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A Recipe to Build a Successful Cloud Environment - Stop Thinking Legacy, Think Cloud!

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About Us

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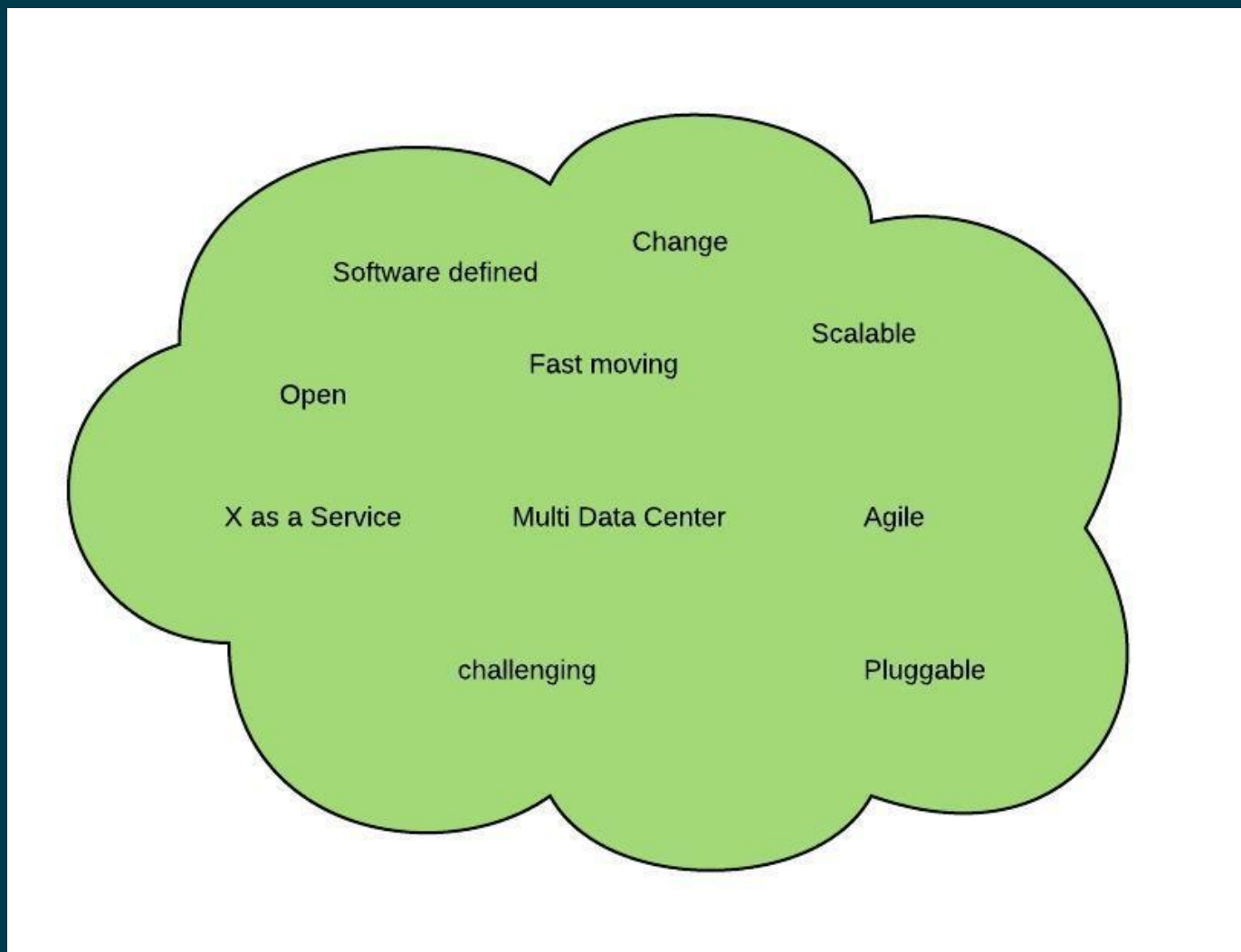(OpenStack,OpenShift,CloudForms,
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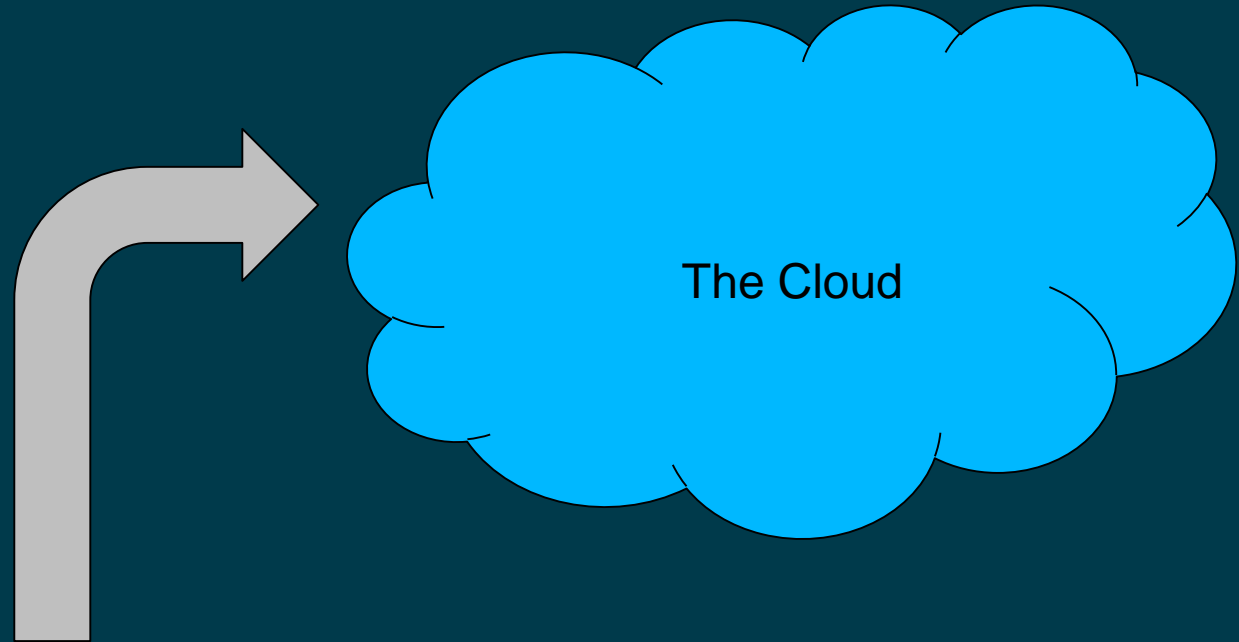redhat.

1. What is your company's definition of the Cloud

Cloud Buzz

What do you think of if you hear cloud?

The Cloud Solution?

The Cloud in Solutions?

The Cloud

Public Cloud Providers	AWS		GCE	Azure		Legacy world
Software as a Service	Self Service		Single pane of glass			
Platform as a Service	Containers	DevOps		Mobile		
Infrastructure as a Service	Compute	Storage		Networking	NFV	

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Cloud definition NIST

NIST Special Publication 800-145:

"cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

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Cloud definition NIST

NIST Special Publication 800-145:

The NIST definition lists five essential characteristics of cloud computing:
➢ on-demand self-service
➢ broad network access
➢ resource pooling
➢ rapid elasticity or expansion
➢ measured service

As well as three services models:
➢ Software
➢ Platform
➢ Infrastructure

And four deployment models:
➢ Private
➢ community
➢ Public
➢ Hybrid

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2. Understanding the Pains, Business / Technical Goals and Objectives

Define The Pains

➢ Too many barriers to adopt new application
➢ Provisioning for infrastructure is to long
➢ New technology is made available to application developers with to much of a delay
➢ Time to release from dev to prod for applications takes too long
➢ Software distribution process for complex applications is non deterministic
➢ Current chargeback and billing does not incentivize economic use of resources
➢ Resource utilization of dev/qa/test and production systems are not optimal
➢ Engineering effort and time to market for new platforms is too high and constantly rising
➢ No capability to dynamically increase capacity when demand for computing capacity spikes
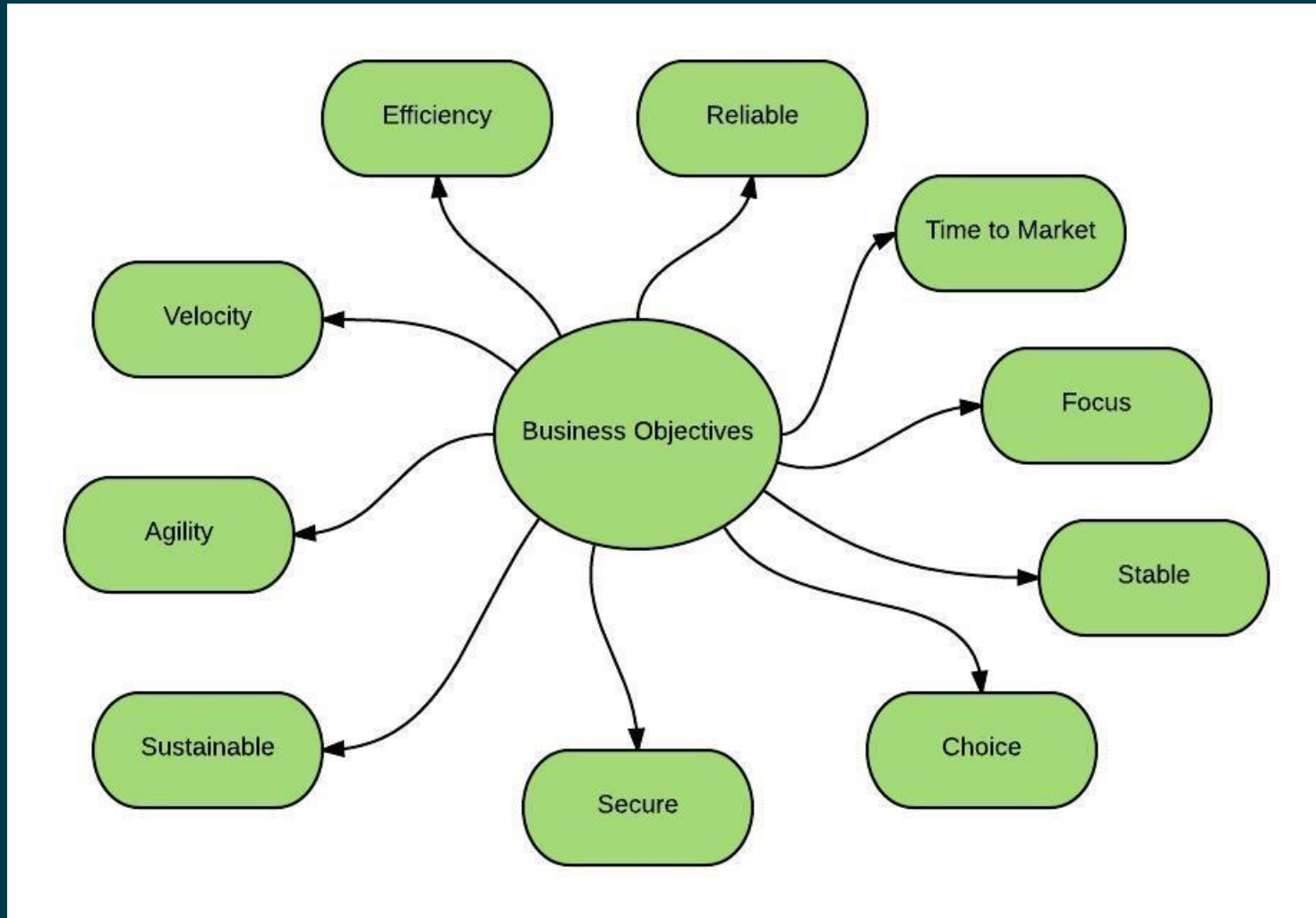
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Business Objectives

Business Objectives

How can the cloud help me to solve the following business objectives:

➢ I want to increase Efficiency – Cost improvements of operations and development

➢ I want to increase Velocity – Adapt quickly to business change new functions and capabilities

➢ I want to increase Agility between development and operation teams – Introduce DevOps workflows

➢ I want to decrease Time of deployment – Automation and Just in Time delivery / Self Service

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Business Objectives

How can the cloud help me to solve the following business objectives:

➢ I want that my resources Focus on the core business – Enable human resources with training and mentoring
➢ I want the Choice of platform for my consumers – Keep an open mind for different technologies
➢ I want to build a Reliable solution – High available infrastructure
➢ I want to build a Secure environment – Govern the environment
➢ I want to build a Stable environment – Maintain the environment
➢ I want to make sure my investments are Sustainable and future proof – Choose vendors which use open source software for your cloud

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Technical Objectives

What are your business objectives and requirements

➢ Managing the transition and integration of a service spectrum spread across internal and external resources
➢ Bridging the gap between traditional and new cloud infrastructure
➢ Bringing staff up to speed on new technologies
➢ Shifting the mindset from traditional infrastructure focused thinking to cloud thinking
➢ Keep up the lights on in the traditional environment and build a new agile cloud environment
➢ Remove silos between dev and ops teams
➢ Shifting the mindset around building applications / api first mentality
➢ How can we get ready for change

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3. Background /
Current State of Architecture

Background

Background

Create a reflection of your day to day routines:
➢ What works in the current environment
➢ What can be improved in the current environment
➢ What are the workflows in the current environment

Create views of the different workflows you have to go through:
➢ What workflows work and which one of them could be improved

Create a picture of all the applications you are interacting with and how they communicate together:
➢ For example Web and Database applications
➢ Database replications
➢ Applications which are distributed from a geographical perspective

Create a list off all your application which need persistent storage:

Current State Of Architecture

Current State of the Architecture

Meet with all the stakeholders of your new cloud environment (business and tech)

➢ Create drawings/whiteboards of your current environment and how it maps to the different business projects.
➢ Make sure you capture all your legacy infrastructure correctly
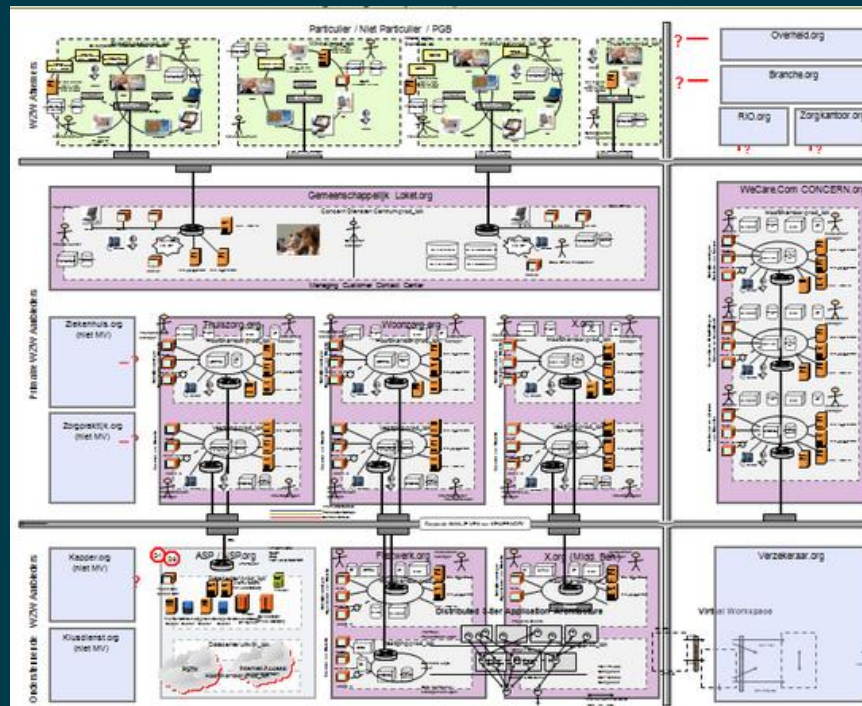
4. Use Cases

Use Cases

What Use Cases do you have for the Cloud

Bases on your background and current state of architecture pick 5 main use cases which you would like to solve with a "cloud environment"

➢ Create a self service portal for customers
➢ Keep the overview in a cloud environment through a single pane of glass
➢ Improve the workflow of infrastructure and application delivery
➢ Being able to scale out rapidly of needed
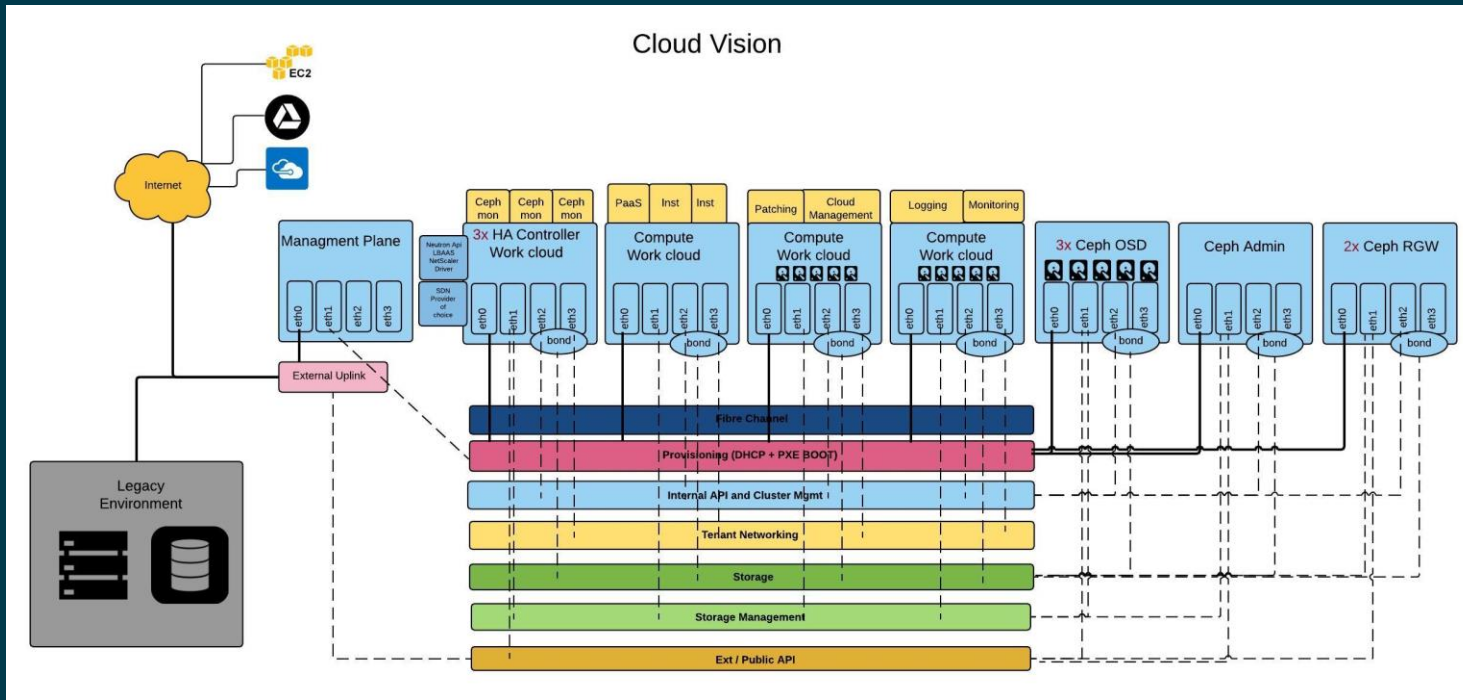➢ Being able to work through a bigger set of data

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5. The Vision

The Vision

The Cloud Vision (technical)

We now know the pains, business / technical goals and objectives, we have an idea of the background and the current state of architecture as well as the use cases we are trying to solve. Based on that we can create the vision of cloud.

What do you need to get there

What do you need to get to the cloud?

1. Find skilled Cloud Architects which can help your it staff through a cloud build out. Cloud Architects need to know the following
   ➢ Understand the overall architecture (Networking, Storage, Compute, Applications)
   ➢ Focus on Self Service
   ➢ Enable Process and Methodology in Code
   ➢ Api first mind-set
   ➢ Share your knowledge mind-set

2. Form a core team which will be working on your cloud project 100%
   ➢ No 80% is not enough
   ➢ Make sure you give your cloud team enough time to focus on designing building and running the cloud

3. Train your IT Staff and Business users towards a cloud mindset

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What do you need to get there

What do you need to get to the cloud?

4. Engage with the right partners. Building a cloud is not easy.
- No proprietary code
- Look for a partner with a large partner ecosystem
- Look for a partner which has experience across the whole stack. Understanding OpenStack is not enough!
- Look for a partner with certified and tested hardware (Storage, Networking, Compute)
- Look for a partner which has proven cloud consulting services

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6. From Proof of Concept to Production

From Proof of Concept to Production

Why do I need a proof of concept?

➢ Building a cloud is a iterative process. You will realize that you will build, extend, destroy and rebuild it again and again until you are happy with the refinements of each deployment.

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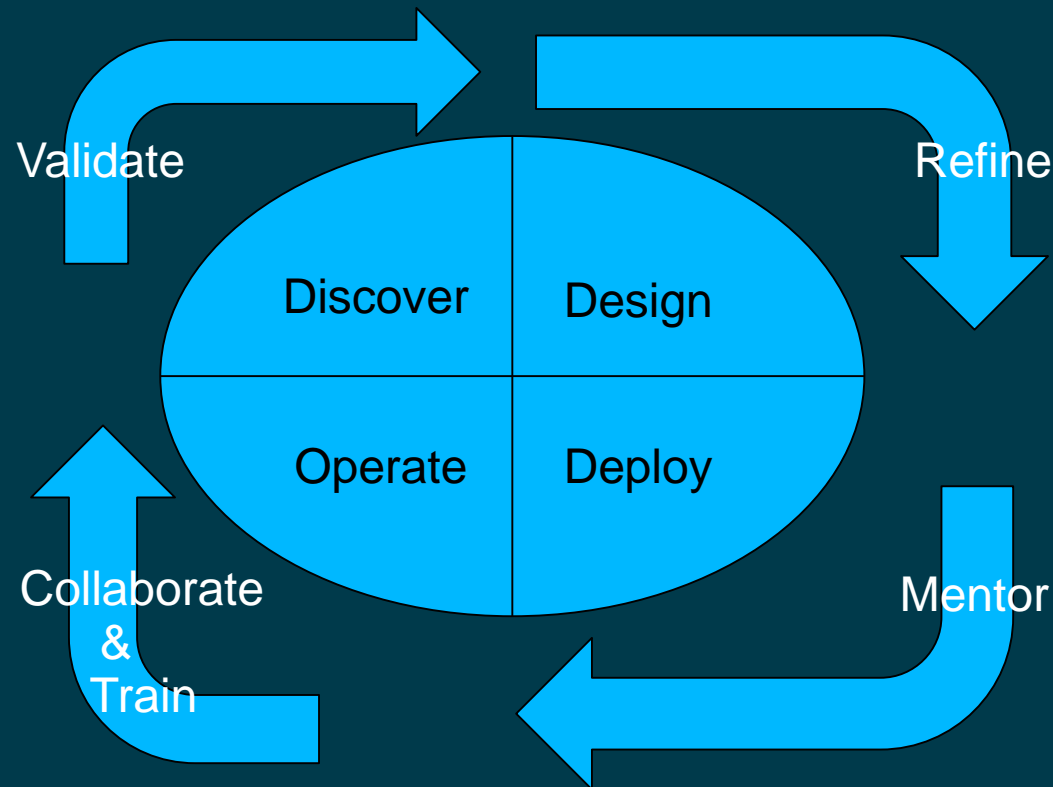
From Proof of Concept to Production

Why do I need a proof of concept?

➢ Start small and keep it over viewable. In the first phase keep it simple.
➢ Define Compute requirements
  ➢ Bonding for resiliency
  ➢ Host aggregation for different hardware type
  ➢ SRIOV for PCI passthrough

➢ Define Storage requirements
  ➢ Ceph
  ➢ Multiple disk backbends
  ➢ Storage replication

➢ Define Networking requirements
  ➢ Tenant isolation (Vxlan or Vlan)
  ➢ Provider network to bridge legacy
  ➢ Floating IP for public access

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From Proof of Concept to Production

Operational Tools

➢ Build Logging and monitoring for your cloud environment
  ➢ Monitor API endpoints as well as traditional system and cluster checks
➢ Build a single pane of glass for your cloud environment
  ➢ Use a tool which gives you the entire overview of the environment
➢ Train your staff / hands on in the POC environment. Let them get comfortable with what you have before you proceed to the next iteration.
➢ Knowledge sharing across the team is very important in this step!

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From Proof of Concept to Production

Once the OpenStack admins feel comfortable with the environment start introducing the following:

➢ Software Defined Networking
➢ If you want to add different storage tiers (multi backend)
➢ OpenStack as a Service Modules like Sahara, LBaaS, Trove
➢ Test Ironic in the overcloud
➢ Test Containers in the overcloud
➢ Look into backup and DR
➢ Mimic multisite installations

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From Proof of Concept to Production

After a few iterations you will get a good feeling and idea how your production environment should look like

➢ Make sure that you keep the POC / Testing environment around (you will need it later
➢ Determine what your update/upgrade cycles are for the cloud environment
➢ Determine what your processes are going to be on how to introduce new functionality
➢ Determine how your are planning to migrate applications from traditional infrastructure to your new cloud environment
➢ Determine the amount off staff needed to run the cloud environment
➢ Remember cloud products are emerging products – You will break it

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Questions