

変える力を、ともに生み出す。

NTT DATAグループ



Live Migration Support



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- Everyone agreed with implementing live migration feature to the OpenStack.
- Next task is to decide the goal of Bexer release.
- **“Implementing the basic functionality at the simplest way”** is our target.

[Basic functionality]

No	Explanation
1	VM instance can use same floating/fixed ip, security group, VLAN.
2	VM instance can keep mounting EBS volume

[simplest implementation]

No	Explanation
1	Only Admin can use (meaning using nova-manage).
2	Not using EC2/OpenStack API
3.	Can be used if hypervisor is KVM
4.	Shared storage is necessary for the directory where VM images are copied from S3, and the directory which volumes are created.

The following 3 programs are inevitable to achieve live migration.

1. Live migration
 2. Get a VM instances list running on the physical machine.
 3. Provide info which physical machine still has enough machine resource.
- (※ The above functionalities can be achieved through EC2/OpenStack API)

Example:

```
# nova-manage migrate live instance-1111 compute-node2
                        instance-id destination
```

Someone give us a comment that feature already implemented to openstack. If so, we don't need to implement. b/c its admin only feature.

```
# nova-manage describe instances
```

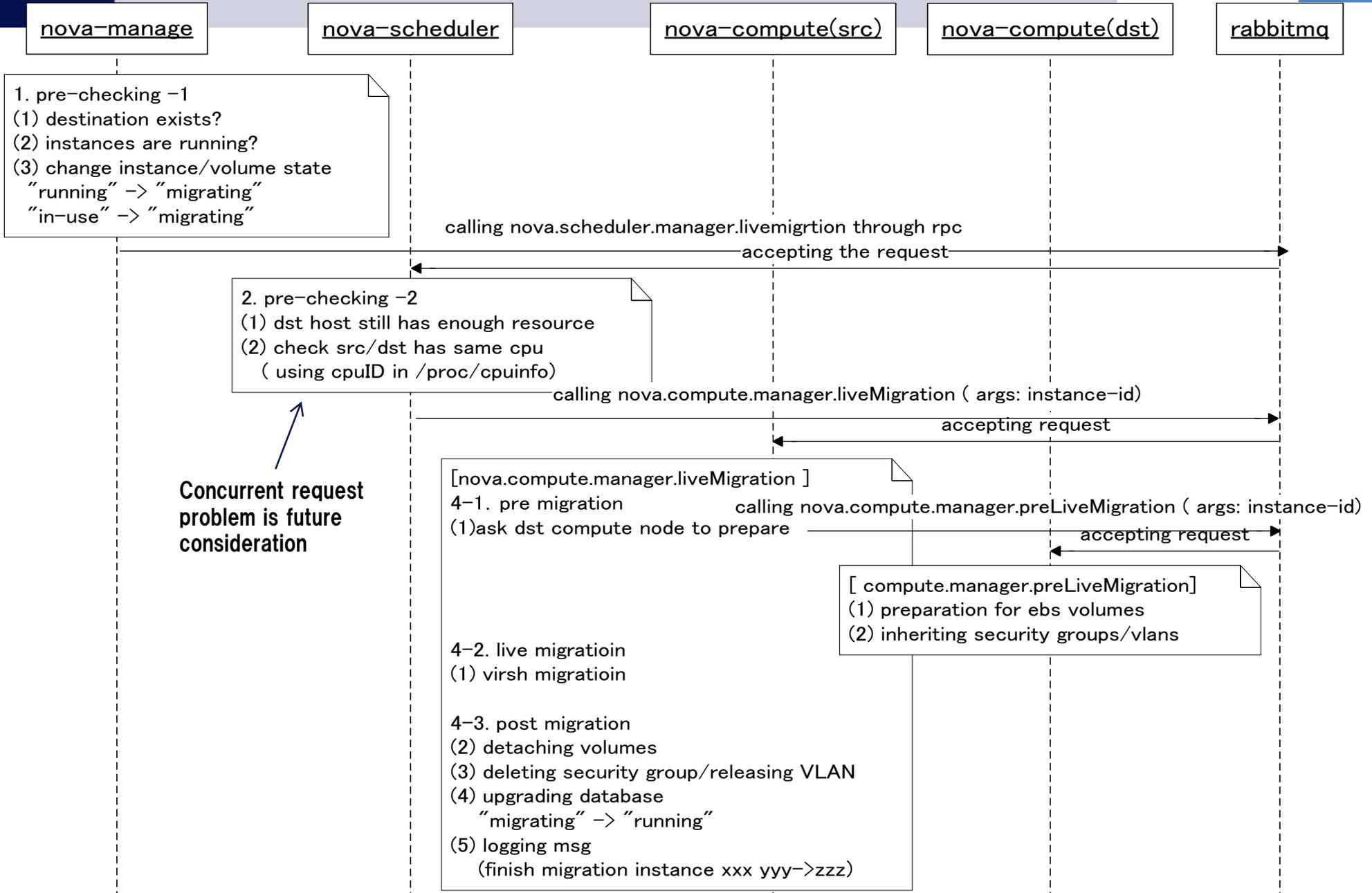
```
INSTANCE i-45610761 0.0.0.0 0.0.0.0 pending 0 c1.medium 2010-04-01T04:44:10.774Z cluster1 eki-30D00D36 eri-8FC50F4E compute-node1
INSTANCE i-45610761 emi-18240C94 0.0.0.0 0.0.0.0 pending 0 c1.medium 2010-04-01T04:44:10.774Z cluster1 eki-30D00D36 eri-8FC50F4E compute-node2
```

```
# nova-manage describe physicalresource host1 ( no hostname given, getting info from all physical machine)
```

TOTAL	host1		10	20480	1000	(total resource per physical machine)
NODE	host1	project1	5	10240	100	(usage per project)
NODE	host1	project2	2	5012	30	

(nodename - projectname - total cpu usage - total memory usage - total HDD usage)

5. Design (live migration)



➤ How to execute

```
# nova-manage describe instances
```

```
INSTANCE i-45610761 0.0.0.0 0.0.0.0 pending 0 c1.medium 2010-04-01T04:44:10.774Z cluster1 eki-30D00D36 eri-8FC50F4E compute-node1
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```

➤ Implementation

1. User executes above commands
2. The command searches the “instance” table on DB, and getting information.

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➤ How to execute

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TOTAL host1          10      20480      1000      (total resource per physical machine)
NODE  host1      project1      5      10240      100      ( usage per project)
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```

(nodename - projectname - total cpu usage - total memory usage - total hdd usage)

➤ Implementation

1. Scheduler asks any compute node about cpu/memory/HDD info, and cpufreq in /proc/cpuinfo at boot time (also regularly?), and store them on DB (service table is better?)
cpufreq is used for checking compatibility for live migration of different cpus.
2. User executes commands
3. The command gets any info from DB.

6. The policy for handling exceptions/errors.

➤ For unrecoverable errors (from Hypervisor point of view)

1. Logging error messages.
2. Doing the same way as terminating instances.

(Delete any records about the instance from DB. If DB records for terminated instances remains for a while, please let me know.)

**The below considerations will not be included for Bexar release.
The discussions for future versions may be begun later.**

- **Other hypervisors support**
- **Other network managers support**
- **Using VPN considerations**
- **Block Migration (a live migration that shared storage is not necessary.)**
- **Other functionalities that newly added from Bexar release.**

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