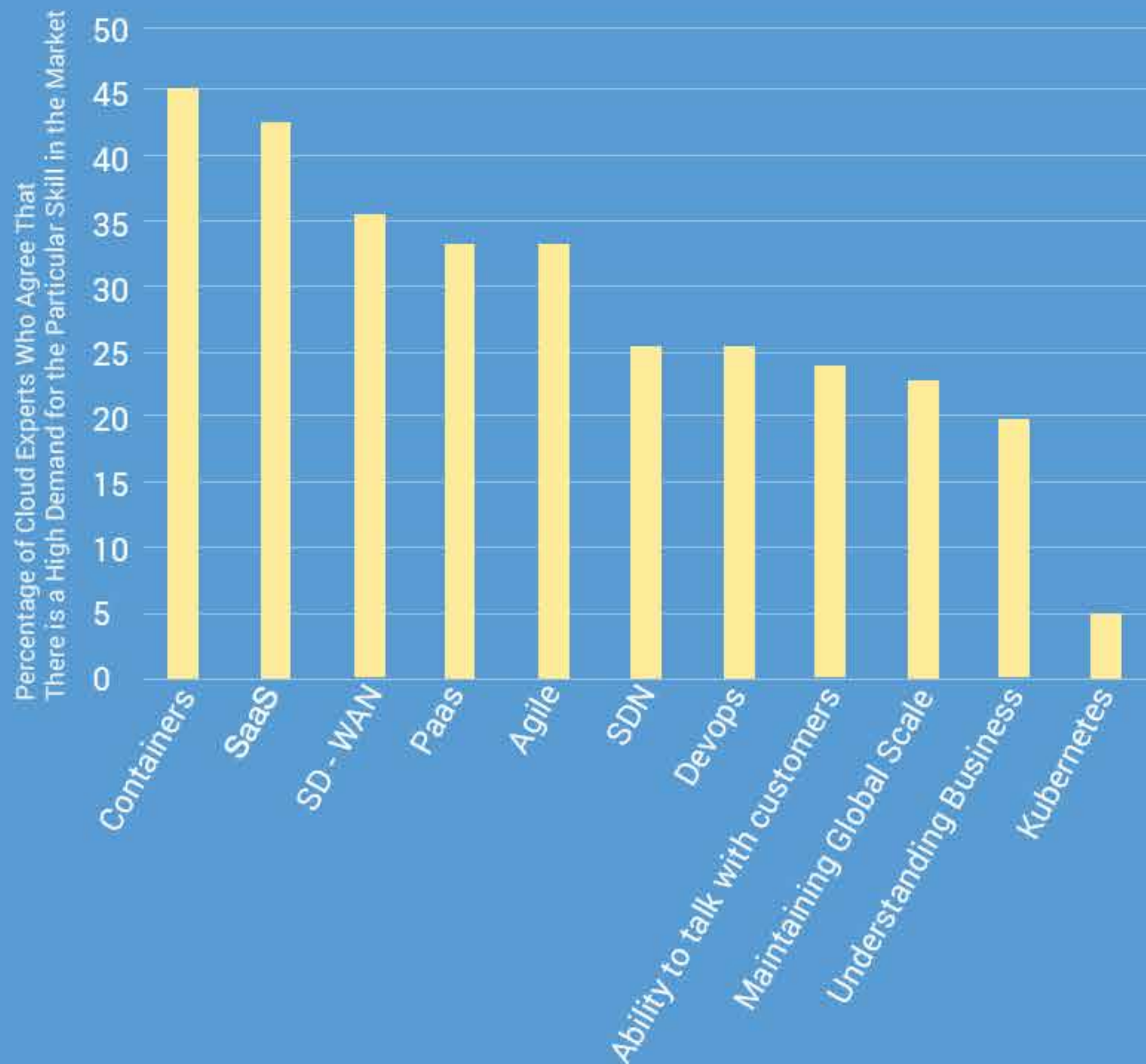
A cloud database admin is responsible for creating backup policies, designing, configuring and monitoring databases in the cloud.

Key Skills Required

Cloud Architecture, Capacity Planning and Knowledge of NoSQL Databases.

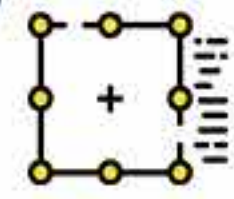
Cloud Skills in Demand

Which of these cloud skills are most important for 2017?



Source: Enterprise Cloud News Special Report on Cloud Skills (Mar'17)

In line with the 'hot' skills, some of the hottest job profiles in the Cloud computing industry are:

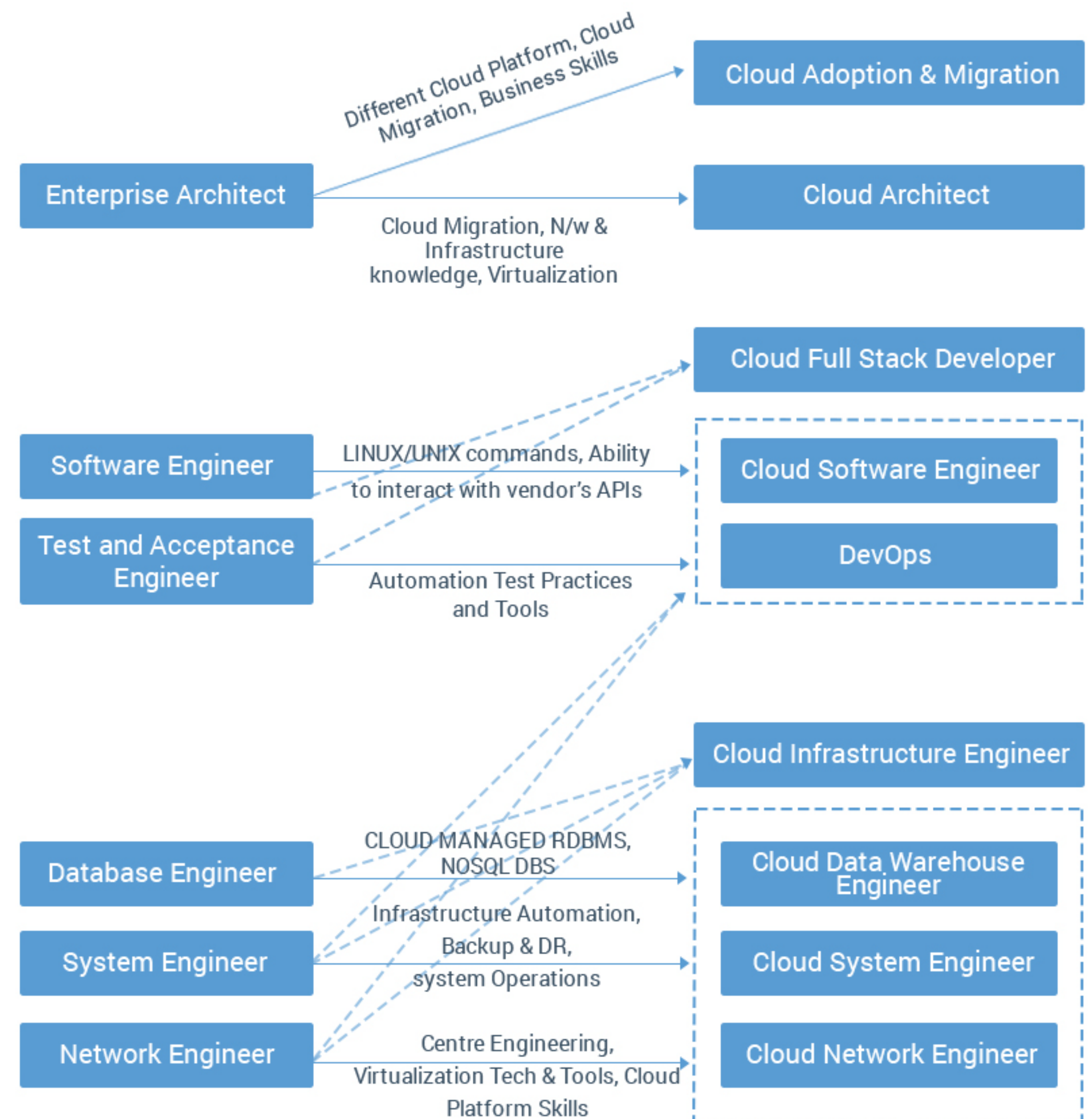
-  DevOps
-  Cloud Architect
-  Software Engineer
-  Cloud Network and System Engineer
(Cloud Infrastructure Engineer)

Transitioning to a Career in Cloud Computing

SERVICES	MARKET	GROWTH RATE (CAGR till 2020)	IMPLICATIONS
IaaS	Mature	25%	Huge growth opportunity
PaaS	Evolving	10%	Nascent platform. Potential job market for future
PaaS	Consolidated	10%	Stable job opportunities with wide variety of roles

There are many paths for an IT professional to transition into a cloud computing specialist. IT engineers need to learn cloud specific tools and automation to keep themselves relevant in the new cloud industry. For example, when a company migrates to cloud, software engineers need to learn cloud APIs, managed services like container platforms to build cloud-native applications. Cloud also offers various opportunities to transition into cross-functional roles. With core services like networking being offered as a managed service by cloud, a network engineer has the ability to acquire additional skills and move into a higher position of responsibility. For example, a network engineer can learn about infrastructure automation, data recovery and system operations to move into a cloud infrastructure role, which offers better pay and job security.

Indicative Cloud Paths



Big Data and Analytics on Cloud

Few years ago, an IT company building a big data project had to either rent or buy big physical infrastructure to process huge amounts of data. This huge initial cost inhibited a lot of companies from working on big data projects. Now, thanks to cloud computing, anyone can rent virtual computing storage of any size, anywhere, and dispose it off anytime almost instantaneously.

Virtual machines capable of working on huge chunks of data can be created instantly with pay-as-you-go services making working on big data projects more viable. In addition, Cloud service providers offer Analytics as a Service (AaaS) – a combination of data analytics and visualization tools that require only limited programming knowledge to work with. This has helped businesses to bypass the infrastructural costs and process requirements necessary for data analysis and has enabled IT teams to spend more time exploring data and working efficiently.

Analytics as a Service (AaaS) has the advantages of lower upfront costs (60%), greater agility, faster time to market (61%), rapid and cost-effective scaling for larger data sets (60 %) and self-service capabilities for users (51%) over on-premise solutions

-IDC

Cloud computing offers interesting opportunities to analytics aspirants as there is less of a technical barrier to move into an analytics-based role in cloud computing domain. However, existing analytics professionals need to learn certain skills to keep themselves relevant in the new cloud world.

Administration

Knowledge of how to administer and use cloud-based Hadoop environments, NoSQL databases, and cloud managed analytics services such as Kinesis, Athena, QuickSight etc.

Development

Ability to stitch various data warehousing, analytical and reporting services to produce meaningful insights using cloud services.

Analysis in Cloud

Managing massive sets of data from distributed and heterogeneous sources across cloud services using analytical algorithms.

Conclusion

Cloud computing is triggering a stunning shift in how businesses operate. These are necessary changes for companies to transition into smarter and faster-paced organizations that can move in lockstep with their customers' rapidly shifting requirements. With technology giants like Accenture, Oracle, Cognizant, TCS having already made a step in the right direction, it is only a matter of time before Cloud Computing becomes a dominant phenomenon.

“Ultimately, the cloud is the latest example of a creative destruction: creating wealth for those who exploit it; and leading to the demise of those who don't”

*-Joe Wienman
(Author of Clouconomics)*



Appendix

- 1 AWS, Google, and Microsoft will capture 76% of all cloud platform revenue in 2018 and 80% by 2020. Microsoft, Oracle, and Salesforce together have a 70% share of all SaaS sales force automation and customer service subscription revenue.
- 2 Amazon Web Services and Microsoft saw the most revenue from the IaaS and PaaS category, IBM and Rackspace from hosted private cloud, and Microsoft and Salesforce were the dominant enterprise SaaS vendors.
- 3 Cisco and Dell EMC were atop the market in selling infrastructure products to public cloud providers—a business that expanded by roughly 13 percent for the networking, server and storage giants.
- 4 By the end of 2018, spending on IT-as-a-Service for data centres, software and services will be \$547B. Deloitte Global predicts that procurement of IT technologies will accelerate in the next 2.5 years from \$361B to \$547B. IaaS shows no sign of slowing down in the foreseeable future, and is expected to reach \$71.55 billion by 2021 with a CAGR of 29.7%. If IaaS maintains this growth rate through 2021, it will likely surpass software-as-a-service (SaaS) to become the 2nd largest segment of the cloud industry sometime in the next decade, behind Cloud Advertising only. According to the same Gartner report, SaaS is forecasted to grow to \$75.73 billion by 2021 with a CAGR of 18.4%.
- 5 Although much smaller than SaaS and IaaS, platform-as-a-service (PaaS) is expected to grow at a formidable 23.5% to reach \$8.85 billion by the end of 2017. By 2021, Gartner expects PaaS to increase by a CAGR of 19.9% to a total market size of \$14.80 billion.
- 6 Google Cloud also provides simple access for network services and built-in software-defined networking. Typical networks require careful planning of configurations, service chaining, and security policy enforcement. This becomes challenging as engineers combine the behaviour of physical devices with logically defined policies. Google Cloud leverages SDN, so the underlying capabilities are easily exposed to enterprise users through user interfaces or APIs.

Shifting Responsibilities

Does this mean there is no role for the network engineer in maintaining cloud provider networks like Google Cloud? Of course, there is work, but it is different. While the work to keep the network plumbing, running, and stopping any leaks is now handed off to Google, network engineers' responsibilities are shifting towards ensuring business requirements are met. Google's network gives you a toolkit on which network engineers configure policies to meet users' needs. This still requires a good understanding of networking technologies, such as IP subranges, but engineers will need to spend less time dealing with details.

Integrating disparate systems is a skill that a good cloud-aware network engineer can bring. Networking professionals are recommended to understand how networking works in a CSP, ensure it meets business needs, and understand how to bridge that with existing networks.

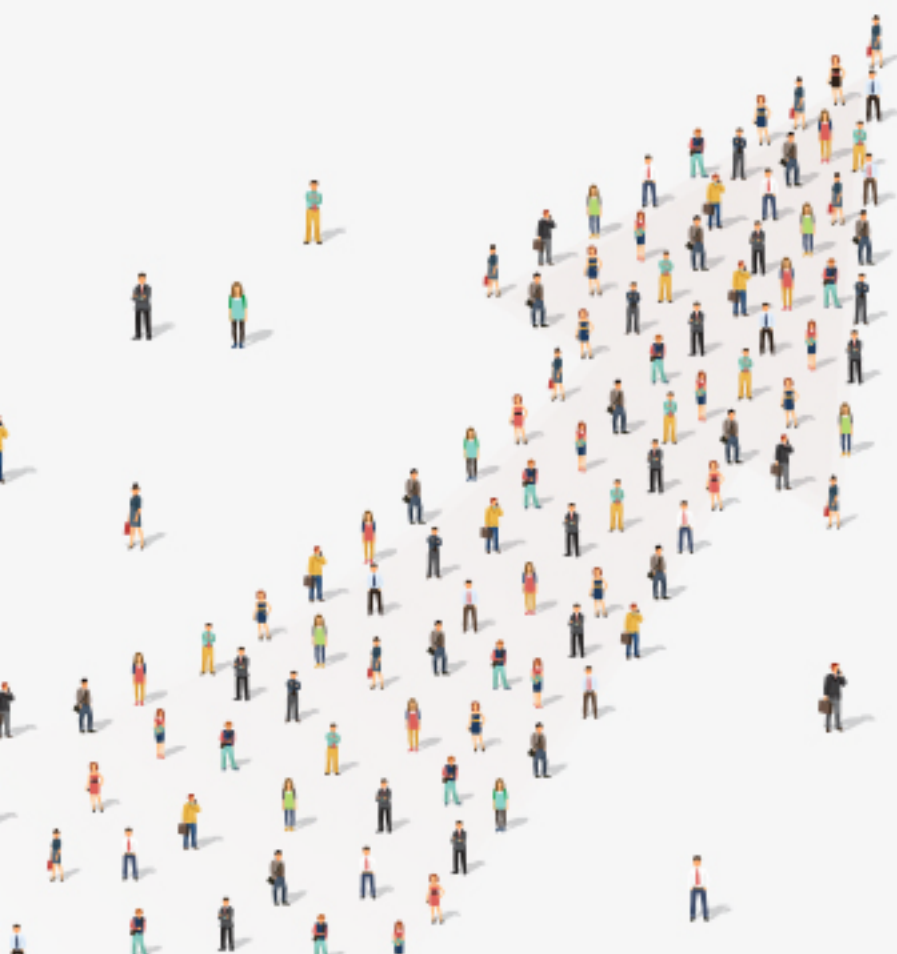
A new role in the cloud space is that of an enterprise cloud architect, an expert who understands both IT infrastructure and applications, and can design and manage application frameworks and operations.



This is different from traditional IT services where the developer only bothered about developing the application and the infrastructure engineer only worried about maintaining the IT assets



Kalyan Kumar,
Senior Executive from HCL Technologies'
Infrastructure Services Division

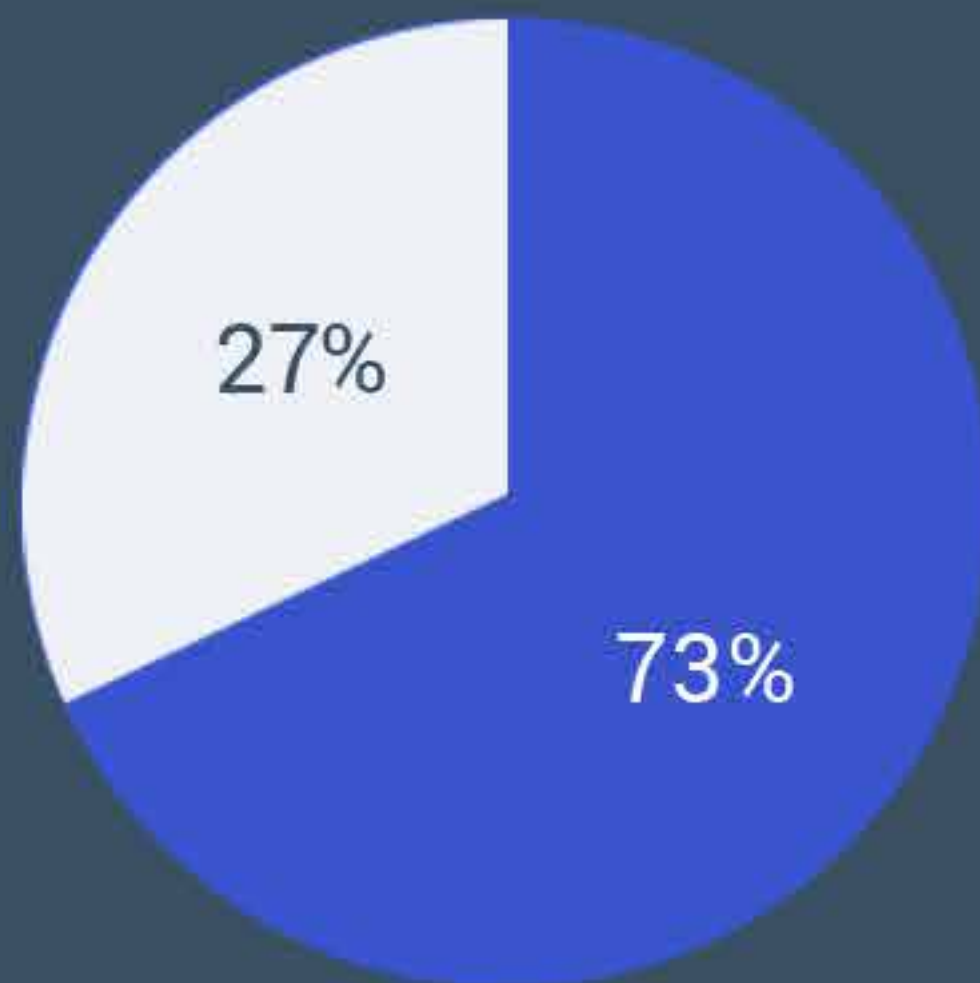


Cloud Reigning in Various Domains

Besides technical jobs, marketing and selling of cloud-based solutions has created a host of new positions. Cloud computing is giving rise to a new generation of software product companies, which can now sell their products on demand basis over the Internet.

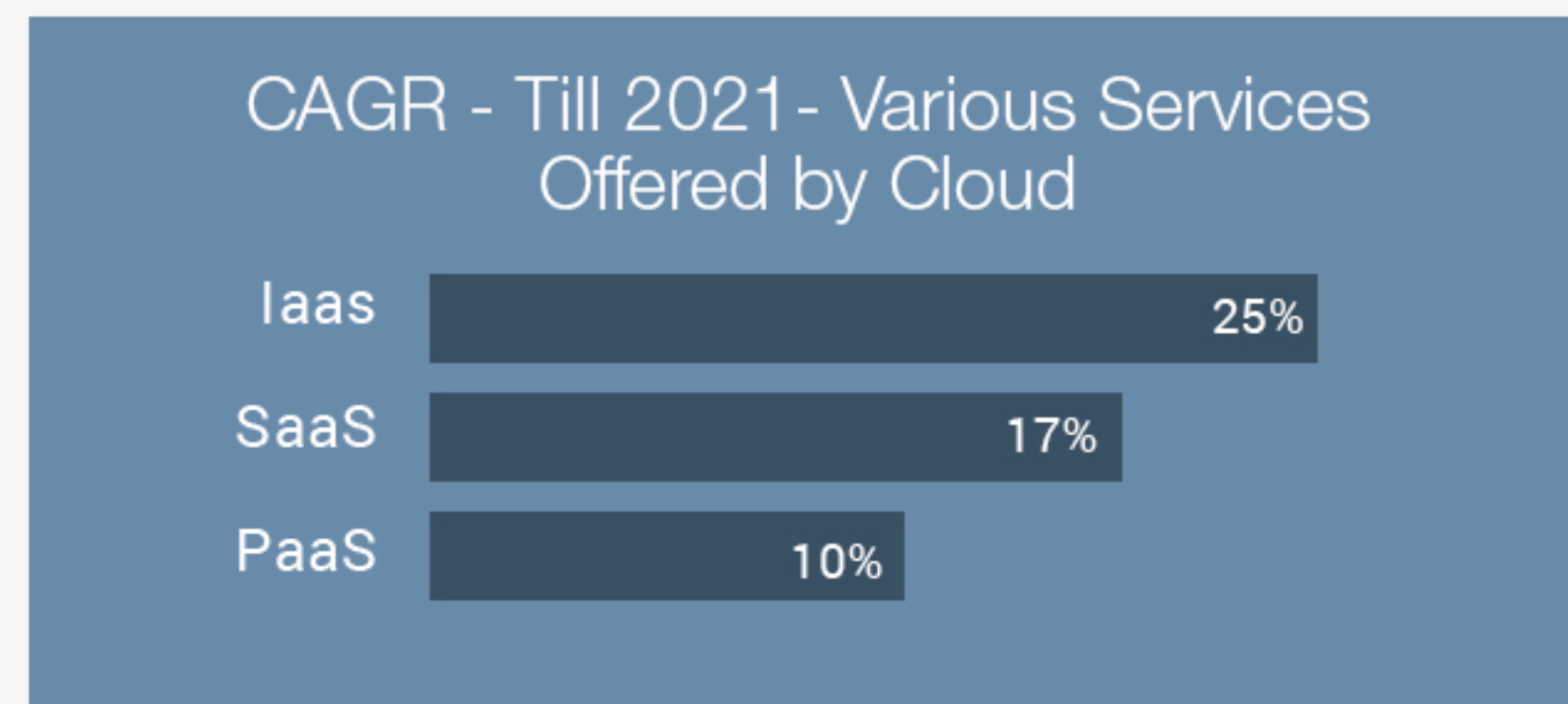
Open Job roles paying \$100+ a year
where cloud expertise is a requirement

■ Software & IT System
■ Sales & Marketing

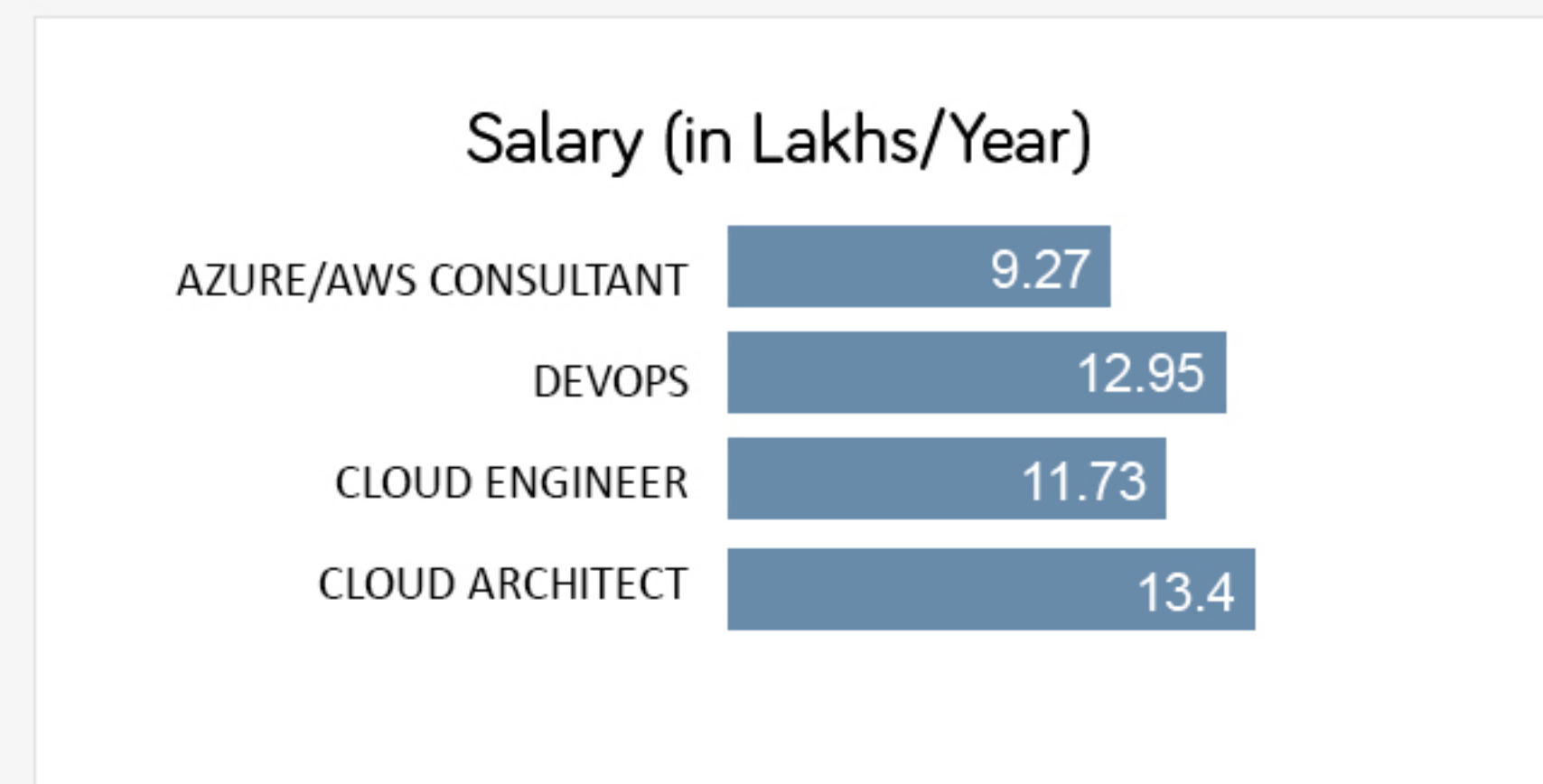
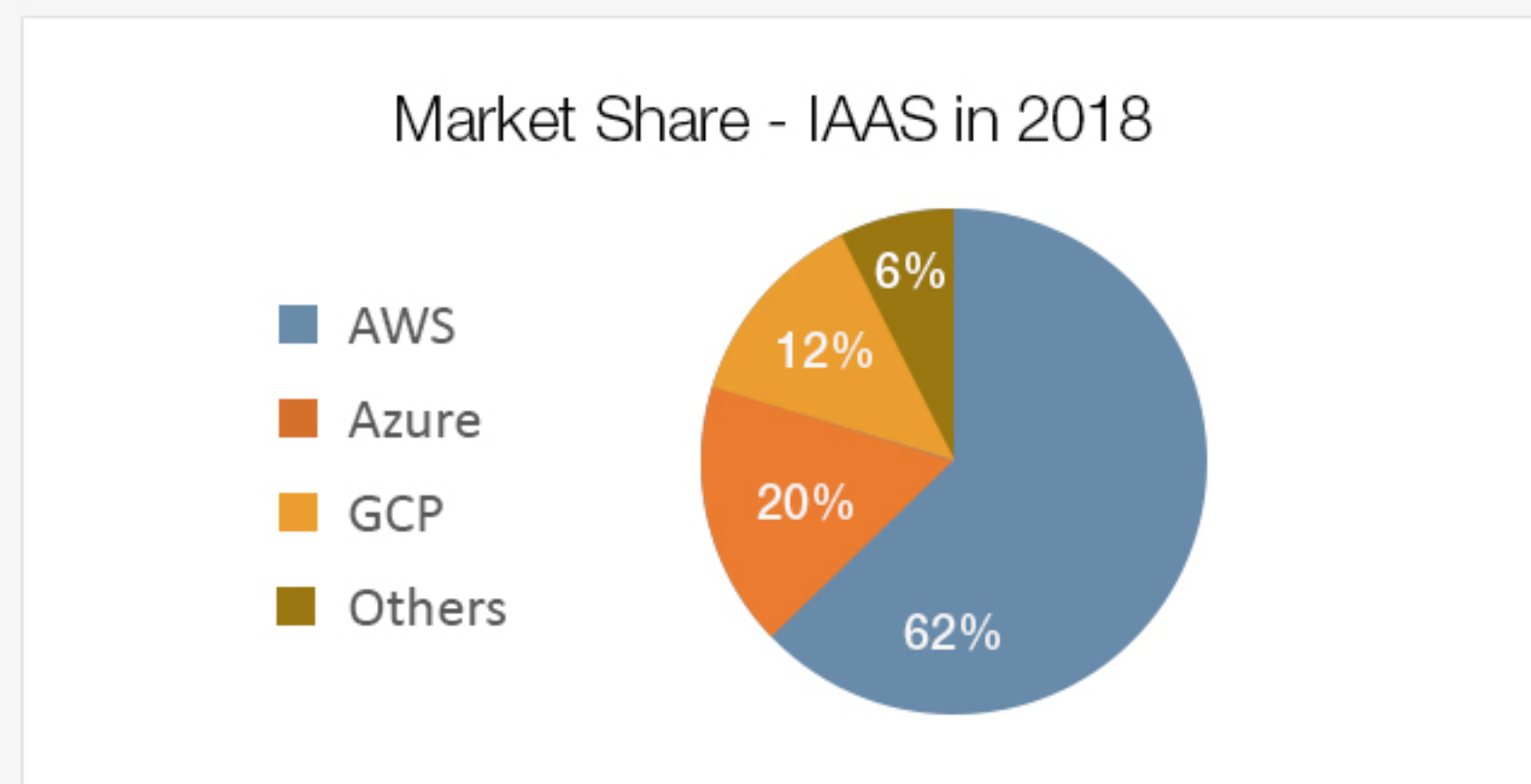


Which is the Hottest Platform in Cloud?

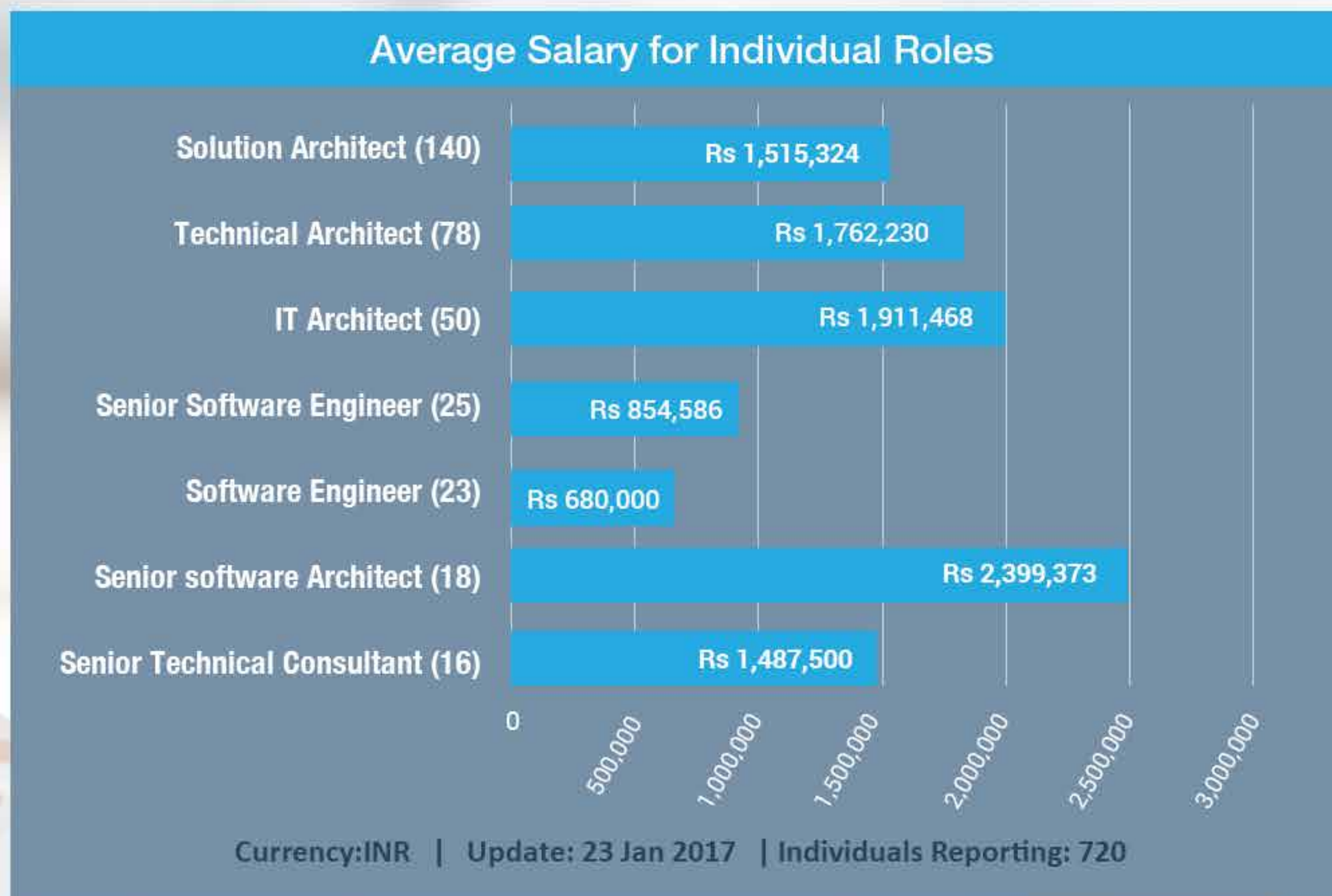
Within major services offered by the cloud, providing infrastructure as a service (IaaS) has the highest growth rate of 25%. Catalysts driving greater adoption and correspondingly higher CAGRs include a shift in infrastructure, middleware, application and business process services spending. It is majorly dominated by players like Amazon and Microsoft. So, one needs to master these services offered by the global players to make a successful career transition to Cloud.



Amazon is the clear leader in the IaaS market with 62 percent share of the market. Amazon has achieved this position by serving customers across the broadest range - from cloud-native start-ups to midmarket businesses' transformational migrations to the cloud. Learning Amazon Web service is one of the essential platforms one would require to transition their career to cloud.



Job Opportunities in Cloud



COMPANIES	JOB OPPORTUNITIES IN 2018
Accenture	277
Mphasis	81
SAP Labs	83
Oracle	53
Deloitte	23
Adobe	53

Key Technical Skills Required for a Direct Transition:

- 1 **Cloud Software Engineer** - Experience with cloud computing technologies like - AWS, Azure, Knowledge of Cloud Architectures - IaaS, PaaS and SaaS. Experience in Docker, Experience in Python, Design and interact with Cloud Databases
- 2 **DevOps** - Knowledge of Automation tools, Experience with Server Migration, knowledge of networking technologies and production level infrastructures, Agile and Continuous Integration, Docker and Containers
- 3 **Cloud (Network) Engineer** - Experience on virtualisation environment, Load Balancing, cloud architecture and operations, storage software like resource management, backup, Experience in migrating workloads to the cloud, Linux administration, Docker.
- 4 **Cloud System Engineer** - Various Cloud Technologies, Cloud security, Experience with system monitoring tools, install new/rebuild existing VM servers and configure hardware, Ability to analyse and resolve application deployment issues.
- 5 **Cloud Database Admin** - Design, configure and manage Data Warehouse Database Systems such as AWS Redshift, database administration tasks including backup and recovery, Evaluate new database technologies.
- 6 **Cloud Architect** - Knowledge in design, deployment of infrastructures for cloud based multi-tenant services, Knowledge about containers and Docker, Knowledge about Architecture and design patterns.

About Great Learning

Great Learning is an ed-tech company that offers programs in career critical competencies such as Analytics, Data Science, Big Data, Machine Learning, Artificial Intelligence, Deep Learning, Cloud Computing and more. Our programs are taken by thousands of professionals every year who build competencies in these emerging areas to secure and grow their careers. We are on a mission to make professionals proficient and future ready. We do so by creating industry relevant programs and crafting learning experiences that help candidates learn, apply and demonstrate capabilities in these high-growth areas.

What Sets Us Apart

We believe learning a new skill is tough and high quality education has to be rigorous. This is why none of our programs are superficial or trivial. Every program and every lecture that gets delivered through any of the programs values the time, effort and dedication of our learners. This is why they are designed to be meaningful and impactful. And because learning a new skill is tough, a core part of the learning experience is the learning assistance provided to candidates. We use technology, content and a wide network of industry experts (Great Learning Gurus) to help candidates learn in the most impactful manner, whether it be through in person classroom sessions or our unique model of 'assisted online learning'.

Impact

- ▶ Over **5000+ professionals** have taken Great Learning programs and we have delivered **3+ million hours** of learning.
- ▶ We have a network of **300+ Great Learning Gurus**, all of who are industry experts engaged in teaching, guiding and mentoring our candidates through our programs.
- ▶ Our analytics programs have been ranked as **India's best program** for 2015,16 and 2017. *(by Analytics India Magazine)*

#Learning for Life

'Learning for Life' establishes that as professionals, we all need to partake in lifelong learning. Constant up-skilling of one's skills and competencies is the only way that professionals can keep themselves relevant and in-demand for the careers of tomorrow. And at Great Learning, it is our endeavor to be professionals' trusted learning partner for life. Also, 'Learning for Life' as a message alludes to a higher purpose urging all of us to be lifelong learners, so that with every passing day, we become a better version of ourselves.

Our Cloud Computing Program At A Glance

PG Program in Cloud Computing is a 6-month exhaustive program offered online with Live interactive mentoring sessions on weekends. PGP-CC is focused on empowering technology professionals for fast-track careers in Cloud and Distributed computing. The program goes well beyond preparing you for certifications. It builds a sound foundation with hands-on coverage of essential topics such as Cloud Essentials, Cloud Architecture, Cloud Service & Deployment Models, Virtual Machines & Containers, Cloud Adoption, Migration, and Economics, as well as working on cloud platforms as Developer, DevOps, or Architect.

IT professionals not already working with cloud technologies gain a solid foundation while those with some Cloud experience gain a more structured and hands-on understanding of Cloud technologies, including issues such as migration, deployment, integration, platform choice, architecture, and TCO. The program helps you become proficient in working with a range of Cloud environments.

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