

Cloud Analysis

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Goals Today

- Have a base level understanding of **what cloud is**, how we can use it to our benefit, and some of the security considerations.
- Focus on the **role of the Business Analyst**; their responsibilities, tasks, and what it takes to help them succeed in a Cloud Computing project.
- Ask / answer questions to ensure knowledge and understanding of the core concepts, principles, benefits, risks, challenges, learning needs, and most importantly **business value** of cloud computing solutions.

Who uses cloud?



What is cloud?

A **global** network of **remote servers** that each have a specific function such as storing data, running applications, or delivering content. Accessible **online via local network or the internet**, making the service available wherever you are and **on demand**. Can be **public, private, community or hybrid** and classified as compute, storage, networking, or service into **IaaS, PaaS, and SaaS**.

OR....

The outsourcing of technical duties to a vendor that can be responsible for the repetitive, non-value tasks of your business.

OR....



There is no cloud
it's just someone else's computer

What is cloud?

Simply, and most importantly:

- Managed by a vendor / service provider
- On-demand, rapidly allocated
- Elastic
- Self-healing
- Take advantages of economies of scale and multitenancy
- Redundant, geographically distributable
- Pay by use, itemized and directed billing to end user
- Services offered either publicly or privately (or hybrid)

IMPORTANT

What do you do on the cloud?

- Compute, storage, networking
- Run applications/websites
- Rapid development for software
- Long term storage of data for analytics
- Webservices/APIs
- Play games, music, videos
- Backup location for data or applications
- Mine bitcoins on other users' unsecured clouds ☺



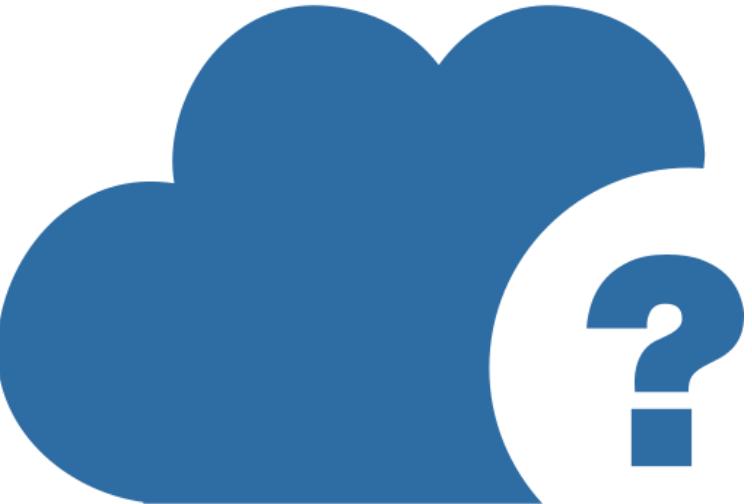
Compute



Network



Storage



How can we deliver services faster and safer to our clients, staff, and citizens?

Applications and services provide the real value to a user

Automate deploys and testing

Some vendors are no longer supporting on-premise traditional installs for software and are moving to cloud-only

Cloud offerings will be (or already are in some cases) more secure than on-premise

Momentum for machine learning, NLP, and AI services to be delivered

Why Cloud?

Deployment Models

Public cloud: In a public cloud, the Cloud Service Provider (CSP)'s infrastructure and resources are available to the general public over the Internet. The CSP's infrastructure is completely external to the customer's organization. (E.g.: MS Azure, Amazon Web Service, Google Cloud Platform)



Microsoft
Azure

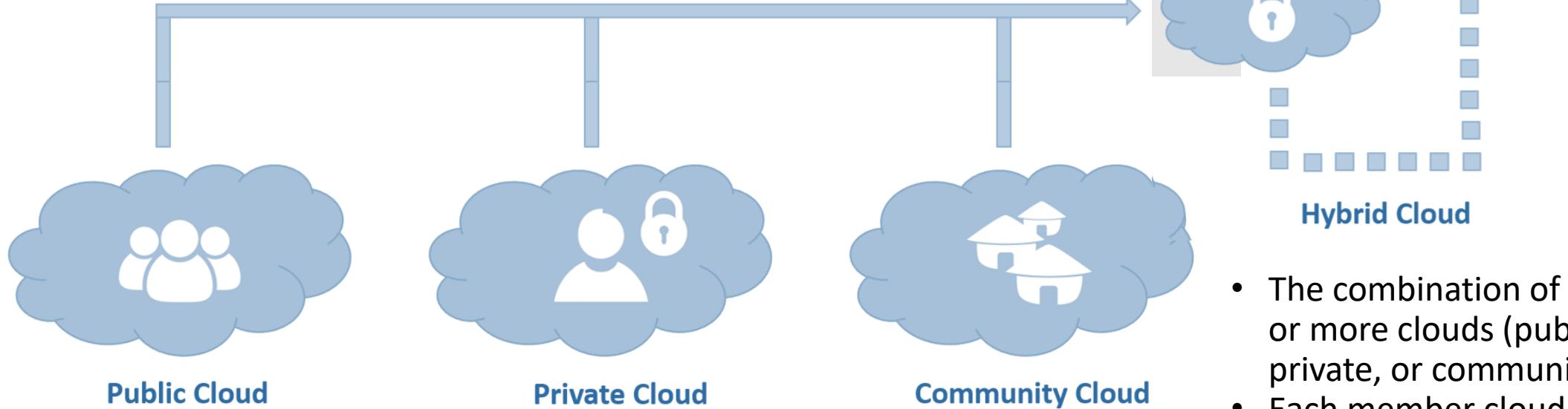


Google Cloud



Alibaba Cloud

Deployment Models



- Available to the general public over the Internet
- Completely external to the customer's organization

- Environment operated specifically for one customer
- May be managed by the customer or the cloud provider
- Greater security and privacy
- Much greater cost

- Shared cloud environment
- Established by organizations have similar privacy, security, and regulatory requirements

- The combination of two or more clouds (public, private, or community)
- Each member cloud remains a unique entity

Cloud Benefits / Risks



Benefits

- Reduced costs
- Flexibility/Scalability
- More options through services
- Improved integrations
- Backup regions, disaster recovery, higher availability
- Costing (Opex vs Capex)
- Security (ISO 27000, ITSG-33, SOC2)
- Modern hardware, continuous improvement
- No need for physical footprint for your own datacenter

Risks

- Cost certainty / increased costs
- Data sovereignty/residency
- Fewer/no customizations (e.g.: SaaS)
- Internal staff skillset, misconfiguration
- Downtime (ex: AWS 2017, Azure Jan 2019, GCP Jul 2018, Azure DNS May 2019)
- Security, data leaks, intrusion, zombie mining
- Storage can be higher latency/less bandwidth
- Culture/change
- Vendor lock-in

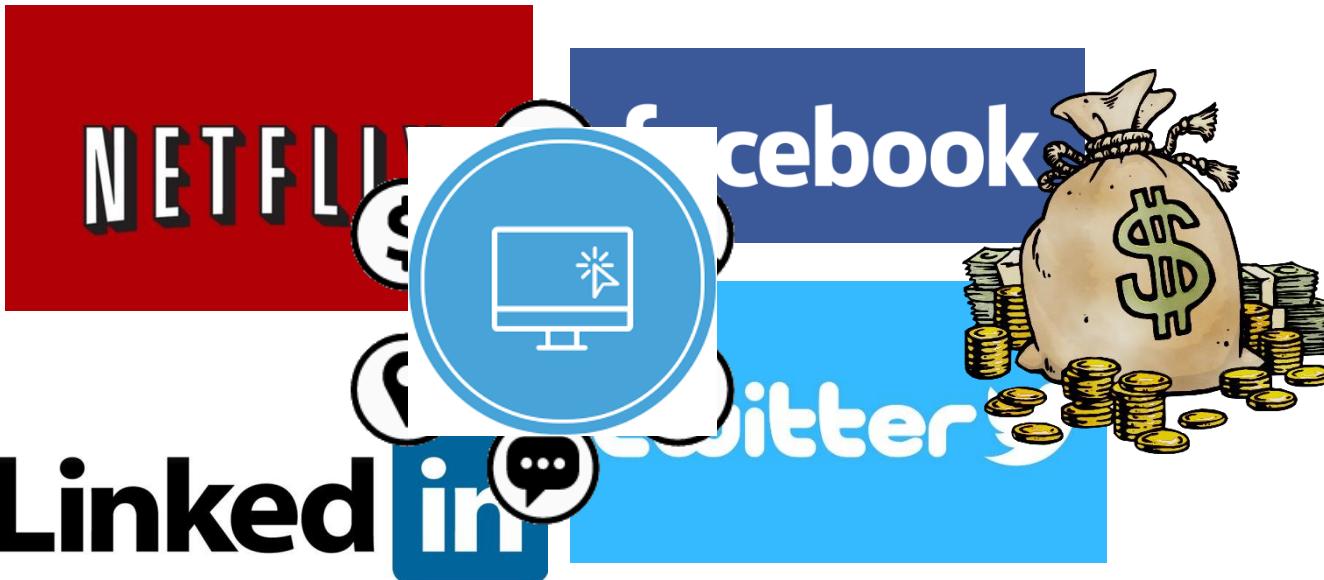
Usage of cloud

- Direct: As an end user, I register/pay/subscribe to a cloud provider to use their services.



Usage of cloud

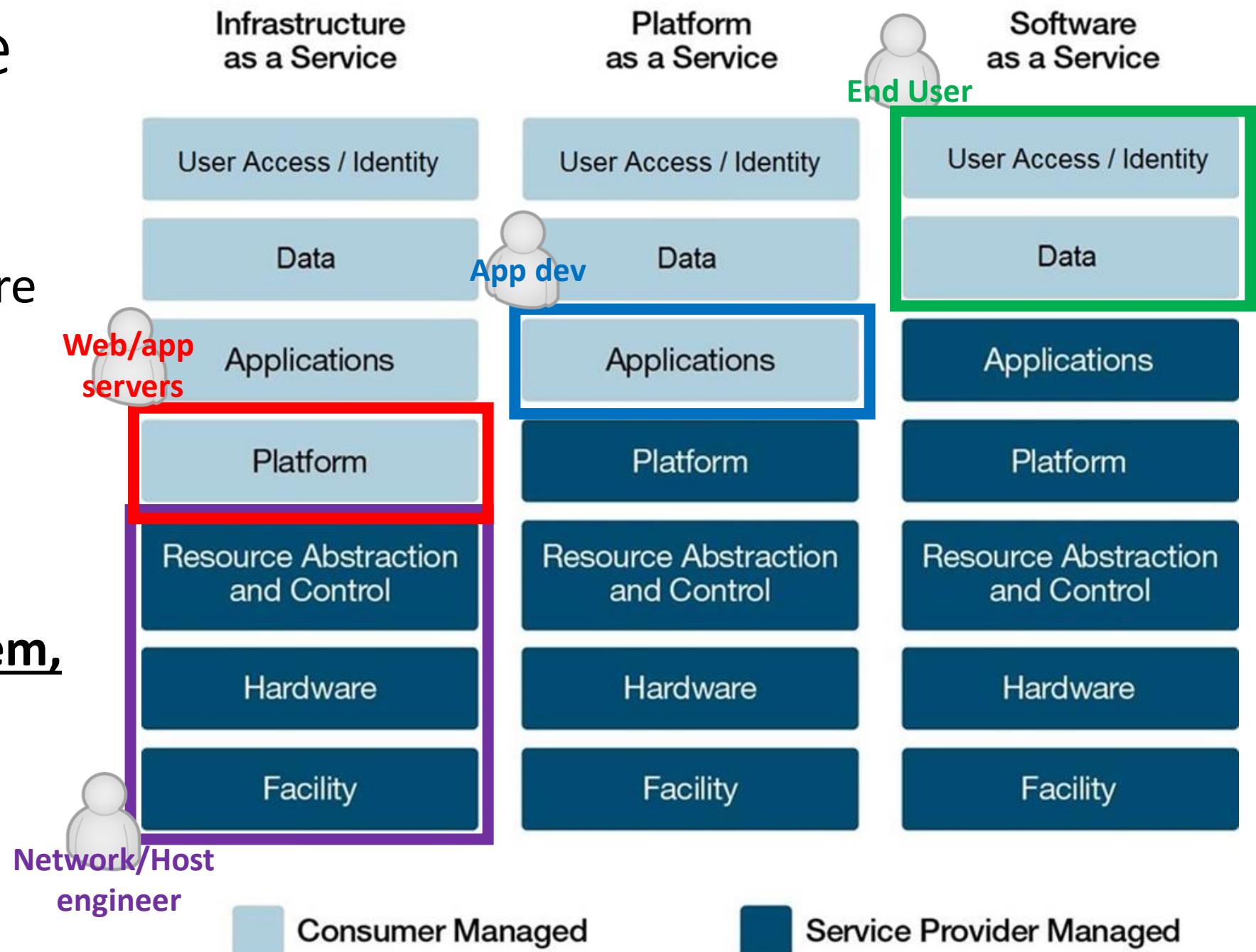
- Indirect: As an end user, I register/pay/subscribe to a company for service but their service offering is a composite of other cloud technologies.



? as a Service

- On-prem
- IaaS – Infrastructure
- PaaS - Platform
- SaaS - Software

***Note that these layers can be on-prem, public, or hybrid.



Infra (aaS)

- Traditional datacenter
- Bare metal hardware or VM
- Manage your own network/data storage



Google
Compute
Engine

Platform (aaS)

- We don't need to manage an OS or middleware, but we still need to manage our application deployment and data.
- As application devs, we want to be here!



Software (aaS)

- Software is running already, just need to configure and use. Lowest barrier to entry, lowest maintenance, however least customization.



STEAM®



XBOX LIVE



PLAYSTATION®
Network



PayPal



Bank

SAP SuccessFactors



Google™ Apps



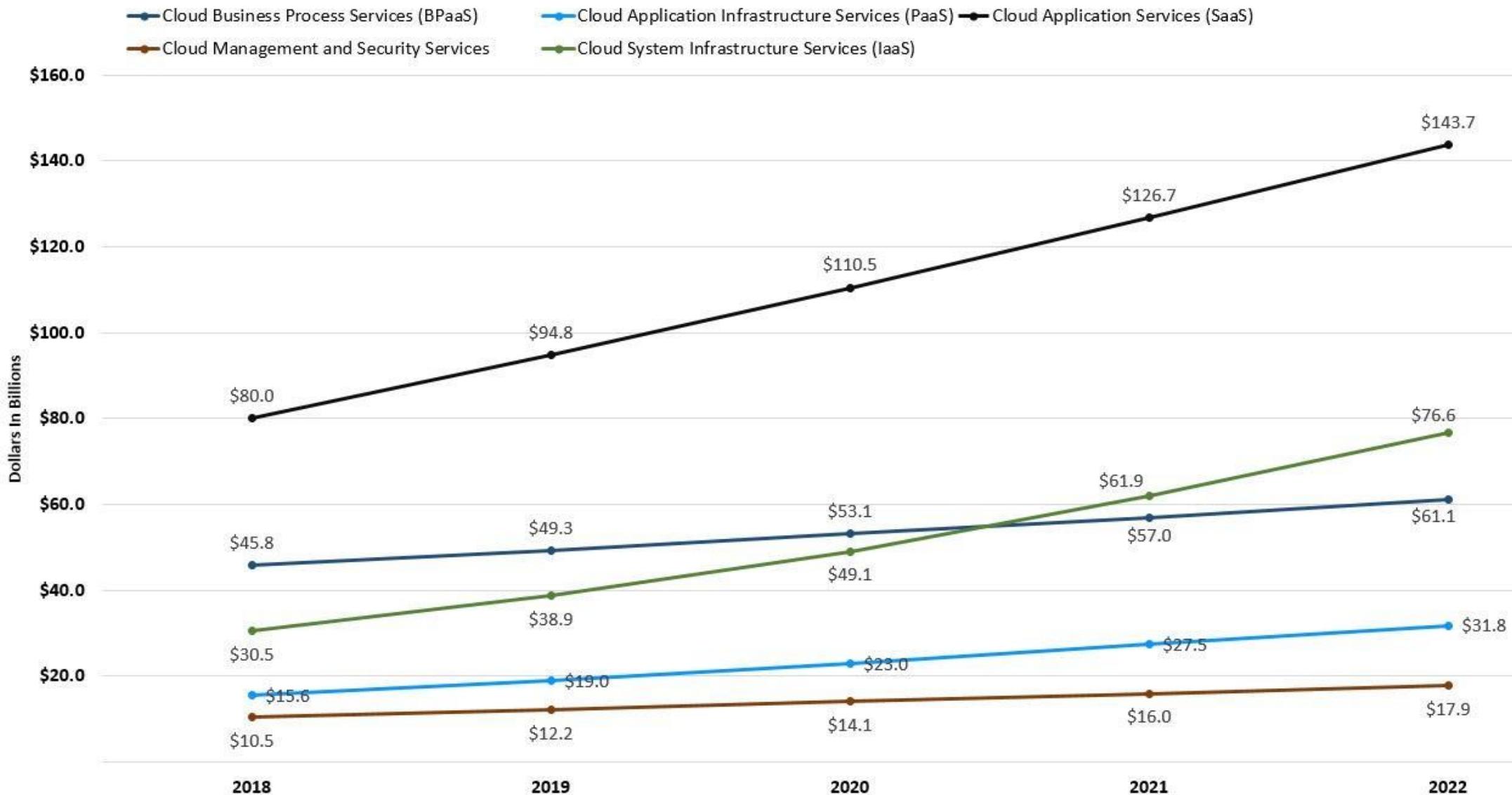
Question???

- Can you think of any functional, or non-functional, requirements that your client could ask about that would have you think of cloud?

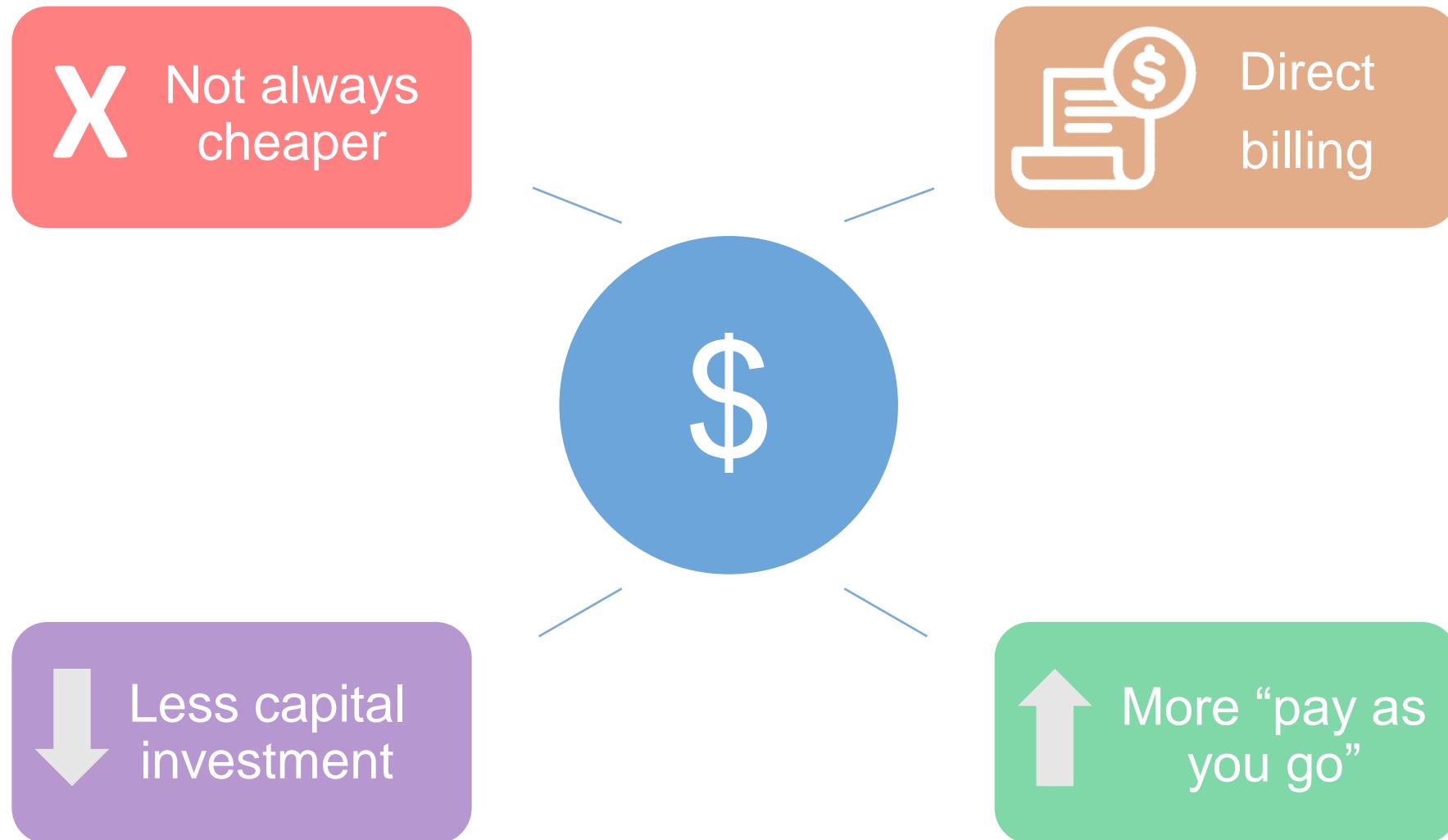


Worldwide Public Cloud Service Revenue Forecast, 2018 - 2022

(Billions of U.S. Dollars) Source: Gartner April 2, 2019



Cost considerations of shifting to cloud



Cloud Roadblocks

- Need to have a **journey statement with what you are trying to achieve**. Have some well defined goals that can be measured as management will ask for it to gauge success. (Charter-light, vision)
- **Debunk the myths**, run the calculators for total cost of ops/migration, change management with clients, technical culture shift, management persuasion, etc.
- Look at the **competing benefits/risks**. It may not be necessary or feasible to run in the cloud.
- Inject the question into your **APM process** so that each time an application renewal comes up you ask yourself.

Roadblocks to Getting Started

1. Skillset – we need more people that are well versed in cloud strategy, developers in cloud using native services or app deployment, or know how to setup a containerized on-prem cloud.
 - We are finding pockets of people or partners with this skill and including them in our plans.
2. Security “blessing” – security needs to be versed in cloud and have their concerns around services and data in the cloud addressed
 - Security teams are very knowledgeable and working with us now to ensure we have a safe place to work.

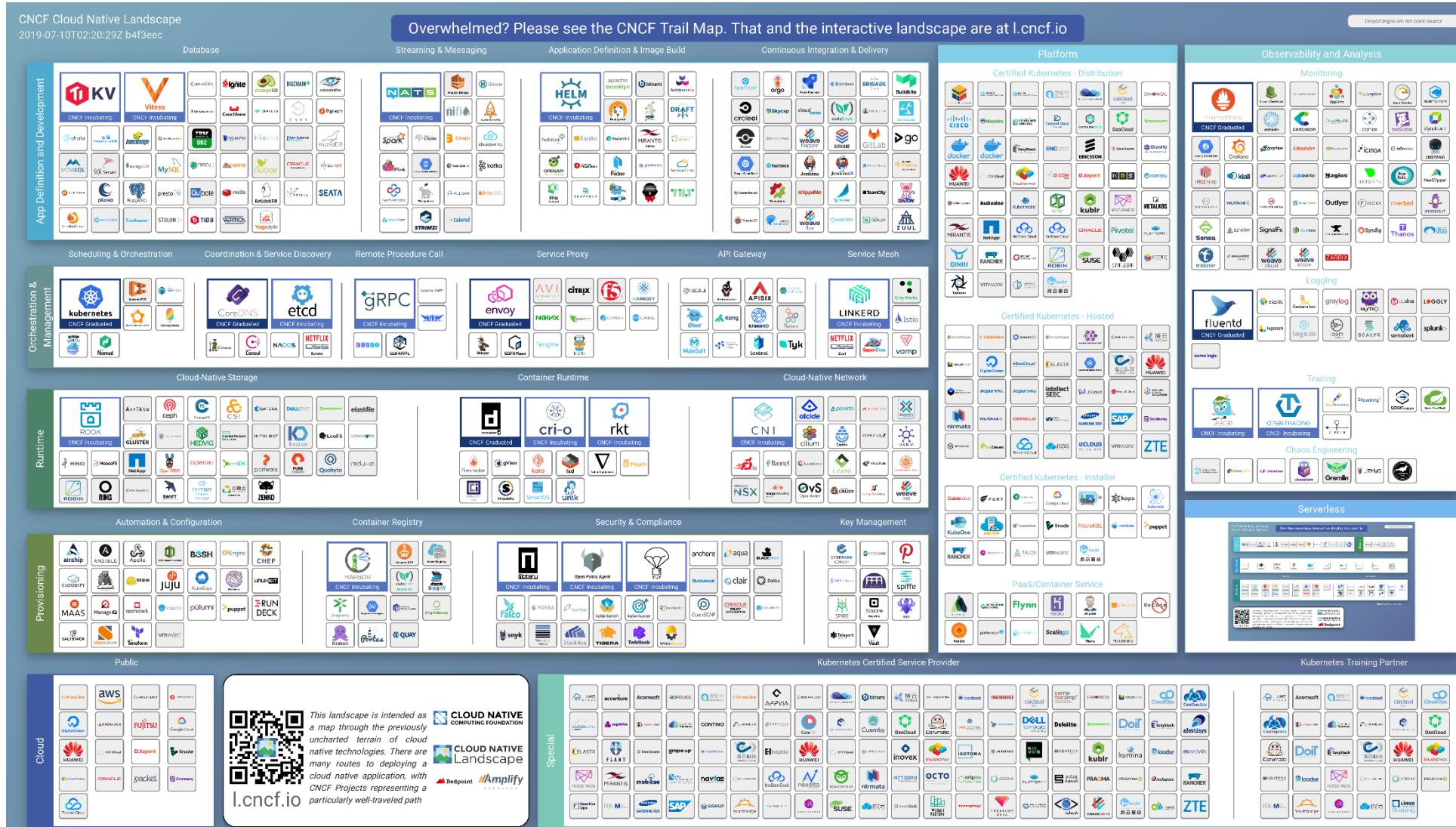
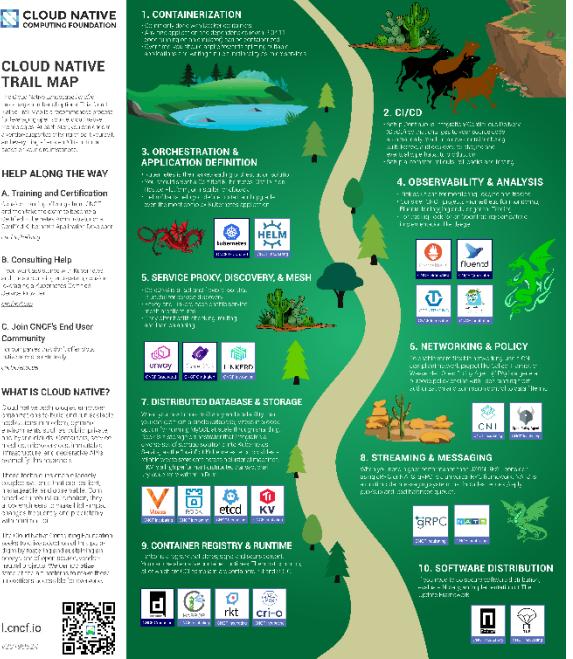
Roadblocks to Getting Started

3. Management buy-in – need to convince management to allow time, funds, and resources to work in the cloud space. How do you do this when understaffed and underfunded.
 - Presenting the business case for more SaaS can be an easy sell if you show your TCO running a similar service to what we would be charged using cloud.
 - Create an internal resource pool for containers using an orchestrator. This shows theoretical efficiencies in hardware usage in our datacenters with an evolution path of moving the containerized apps to public cloud.
 - A DevOps/CICD strategy to show speed of delivery gains for our development teams using containers/cloud and automated tooling to show that for little investment we could increase our efficiency to get more services delivered with less.

Roadblocks to Getting Started

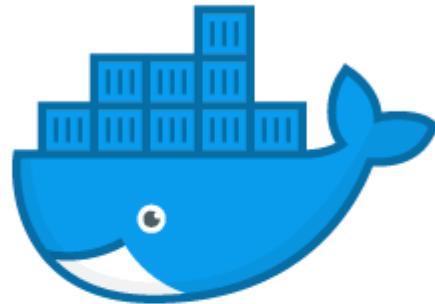
4. Tech selection -- <https://landscape.cncf.io>, Azure, AWS, GCP, 3rd party??

https://raw.githubusercontent.com/cncf/trailmap/master/CNCF_TrailMap_latest.pdf



Advent of new technologies

- Virtual Machines are still in use, but containerization of applications is quickly becoming the norm due to the cloud-native abilities.
- Docker, Kubernetes

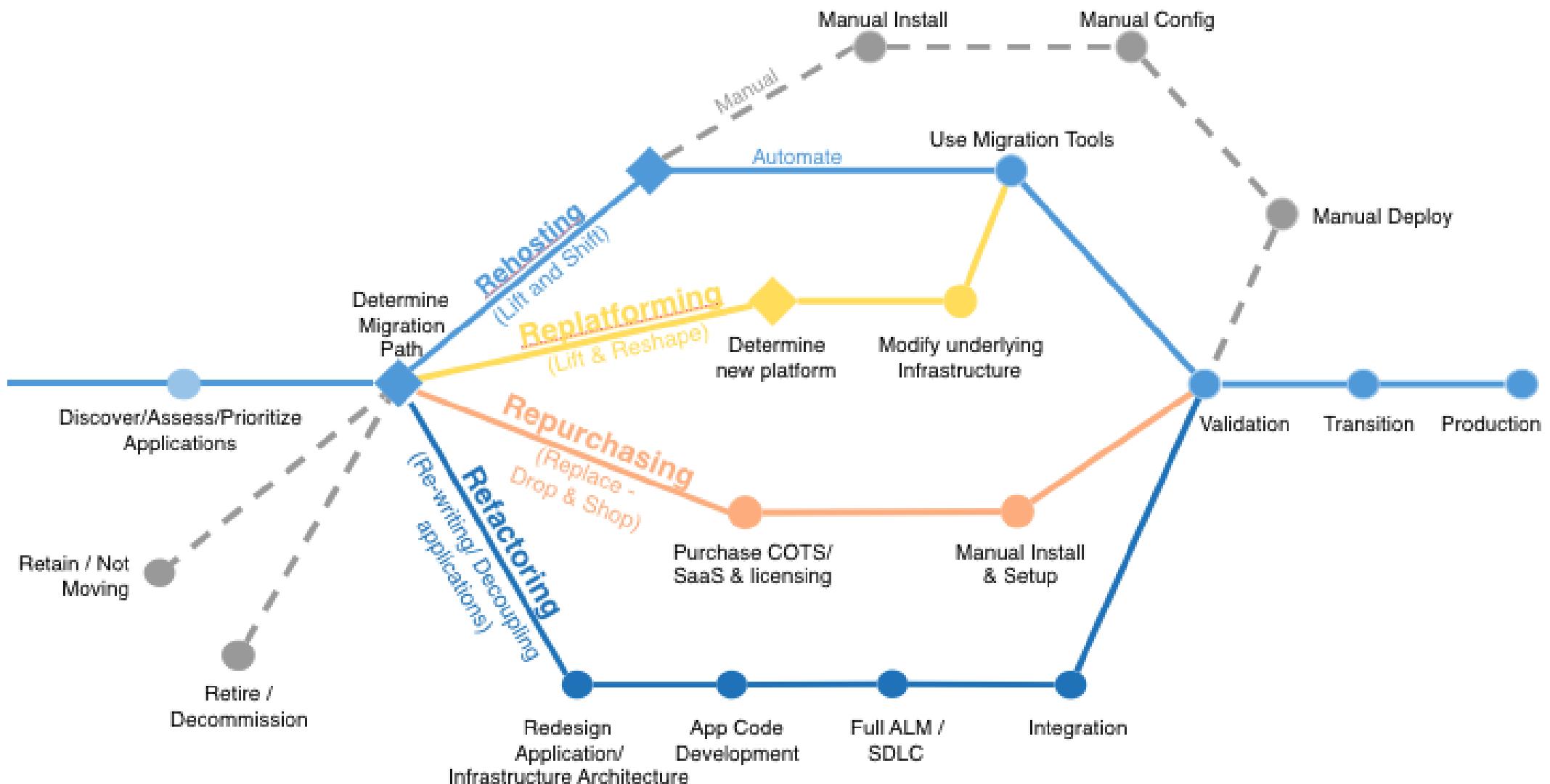


docker



kubernetes

Migrating legacy apps to the cloud (The 6 Rs)



Common Application Migration Issues

- Integration to data center
 - If an app can live in the cloud completely, data and all, then put it all out there or have it in your evolution plan to move to full data hosting. Egress charges are not fun unless you spring for an ExpressRoute or another dedicated pipe which is also not cheap.
 - API Management Gateway as an edge could help with this to terminate the traffic before it comes in through your network. Provides an extra level of auth if it is needed
- Data sovereignty (transit / rest)
 - Is there an issue with your data piping down to the US/New York in transit? Is there a problem with your data residing in US, Europe, or even North Korea/Russia/China? Maybe there is no issue as the data is not PB/Classified.
 - If it is then you need to look at Canadian regions for CSPs or host it yourself.
 - All depends on your data classification

Common Application Migration Issues

- Vendor lock-in
 - Avoid at all costs, even it is cheaper initially.
 - Stay as vendor neutral as possible and stick to standards.
 - SaaS makes this a very real challenge.
- Elasticity
 - If your applications are not designed to be scalable then the only benefit of a lift-and-shift to a CSP IaaS is to avoid data center costs. The application will get no benefit and neither will your client.
 - Some applications may need to be redesigned to take full advantage of container self-healing or a HA/clustered configuration.
- Cost model
 - Moving to cloud is essentially moving to an OpEx model. If you have licensed COTS already then you may already be there but showing a CapEx TCO on a 5 year lifecycle is very different from an OpEx SaaS. Hard to compare and justify to management but it does make the case much stronger.
 - The big CSPs can have a subscription with a cost center tied directly to your end client so they can pay for everything. Is this a model they would like?

Who uses cloud?



Questions?

