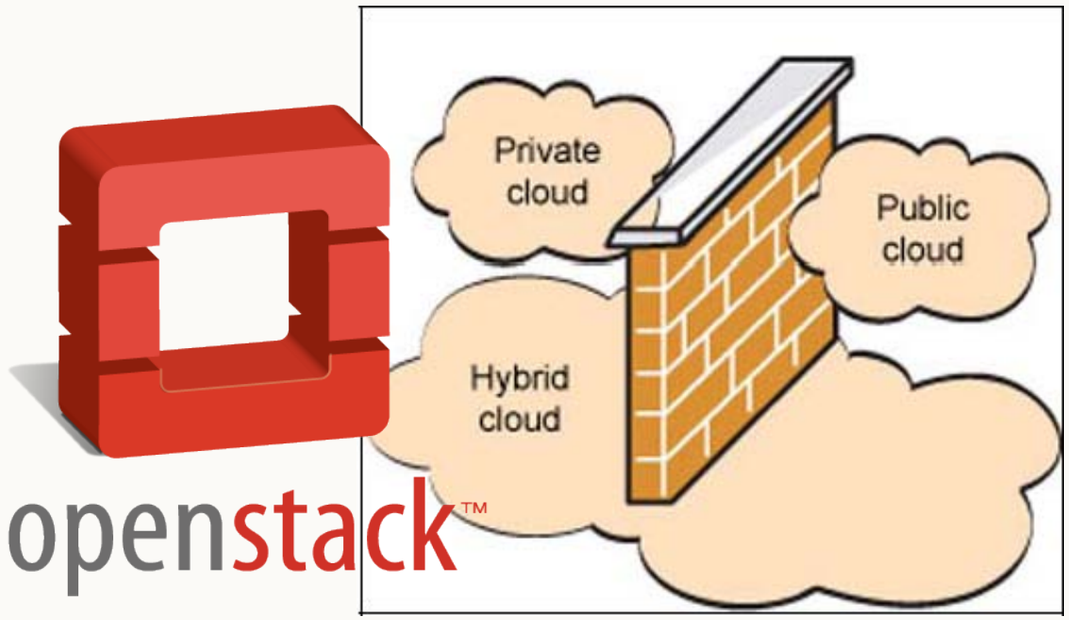
A HYBRID CLOUD FRAMEWORK WITH OPENSTACK



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Introduction

- OpenStack: OpenStack is an Infrastructure as a Service (IaaS) cloud computing project that is free open source software released under the terms of the Apache License.

- Public Cloud: Public cloud applications, storage, and other resources are made available to the general public by a service provider

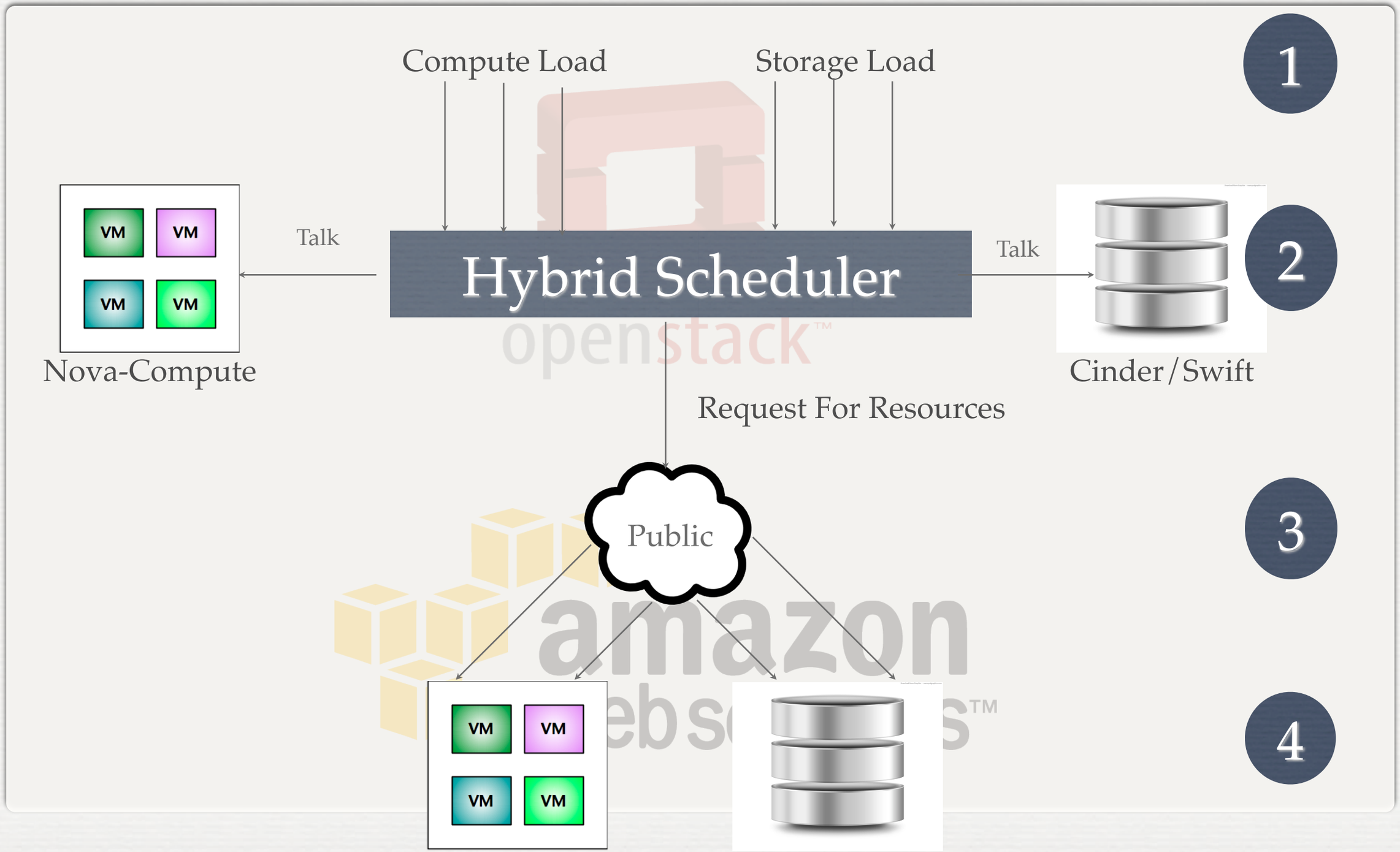
- Private cloud: Private cloud is cloud infrastructure operated solely for a single organization, whether managed internally or by a third-party and hosted internally or externally.

- Hybrid Cloud: Hybrid cloud is a composition of two or more clouds that remain unique entities but are bound together, offering the benefits of multiple deployment models.

Objectives

- Develop Hybrid Scheduling Algorithms. To tackle issues such as
  - Scalability - Eg:- Spike in workload.
  - Availability - Eg:- Server Failure, Disaster Recovery.
- Design Efficient Hybrid-Cloud Configurations focusing on Openstack.

Architecture



Legend for Architecture

1 – Different types of load come in Contact with the Hybrid scheduler requesting for resources. Typically, they may be Compute or Storage Resources.

2 – The Hybrid scheduler intelligently segregates the Load by,

- Vertical split : DB in private cloud and App server in Public cloud.

- Horizontal split: Split web servers across public and private clouds.

3 – Once they are assigned to different cloud-providers, then requests are sent to the filters to allocate the type/flavor of resources that are feasible.

4 – At this Filter Layer, We can use any known filter on the basis of load & requirements. With the list of nodes that pass the filters, we can move on to the final step.

5 – We deploy load onto granted resources.

Hybrid Scheduling Policies

- Scheduling policy works in a 2 step procedure.
- Estimate: The cost's incurred in moving Compute to data and vice versa is estimated and a appropriate choice is made.
- Scheduling: scheduling policies like.
- Burst , Migrate and burst, Least loaded resource which are explained in detail.

Definitions of scheduling policies

- Burst: when a spike load arrives, a Burst is made to create resources on public cloud and satisfy the requirement.
- Migrate and Burst: A Burst is made on the Public cloud and a functionality is migrated to the public cloud, leaving related components on the private cloud.

Challenges

- Degree of Coupling : The amount of support provided by the public cloud service provider to build a hybrid configuration is a major factor.
- Networking Challenges: There should be one view of the resources allocated from a client perspective, therefore Networking and Bandwidth constraints crop up.
- Multiple cloud vendors provide multiple flavor of resources , compatibility constraints have to be in focus too.

Thank you