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Transformasi IT Infrastructure Menjadi DevOps

Possible or Imposibble ?

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Jakarta, August 21, 2021

About Me

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what are we doing now
what are we doing now

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Agenda

- Digital Modeling And Conceptual For Infrastructure Devops
- What we are doing now ?

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DIGITAL MODELING AND CONCEPTUAL

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Enable Team in New Capabilities

Build Pilot Digital Infrastructure team to support deployment

Implement Effective Communication and Strategy

Formalize Service Catalogue and SLA

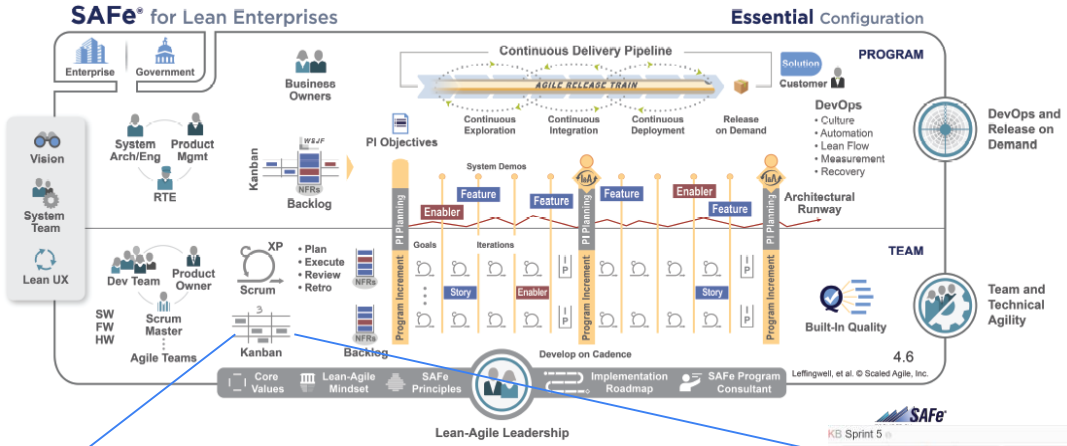
Culture Shift to change paradigm of Thinking

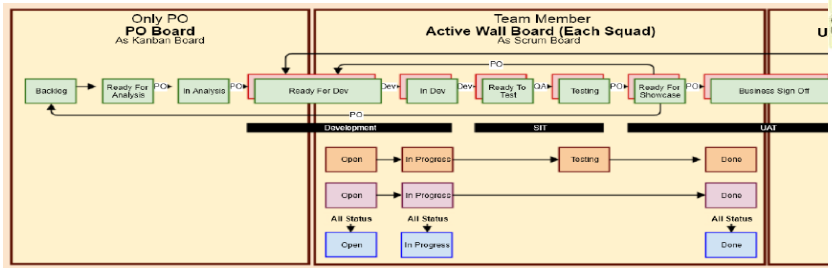
Define new operating Team Functions, Proses and Practices

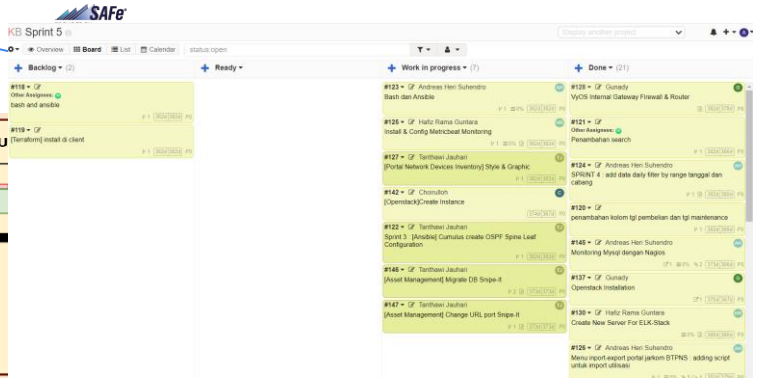
Define monitoring strategy and identify in depth capabilities

INFORMATION TECHNOLOGY

- Network as Code
- Pipeline Orchestration
- Micro and Immutable Architecture
- Orchestrated Upgrades
- Resiliency Design and Drills
- Continuous Measurement
- Continuous Response
- Continuous Improvement







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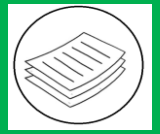
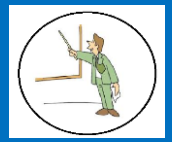
SERVICE RESPONSIBILITES AND SKILL MATRIX PREPARATION



SKILLS ASSESMENT

ORGANISE TRAINING



ON JOB TRAINING

DEFINE KPI

Prepare a Journey to Platform As A Services

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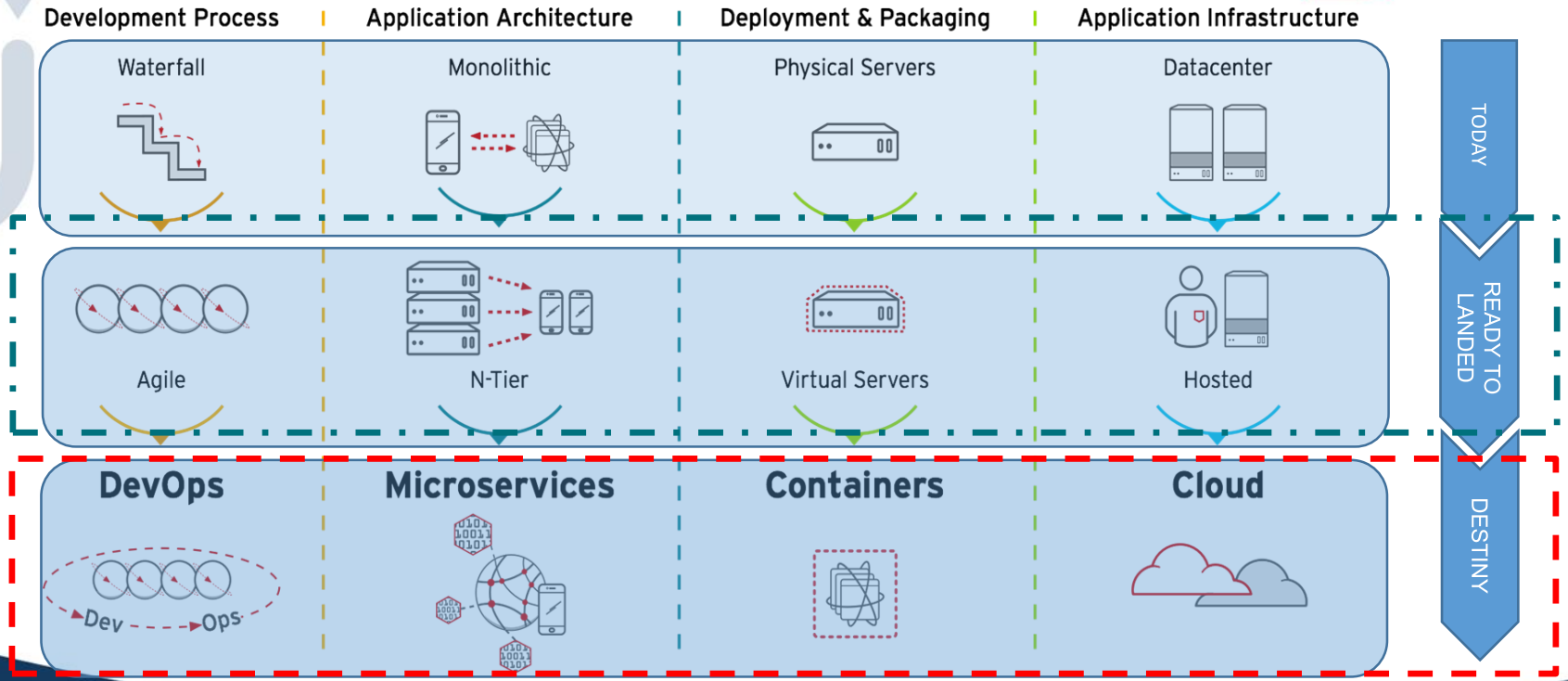
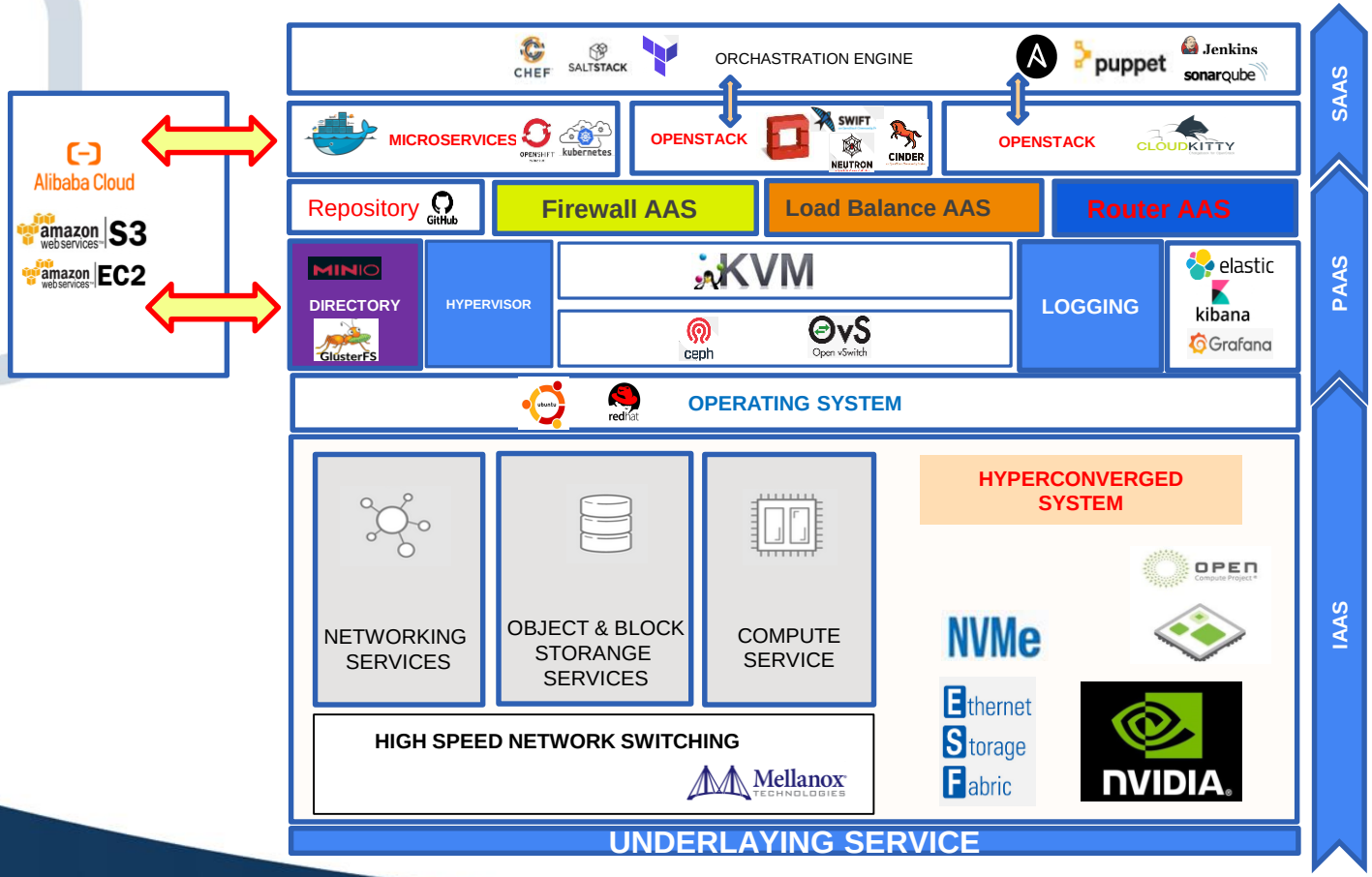


BUILD	INNOVATION STAGES	INNOVATION ACCELERATION
1	2	3
IaaS *Infrastructure as a Service*	**PaaS** *Platform as a Service*	**SaaS** *Software as a Service*
Providing a infrastructure to developers (across Business IT or Central IT) in a metered manner similar to using a utility e.g., electricity	**Providing a platform to developers** (across Business IT or Central IT) to build and manage applications	**Providing a software to users** (business team, IT teams or end-customers) typically with with very minimal configuration
Gives teams flexibility to work on any platform without worrying about underlying infrastructure	Makes the development, testing, and deployment of **applications quick & simple**	Users/ teams **simply consume the software** without worrying about build and maintenance
IT manages virtualization, servers, hard drives, storage, and networking	**IT manages** OS, virtualization, servers, storage, networking, and the PaaS software itself	**IT manages everything** - application, runtime, data, middleware, OS, virtualization, servers, storage and networking

	3 Month	3 Month	3 Month	3 Month
	Early Adopter	Innovation Stage	Acceleration Phase	Digital Transformation
	Introduce hyperconverged model into Bank using Hyperconverse Platform, meanwhile developing open source digital infrastructure model	Infra team start to introduce open source digital infrastructure model into production ready environment, in the meantime also enrich the capabilities	The infrastructure shift from IIAS into PAAS and Container model.	The infrastructure evolve into catalog model (private cloud).
CONTAINER	Use Hyperconverse Platform base Opensource	Research for PAAS pattern in : automation, integration and security	Research of SAS Model	Developing SAS Model
SAAS	Change the server management Compute, Storage, and Network and Openstack (Lab)	Develop Container Platform	PAAS become standard deployment model for infrastructure	Infra team already introduce PAAS Catalog to users.
PAAS	Adopt new hypervisor using Kernel Virtual Machine	Developing Openstack Capability & Integration	Container Platform implemented in production	Implementation of DevSecOps & DevNetOps
Server	Introducing Spine Leaf Architecture (Open Networking & Open Compute)	Use KVM based Hypervisor for UAT & Dev environment	Openstack already implement in Production	Openstack become standard platform
Hypervisor	Change storage model from SAN based into hyperconverged based.	Introduction of VXLAN concept in digital infrastructure	KVM become standard hypervisor	Integration of multiple hypervisor
Network	AMD/INTEL Platform Physical Server	Creating high speed hyperconverged storage based on open technology	VXLAN implemented on production	Active-Active Datacenter
Storage		AMD/INTEL Physical Server	High Speed Hyperconverged Storage	Combination of multiple storage
Hardware			Mainly Commodity Hardware	Commodity Hardware



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WHAT ARE WE DOING NOW ?

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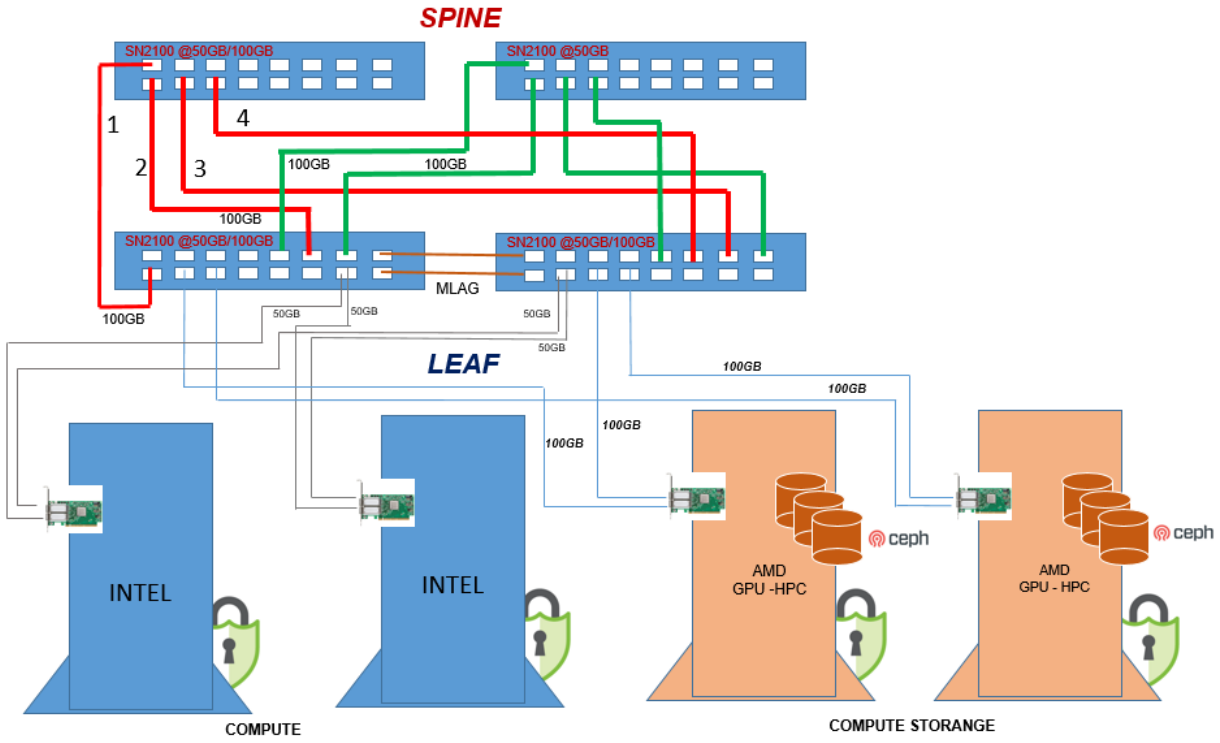
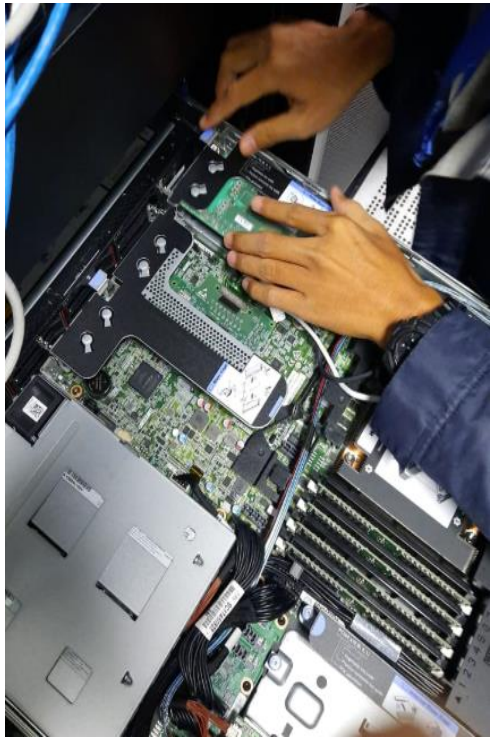
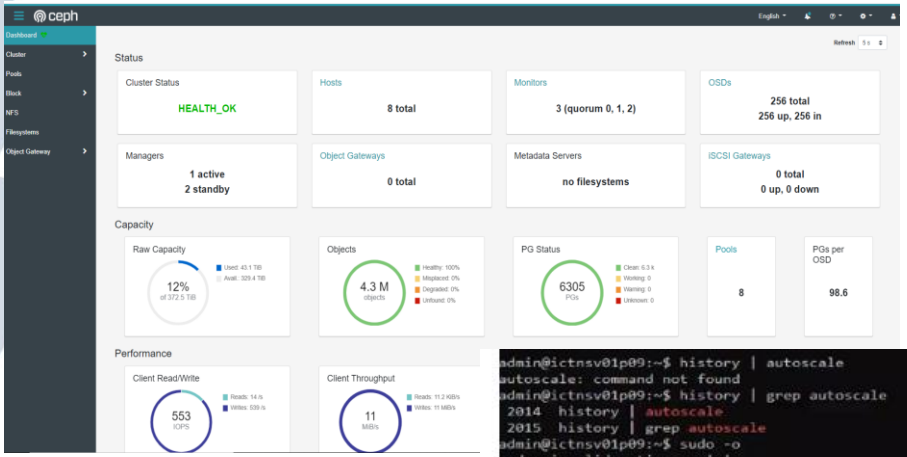

SPINE
SN2100 @50GB/100GB
SN2100 @50GB
1
2
3
4
100GB
100GB
100GB
100GB
SN2100 @50GB/100GB
SN2100 @50GB/100GB
MLAG
50GB
50GB
50GB
50GB
LEAF
100GB
100GB
100GB
100GB
INTEL
INTEL
AMD
GPU -HPC
AMD
GPU - HPC
ceph
ceph
COMPUTE
COMPUTE STORANGE



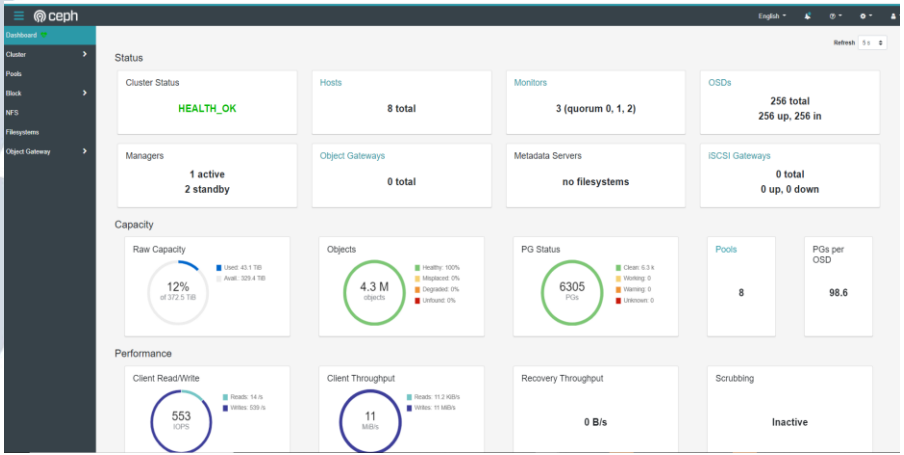
```
c4:00.0 Non-Volatile memory controller: Micron Technology Inc Device 51b2 (rev 02)
c5:00.0 PCI bridge: ASPEED Technology, Inc. AST1150 PCI-to-PCI Bridge (rev 04)
root@iconsv05r09:~# lspci | grep Mellanox
43:00.0 Infiniband controller: Mellanox Technologies MT28908 Family [ConnectX-6]
43:00.1 Infiniband controller: Mellanox Technologies MT28908 Family [ConnectX-6]
root@iconsv05r09:~#
```

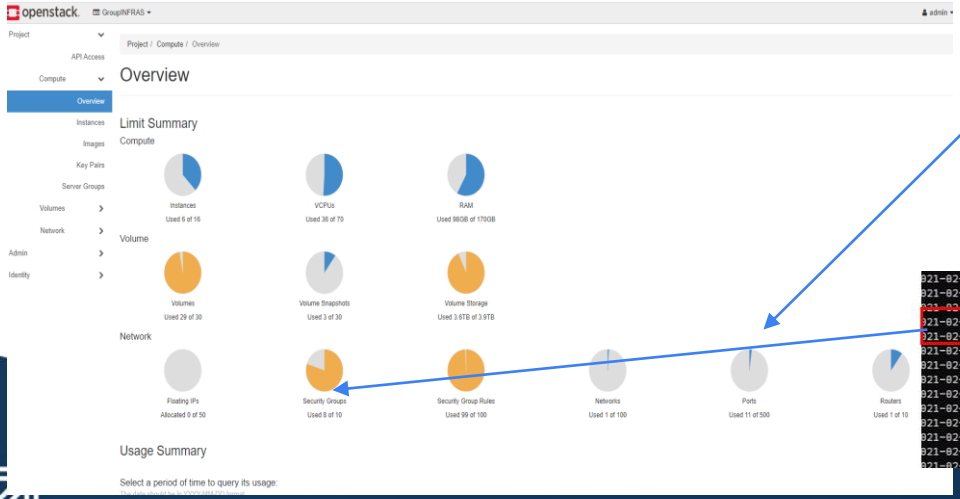
```
root@iconsv02r09:/home/compute-02# mlxconfig -d /dev/mst/mt4123_pciconf0 set LINK_TYPE_P1=2 LINK_TYPE_P2=2

Device #1:
----------

Device type:    ConnectX6
Name:           MCX653106A-ECA_Ax
Description:    ConnectX-6 VPI adapter card; HDR100; EDR IB and 100GbE; dual-port QSFP56; PCIe3.0 x16; tall bracket;
ROHS R6
Device:         /dev/mst/mt4123_pciconf0

Configurations:                          Next Boot       New
        LINK_TYPE_P1                     IB(1)           ETH(2)
        LINK_TYPE_P2                     IB(1)           ETH(2)

 Apply new Configuration? (y/n) [n] : y
```

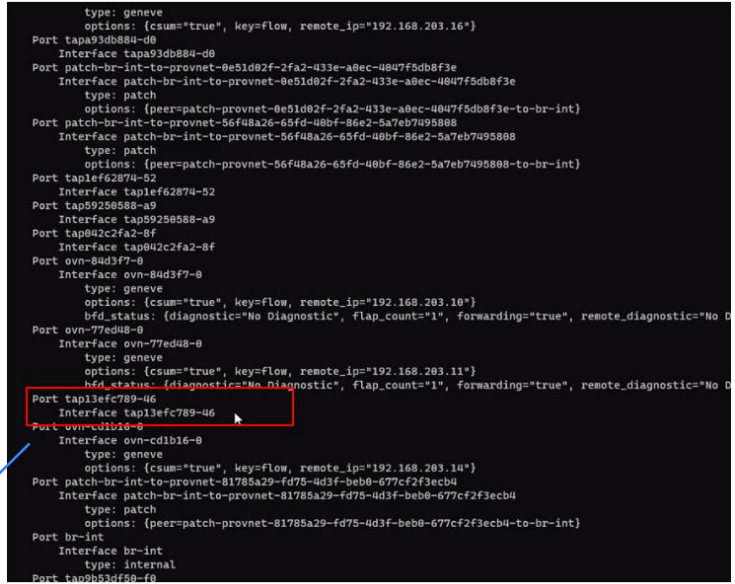
```
root@iconsv02r09:/home/compute-02# ip link
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode DEFAULT group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: ens1f0: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN mode DEFAULT group default qlen 1000
    link/ether 04:3f:72:e9:ad:9a brd ff:ff:ff:ff:ff:ff
3: ens1f1: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN mode DEFAULT group default qlen 1000
    link/ether 04:3f:72:e9:ad:9b brd ff:ff:ff:ff:ff:ff
4: enx26b426893812: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN mode DEFAULT group default qlen 1000
    link/ether 26:b4:26:89:38:12 brd ff:ff:ff:ff:ff:ff
root@iconsv02r09:/home/compute-02# _
```

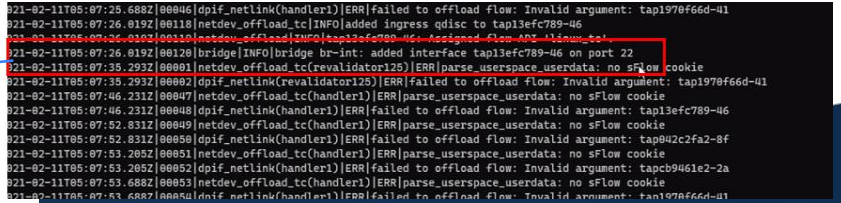



```
admin@ictnsv01p09:~$ history | autoscale
autoscale: command not found
admin@ictnsv01p09:~$ history | grep autoscale
 2014  history | autoscale
 2015  history | grep autoscale
admin@ictnsv01p09:~$ sudo -o
sudo: invalid option -- 'o'
usage: sudo -h | -K | -k | -V
usage: sudo -v [-AknS] [-g group] [-h host] [-p prompt] [-u user]
usage: sudo -l [-AknS] [-g group] [-h host] [-p prompt] [-U user] [-u user] [command]
usage: sudo [-AbEHknPS] [-r role] [-t type] [-C num] [-g group] [-h host] [-p prompt] [-T timeout] [-u user] [VAR=value] [-i|-s] [<command>]
usage: sudo -e [-AknS] [-r role] [-t type] [-C num] [-g group] [-h host] [-p prompt] [-T timeout] [-u user] file ...
admin@ictnsv01p09:~$ sudo -i
root@ictnsv01p09:~# history | grep autoscale
 1898  ceph osd pg_autoscale status
 1899  ceph pg_autoscale status
 1901  ceph --help | grep autoscale
 1902  ceph osd pool autoscale-status
 1906  ceph osd pool autoscale-status
 2000  history | grep autoscale
root@ictnsv01p09:~# ceph osd pool autoscale-status
POOL                    SIZE  TARGET SIZE  RATE  RAW CAPACITY   RATIO  TARGET RATIO  EFFECTIVE RATIO  BIAS  PG_NUM  NEW PG_NUM  AUTOSCALE
device_health_metrics  41520k               3.0        372.4T  0.0000                                  1.0       1              on
vms                     7282k               3.0        372.4T  0.0000                                  1.0      32              on
images                 32555k               3.0        372.4T  0.0000                                  1.0      32              on
volumes                69096k               3.0        372.4T  0.0000                                  1.0      32              on
backups                    0                3.0        372.4T  0.0000                                  1.0      32              on
vms-data               34324M               1.5        372.4T  0.0001        0.0001          0.0022    1.0      32              on
images-data             3705G               1.5        372.4T  0.0146        0.0144          0.3158    1.0     512              on
volumes-data            7656G               1.5        372.4T  0.0301        0.0311          0.6820    1.0    2048              on
backups-data               0                1.5        372.4T  0.0000                                  1.0      32              on
```









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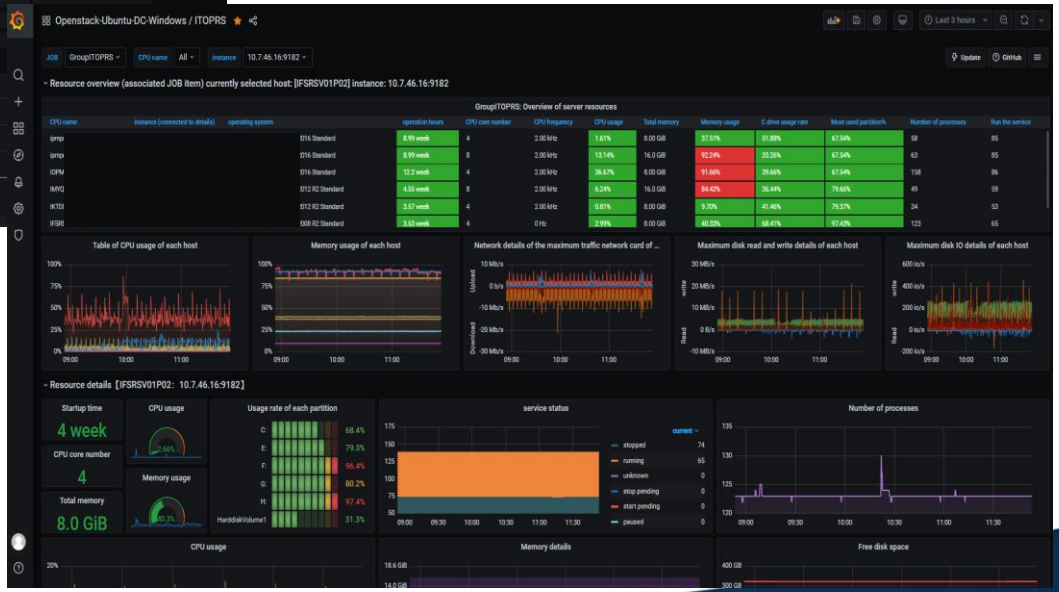
```
virsh # dumpxml instance-000003e5
<domain type='kvm' id='55'>
  <name>instance-000003e5</name>
  <uuid>3f398fc1-aec0-43cf-afbc-e03ad754f935</uuid>
  <metadata>
    <nova:instance xmlns:nova="http://openstack.org/xmlns/libvirt/nova/1.0">
      <nova:package version="21.1.0"/>
      <nova:name>BCAGSV04P09</nova:name>
      <nova:creationTime>2021-02-16 09:15:13</nova:creationTime>
      <nova:flavor name="m1.tiny3.migrate">
        <nova:memory>8192</nova:memory>
        <nova:disk>80</nova:disk>
        <nova:swap>0</nova:swap>
        <nova:ephemeral>0</nova:ephemeral>
```

```
</controller>
<interface type='bridge'>
  <mac address='fa:16:3e:ef:4e:3b'/>
  <source bridge='br-int'/>
  <virtualport type='openvswitch'>
    <parameters interfaceid='0904a5bf-552c-4009-abc9-54bae74e2878'/>
  </virtualport>
  <target dev='tap0904a5bf-55'/>
  <model type='virtio'/>
```

```
:/qemu/domain-55-instance-000003e5/master-key.aes -machine pc-i440fx-4.2,accel=kvm,usb=off,dump-guest-core=off -cpu EPYC-Rome,x2a
:rial0,bus=pci.0,addr=0x5 -object secret,id=libvirt-1-storage-secret0,data=ioVTw6Ph8iQd77fw9Gv88VBR1c6HsRn3FHlZR3sxi70=,keyid=mas
),vhost=on,vhostfds=46:47 -device virtio-net-pci,mq=on,vectors=6,host_mtu=9000,netdev=hostnet0,id=net0,mac=fa:16:3e:8e:92:f0,bus=
```

Beda Mac address
Ada Bug

```
virsh # dumpxml instance-000003e5
<domain type='kvm' id='55'>
  <name>instance-000003e5</name>
  <uuid>3f398fc1-aec0-43cf-afbc-e03ad754f935</uuid>
  <metadata>
    <nova:instance xmlns:nova="http://openstack.org/xmlns/libvirt/nova/1.0">
      <nova:package version="21.1.0"/>
      <nova:name>BCAGSV04P09</nova:name>
      <nova:creationTime>2021-02-16 09:15:13</nova:creationTime>
      <nova:flavor name="m1.tiny3.migrate">
        <nova:memory>8192</nova:memory>
        <nova:disk>80</nova:disk>
        <nova:swap>0</nova:swap>
        <nova:ephemeral>0</nova:ephemeral>
        <nova:vcpus>2</nova:vcpus>
      </nova:flavor>
      <nova:owner>
        <nova:user uuid="9637fdcd0f754c708d82757455430a2f">admin</nova:user>
        <nova:project uuid="446e4ef9d08c456ea9a4302ec294b207">GroupBINOJK</nova:project>
      </nova:owner>
    </nova:instance>
  </metadata>
  <memory unit='KiB'>8388608</memory>
  <currentMemory unit='KiB'>8388608</currentMemory>
  <vcpu placement='static'>2</vcpu>
  <cputune>
    <shares>2048</shares>
  </cputune>
```



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