

# User-level Tutorial on Using OpenNebula

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# Outline

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**1 – Introduction**

**2 – OpenNebula Architecture**

**3 – Hands on: Private Cloud**

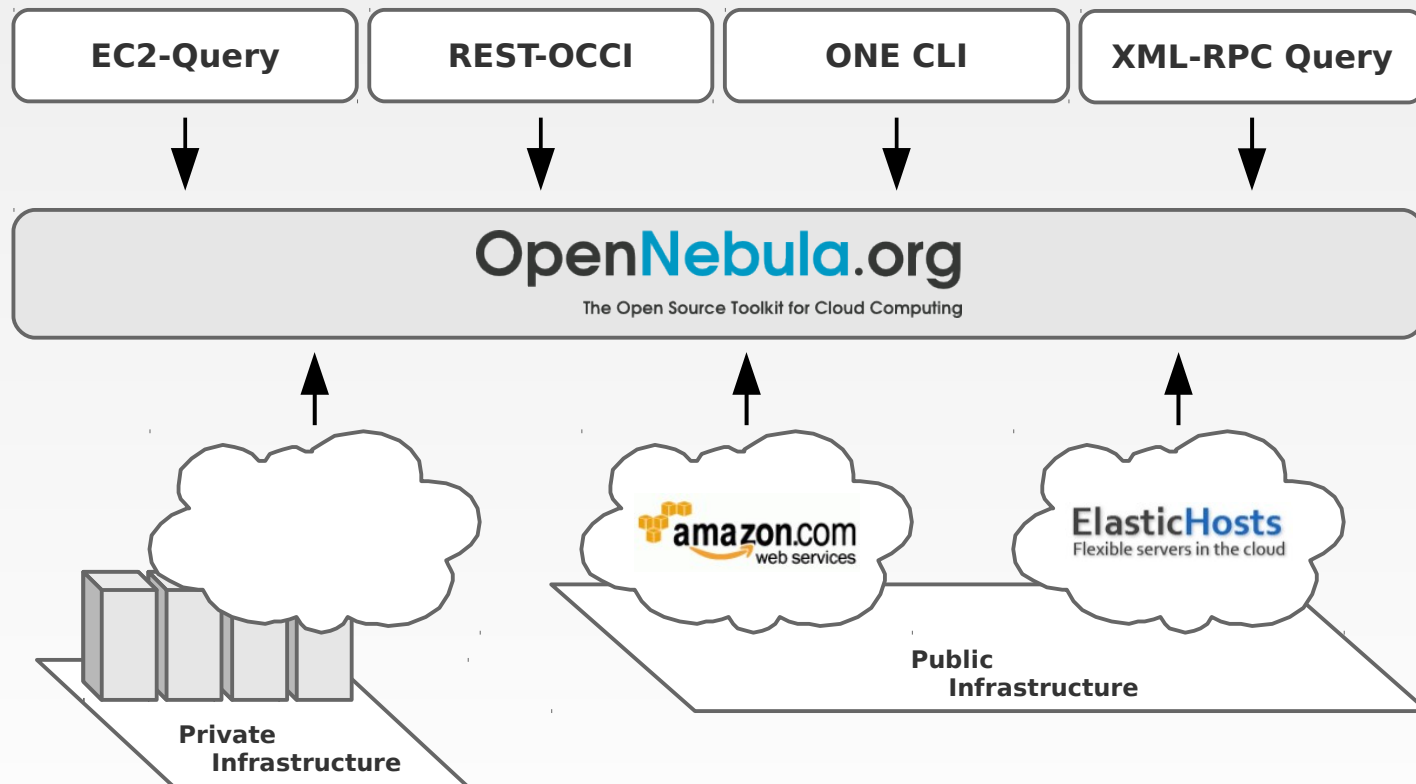
**4 – Final Considerations**

# 1 - Introduction

- **OpenNebula (ONE)** is an open-source cloud computing toolkit.
- This Virtual Infrastructure Manager orchestrates **network**, **storage** and **machine** virtualization.

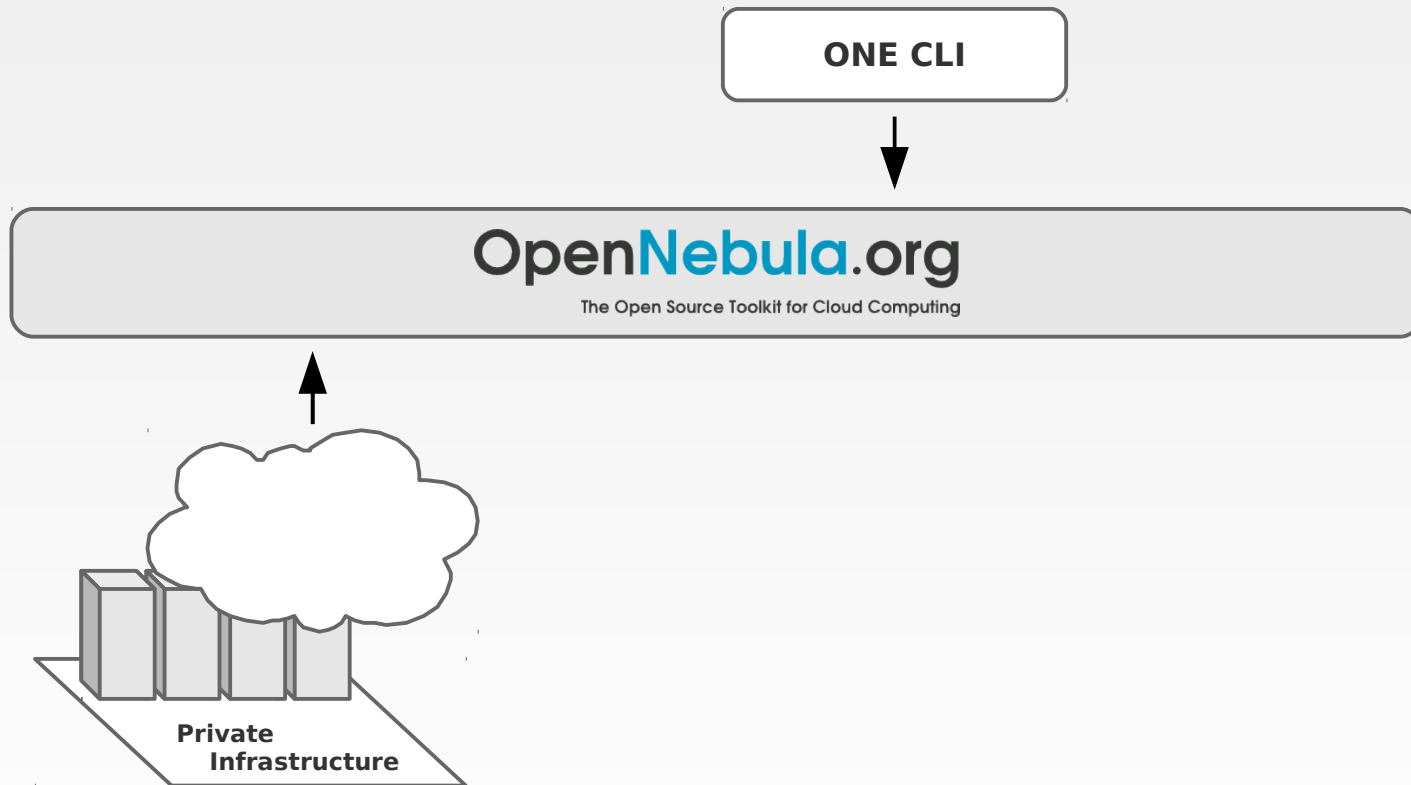
# 1 - Introduction

- **Private Cloud:** Private Infrastructure and Usage
- **Public Cloud:** Public Infrastructure and Usage
- **Hybrid Cloud:** Public/Private Infrastructure and Public Usage

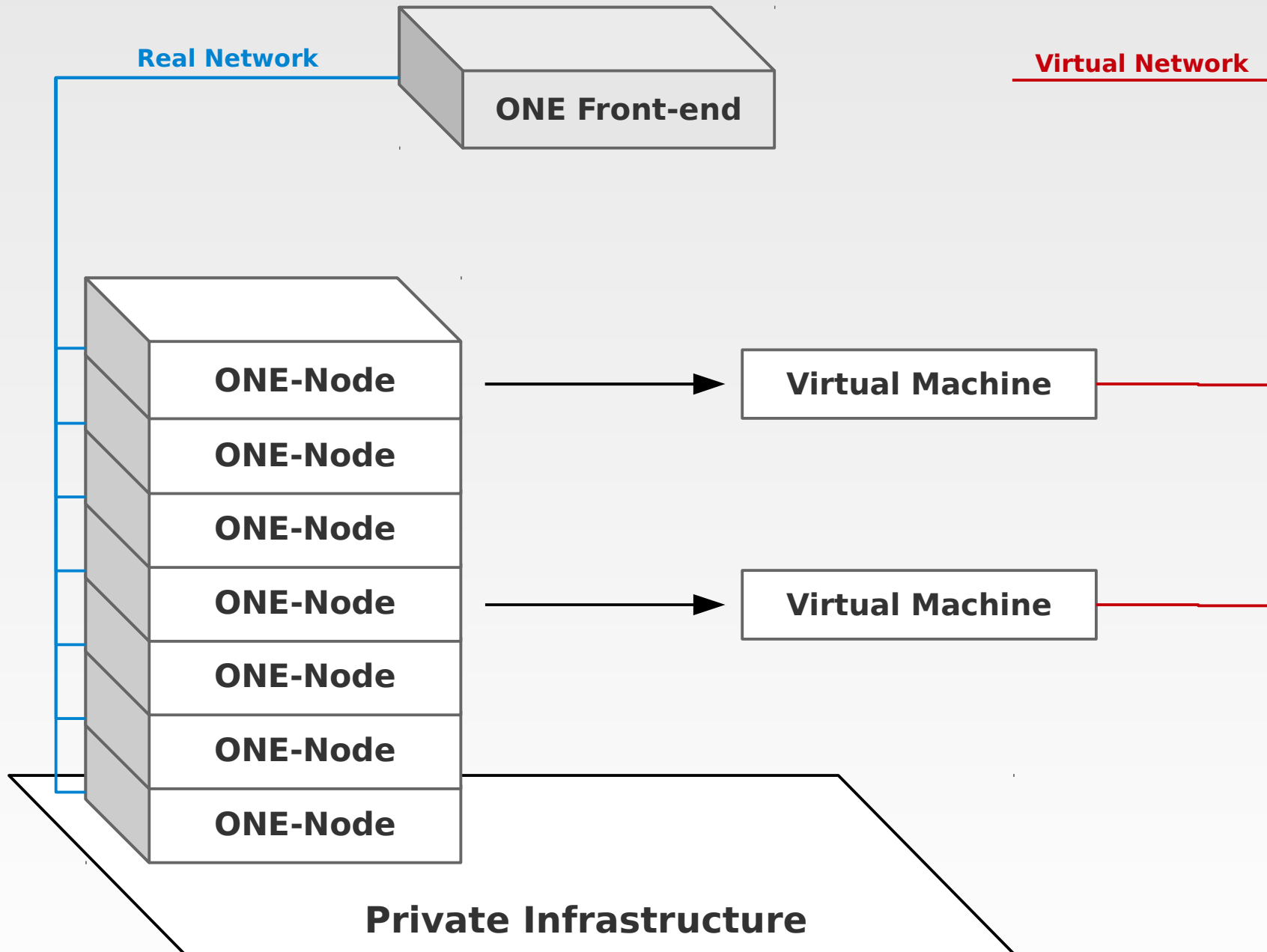


# 1 - Introduction

→ Tutorial cloud case: Private cloud



# 2 - ONE Architecture (Components)



## 2 - ONE Architecture (Virtual Network)

→ **Virtual Network (VN) in ONE is a MAC/IP addresses space to be used by VMs, through leasing.**

→ VNs are controled through the **onevnet** tool.

→ **VN Template example:**

NAME = "Public"

TYPE = FIXED

BRIDGE = vbr1

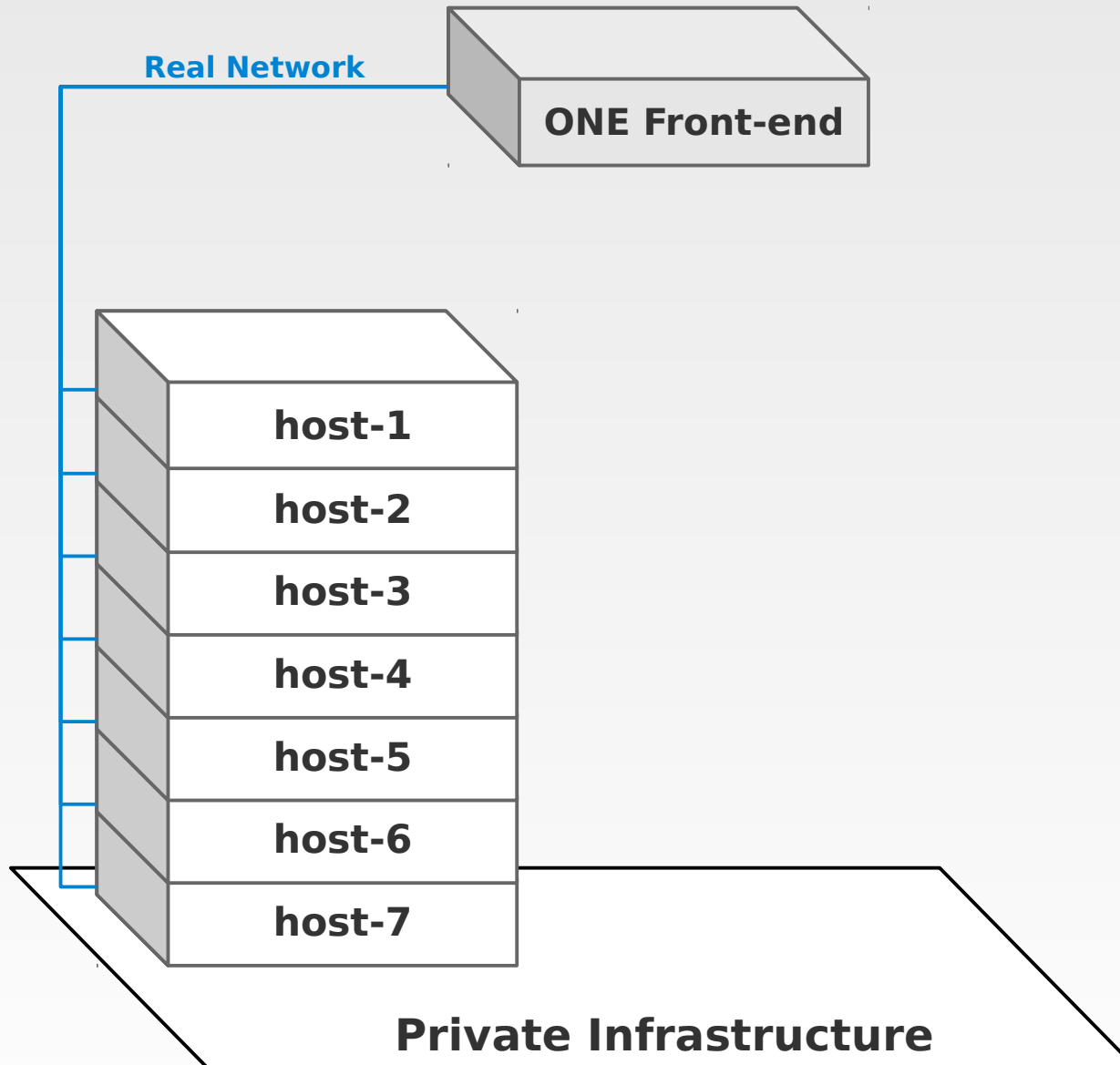
LEASES = [IP=130.10.0.1, MAC=50:20:20:20:20:20]

LEASES = [IP=130.10.0.2, MAC=50:20:20:20:20:21]

LEASES = [IP=130.10.0.3, MAC=50:20:20:20:20:22]

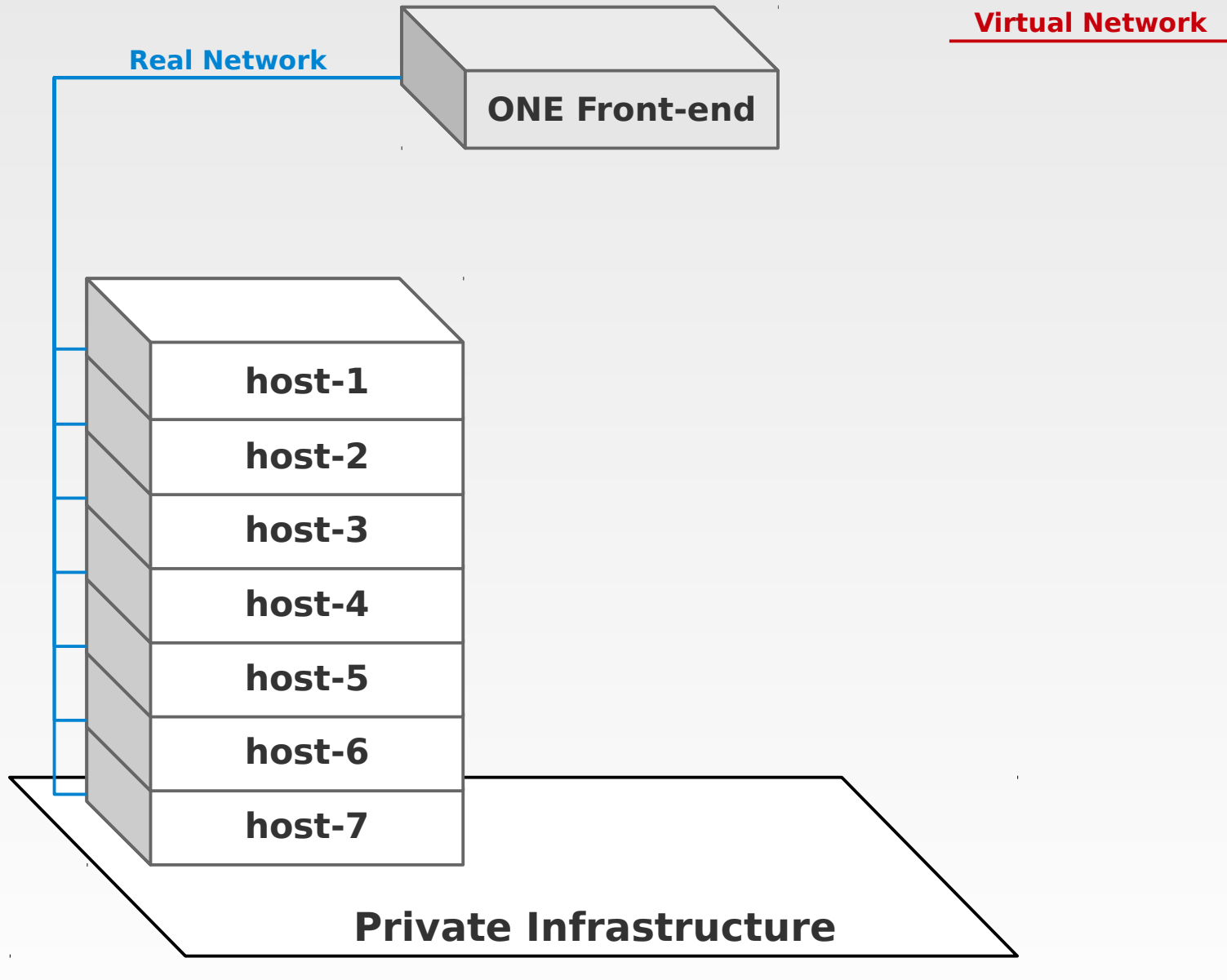
LEASES = [IP=130.10.0.4, MAC=50:20:20:20:20:23]

# 2 - ONE Architecture (Use case)

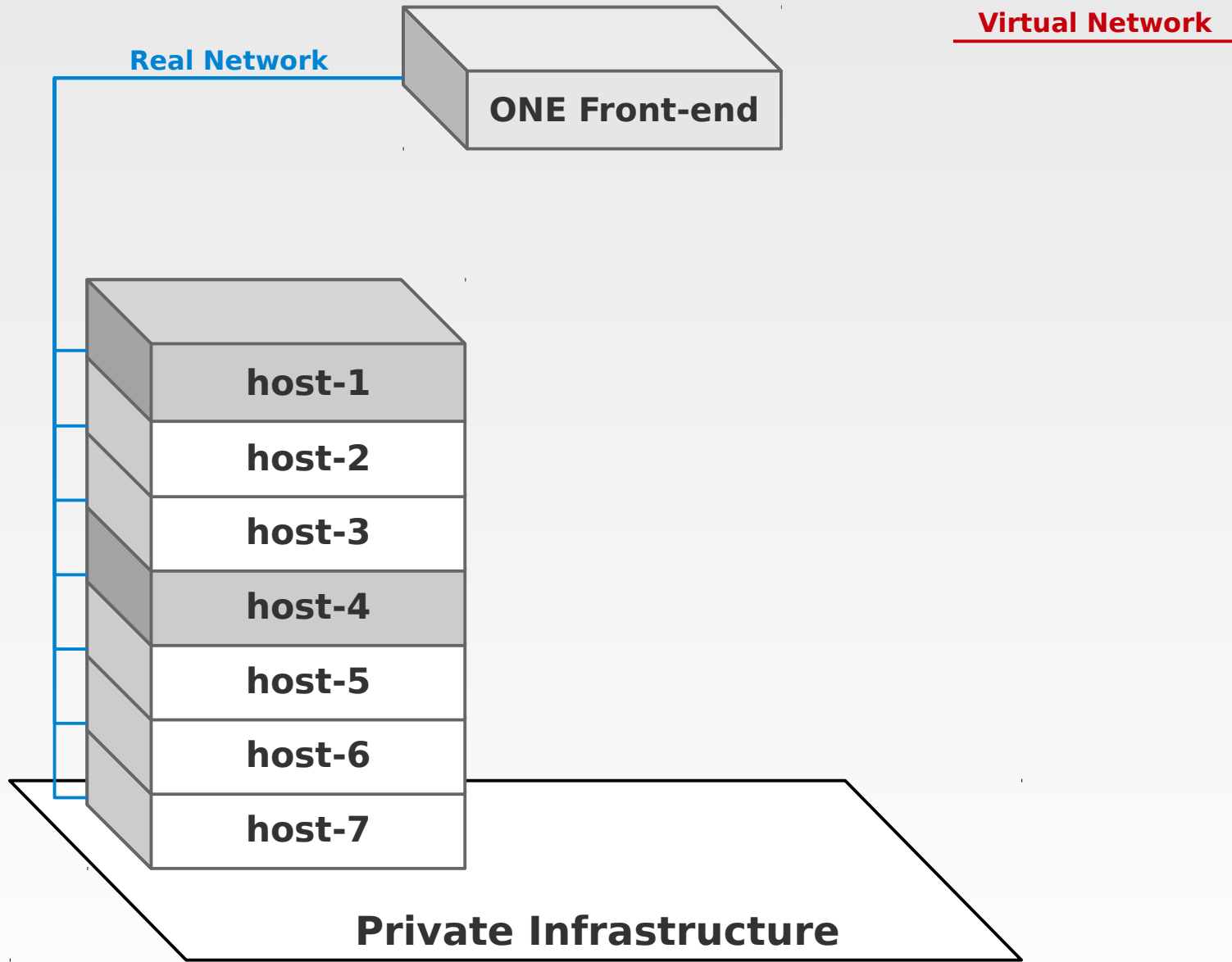




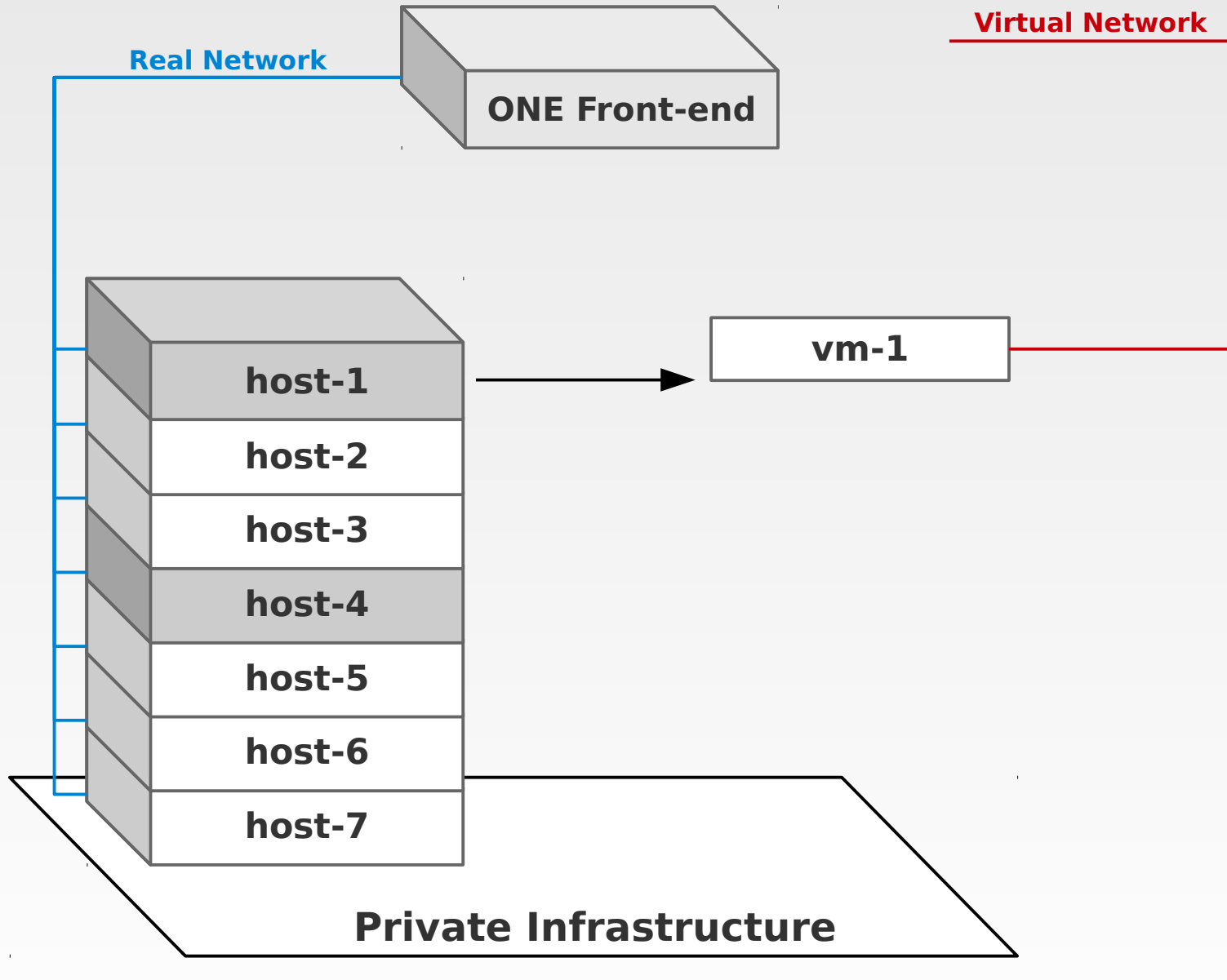
# 2 - ONE Architecture (Use case)



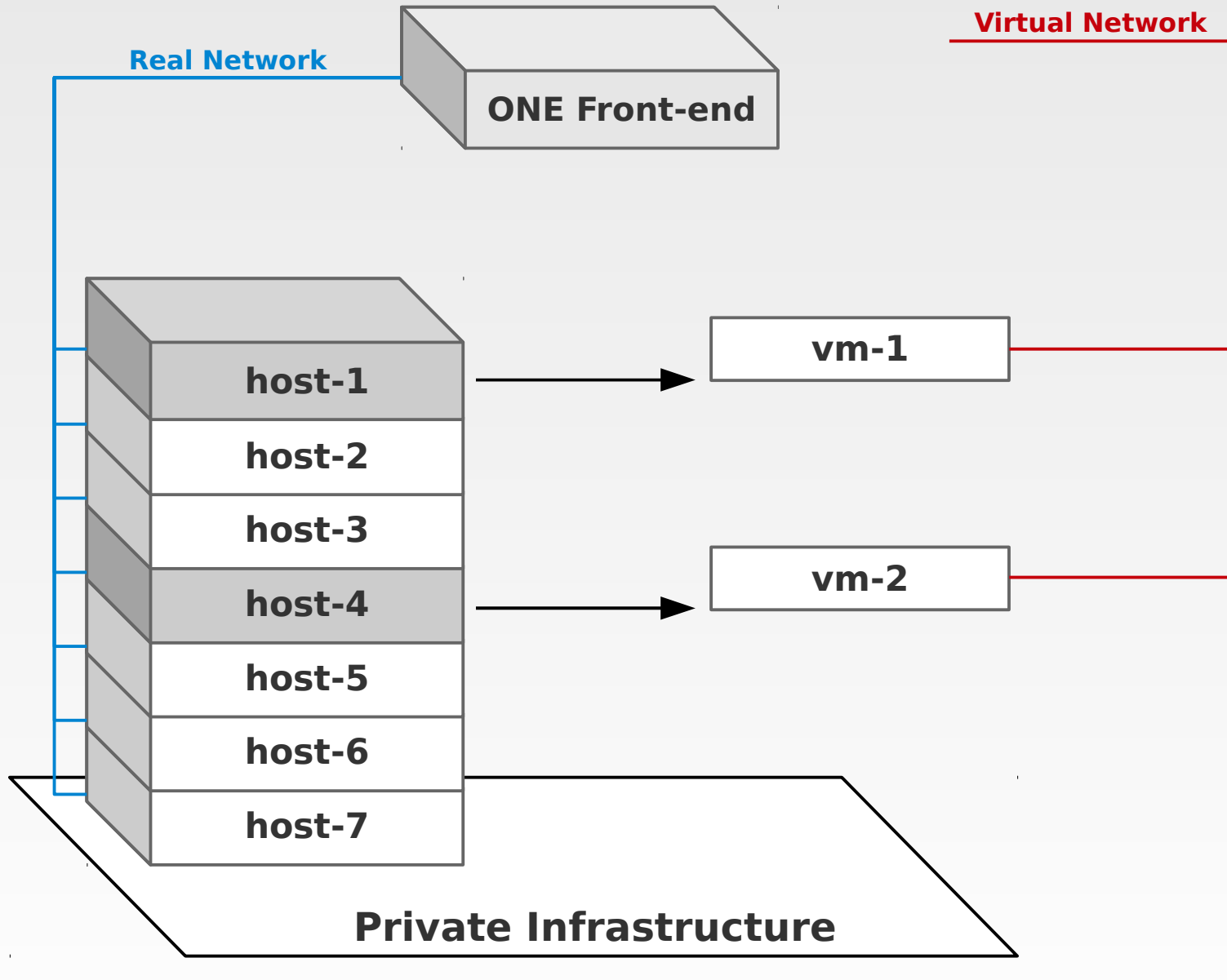
# 2 - ONE Architecture (Use case)



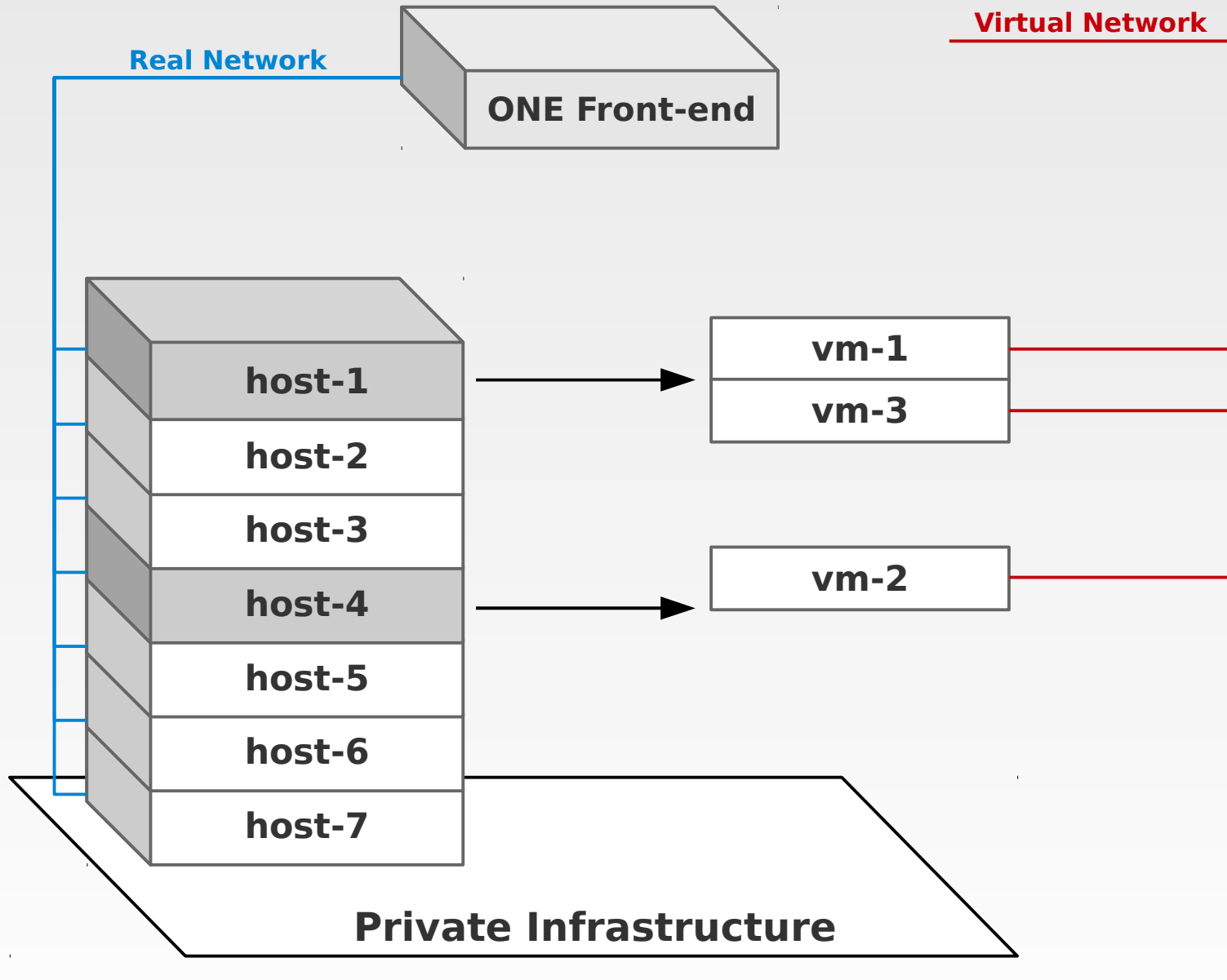
# 2 - ONE Architecture (Use case)



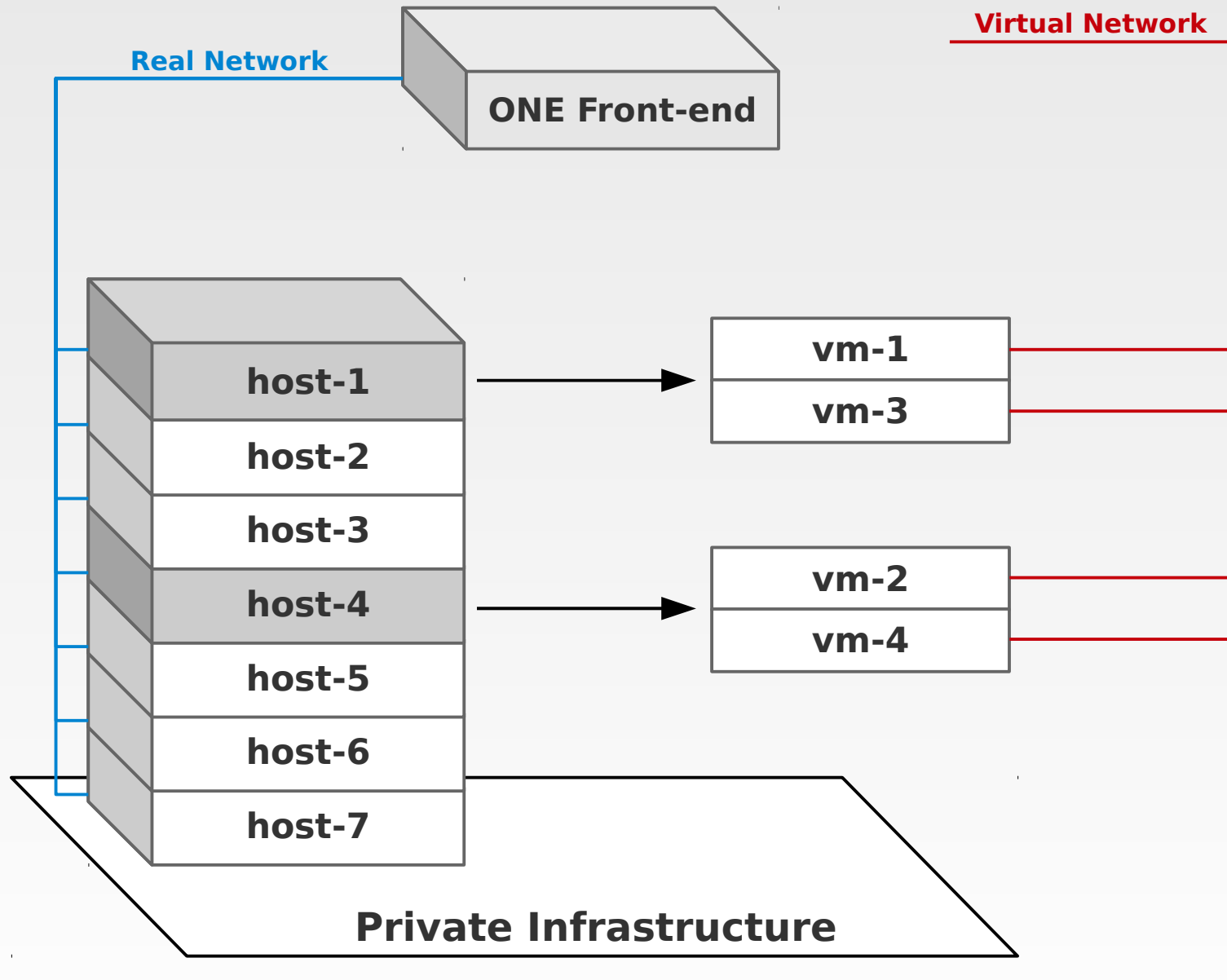
# 2 - ONE Architecture (Use case)



# 2 - ONE Architecture (Use case)



# 2 - ONE Architecture (Use case)



# 3 - Hands on: Private Cloud

## → Tutorial goals:

- Use Command-Line Interface in ONE Front-end.
- Use OpenNebula v1.4
- Verify Cloud status and usage
- Create your Virtual Machine
- Use this Virtual Machine
- Delete your Virtual Machine

# 3 - Hands on: Private Cloud

User

```
ssh -p 65000 guest-<id>@XX.XX.XX.XX  
Password: tclouds
```





# 3 - Hands on: Private Cloud



```
guest-<id>@s1:~$
```

```
$ ls  
template
```

```
$ cat template
```

```
NAME = vm-1-guest-1  
MEMORY = 512
```

```
OS = [ kernel = /usr/lib/xen-default/boot/hvmloader ]
```

```
DISK = [  
  source = oneadmin@s4:~oneadmin/images/default/tclouds.img,  
  target = xvda,  
  readonly = no ]
```

```
NIC = [ NETWORK = "Public"]
```

```
RAW = [ TYPE = "xen",  
DATA = "builder = 'hvm'
```

```
shadow_memory = 8
```

```
device_model = '/usr/lib/xen-default/bin/qemu-dm'
```

```
boot = \"c\""]
```

```
REQUIREMENTS = "HOSTNAME = \"s4\""
```

# 3 - Hands on: Private Cloud



**guest-`<id>`@s1:~\$**

**- Create your Virtual Machine:  
\$ `onevm create template`**

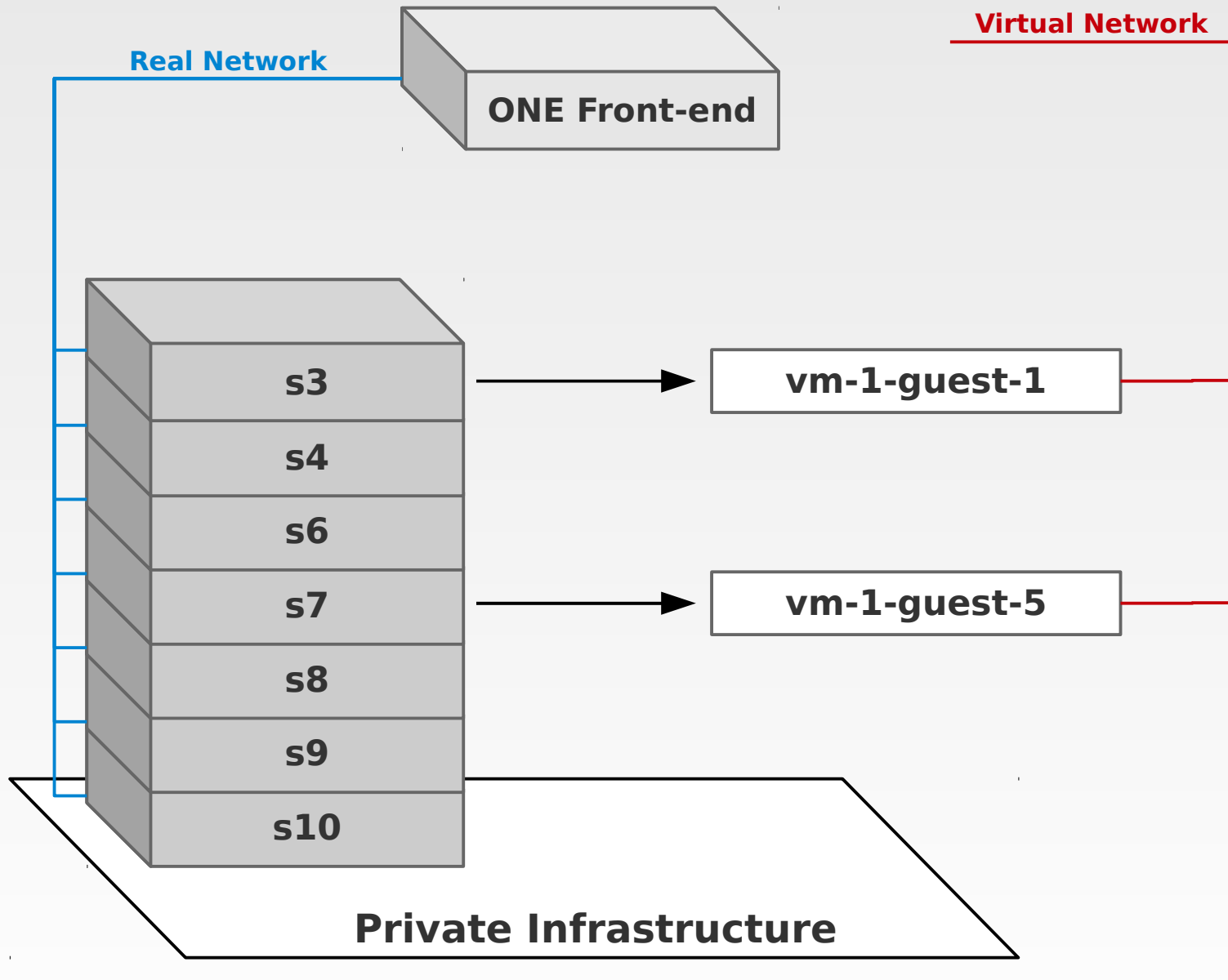
**\$ `onevm list`**

*Note: A Virtual Machine is properly running just when its status (STAT field) is "runn".*

**\$ `onevm show <vm-id>`**

*Note: Get the IP address of your Virtual Machine to connect in.*

# 3 - Hands on: Private Cloud



# 3 - Hands on: Private Cloud



**guest-`<id>`@s1:~\$**

**- *ONE-Nodes management:***

**\$ onehost list**

**\$ onehost show `<host-id>`**

**- *Virtual Networks management:***

**\$ onevnet list**

**\$ onevnet show `<vnet-id>`**

**- *Virtual Machines management:***

**\$ onevm list**

**\$ onevm show `<vm-id>`**

# 3 - Hands on: Private Cloud



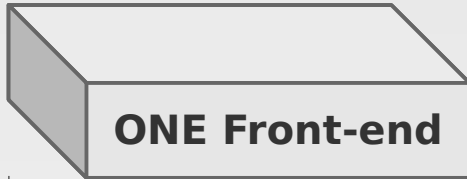
```
guest- $\langle id \rangle$ @s1:~$
```

```
$ ssh guest@ $\langle vm-IP \rangle$   
Password: tclouds
```

```
$ ssh root@ $\langle vm-IP \rangle$   
Password: tclouds
```

```
$ exit
```

# 3 - Hands on: Private Cloud



**guest-<id>@s1:~\$**

**- *Delete your VM:***

**\$ onevm delete <vm-id>**

# 4 - Final Considerations

## → Other Interesting Features:

- Shared or Remote Image Repository
- Image Management with oneimage tool (v2.0+)
- LDAP authentication in the Cloud and VMs
- User quota for CPU and memory usage (v2.0+)