Migration as a service

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Why Migration as a service

- Our project seeks to deliver migration as a service in a multi-cloud environment offering instance and subnet migrations across various clouds. We are aware of the requirement for migration services in any cloud-based solutions and are familiar with the migration services offered by various cloud suppliers. Instance migration involves moving user-specified VMs inside the same subnet from one cloud to another. Subnet migration entails relocating a user-specified subnet along with all of the VMs included inside it from one cloud to another.

CRUD Operations

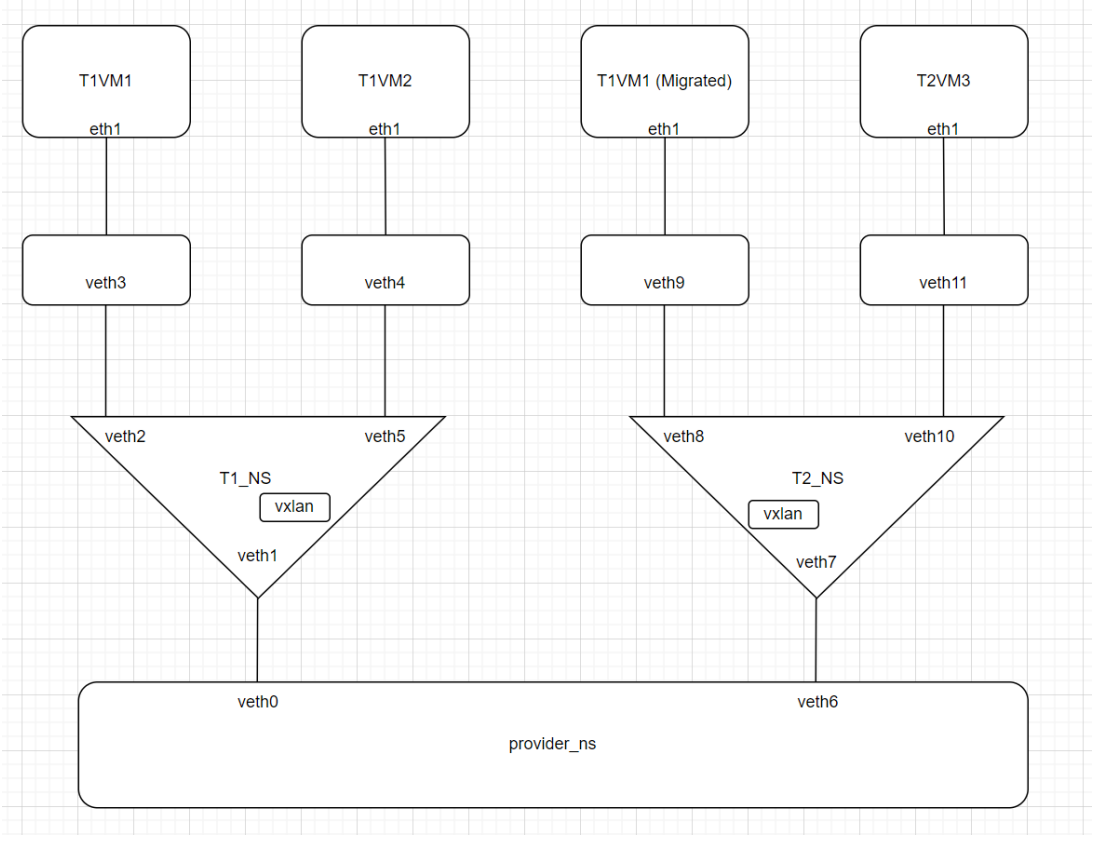
1. Create, update and delete tenant
2. Create, update and delete DNS/DHCP
3. Create, update and delete network

User Inputs (Northbound)

- User has to provide the following details to bring up their desired infrastructure:
  - Tenant name
  - Network: cloud, subnet address
  - VM Instance: name, disk-size (GB), memory (GB), number of vCPUs
  - DNS/DHCP Server: tenant subnet address

The user enters these tenant details through file edit operation similar to libvirt. The user provides a YAML file with all the requirements. This structure forms the Northbound component of the system.

Functional Implementation (Southbound)



Execution

- Run the following command after updating the input yaml file:
  - **sudo python3 create_infra.py**
- To migrate the VMs (not yet created) run the following command after entering details in yaml.
  - **sudo python3 perform_migration.py**

Infrastructure Creation

- Following steps were implemented for creating the user specified infrastructure:
  1. Parse the yaml files to fetch the input variables
  2. Create Tenant Namespace
  3. Create Subnet Namespace
  4. Create and Attach Tenant VETH pairs
  5. Add IP addresses to Tenant VETH Pairs
  6. Create and Attach Namespace VETH Pairs and bring them UP
  7. Set Namespace VETH Pairs UP
  8. Add IP addresses to Namespace VETH Pairs
  9. Add IP Route to Tenant and Tenant subnets
  10. Create bridge inside namespace
  11. Create and Attach DNS VETH Pair
  12. Bring all the bridges UP and add IP to DNS interface
  13. Create DHCP server
  14. Provide Tenant Isolation by creating VXLAN
  15. Add Vxlan routes

VM Creation

- Following steps were implemented for creating the user specified VMs:
  1. Create VM template
  2. Copy VM image
  3. Define and Create VM
  4. Start VMs and attach VMs interfaces

Migration

- Following steps were implemented for creating the user specified VMs:
  1. Check if the infrastructure is ready for migration (subnet check)
  2. Parse the input yaml file for Valid Migration Activity
  3. Create Migration infrastructure and add routes
  4. Copy VMs using scp

PS: Not Implemented completely

Thank You