Monitoring an Openstack cluster

with icinga/nagios

Benedikt Trefzer

Cirrax GmbH

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CIRRAX

Cirrax GmbH

Cirrax GmbH since 2011

- based in Bern (Switzerland)
- Linux and network consulting and engineering
- Project Management
- Private and Public OpenStack Cloud
- Active contributors to OpenStack and other OpenSource projects

Our objectives

- one tool for system status: icinga/nagios
- monitor generic resources like memory, disk, CPU etc.
- monitor external availability of services like https, ping etc.
- openstack-nagios-plugins to monitor openstack health
  - similar to OpenStack client tools
  - written in python
  - use OpenStack libraries
  - use nagiosplugin library
  - hosted on github
  - contributions welcome!

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Check services

./check_nova-services

```
$ nova hypervisor-stats
+----------------------+-------+
| Property             | Value |
+----------------------+-------+
| count                | 2     |   # 2 compute nodes
| current_workload     | 0     |
| disk_available_least | 98    |
| free_disk_gb         | 97    |
| free_ram_mb          | 6394  |
| local_gb             | 98    |
| local_gb_used        | 1     |
| memory_mb            | 7930  |   # total memory
| memory_mb_used       | 1536  |   # memory uses by vm's
| running_vms          | 1     |
| vcpus                | 4     |   # total vcpus
| vcpus_used           | 1     |   # vcpus used by vm's
+----------------------+-------+

$ ./check_nova-hypervisors
NOVAHYPERVISORS OK - [memory_used:1536 memory_percent:19 vcpus_used:1 vcpus_percent:25
                                                          running_vms:1] |

    memory_percent=19;90;95;0;100
    memory_used=1536;;;0;7930
    running_vms=1;;;0
    vcpus_percent=25;90;95;0;100
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| Id | Binary           | Host   | Zone | Status   | State | Updated at   | Disabled R. |
+----+------------------+--------+------+----------+-------+--------------+-------------+
| 1  | nova-conductor   | 0.t.ch | nova | enabled  | up    | ...T14:09:02 | -           |
| 2  | nova-consoleauth | 0.t.ch | nova | enabled  | up    | ...T14:09:05 | -           |
| 3  | nova-scheduler   | 0.t.ch | nova | enabled  | up    | ...T14:09:04 | -           |
| 4  | nova-cert        | 0.t.ch | nova | enabled  | up    | ...T14:09:04 | -           |
| 5  | nova-compute     | 1.t.ch | nova | enabled  | up    | ...T14:09:03 | -           |
| 6  | nova-compute     | 2.t.ch | nova | enabled  | down  | ...T14:09:01 | -           |
| 7  | nova-compute     | 3.t.ch | nova | disabled | down  | ...T14:09:09 | Maintenance |
+----+------------------+--------+------+----------+-------+--------------+-------------+

$ ./check_nova-services
NOVASERVICES CRITICAL - [up:5 disabled:1 down:2 total:7] | disabled=1;@1:;;0 down=........

$ ./check_nova-services --host 1.t.ch
NOVASERVICES OK - [up:1 disabled:0 down:0 total:1] | disabled=0;@1:;;0 down=........

$ ./check_nova-services --binary nova-compute
NOVASERVICES CRITICAL - [up:1 disabled:1 down:2 total:3] | disabled=1;@1:;;0 down=........
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```

Check services/agents

cinder and neutron

```
$ cinder service-list
+------------------+--------+------+---------+-------+--------------+
|      Binary      | Host   | Zone |  Status | State | Updated_at   |
+------------------+--------+------+---------+-------+--------------+
| cinder-scheduler | 0.t.ch | nova | enabled |   up  | ...T09:26:42 |
|  cinder-volume   | 0.t.ch | nova | enabled |   up  | ...T09:26:46 |
+------------------+--------+------+---------+-------+--------------+
$ ./check_cinder-services
CINDERSERVICES OK - [up:2 disabled:0 down:0 total:2] | disabled=0;@1:;;0 down=...

$ neutron agent-list
+------+--------------------+--------+-------+----------------+---------------------------+
| id   | agent_type         | host   | alive | admin_state_up | binary                    |
+------+--------------------+--------+-------+----------------+---------------------------+
| 6... | Loadbalancer agent | 0.t.ch | :-]   | True           | neutron-lbaas-agent       |
| e... | L3 agent           | 0.t.ch | :-]   | True           | neutron-l3-agent          |
| b... | Open vSwitch agent | 2.t.ch | :-]   | True           | neutron-openvswitch-agent |
| b... | Open vSwitch agent | 1.t.ch | :-]   | True           | neutron-openvswitch-agent |
| 7... | Open vSwitch agent | 0.t.ch | :-]   | True           | neutron-openvswitch-agent |
| e... | Metadata agent     | 0.t.ch | :-]   | True           | neutron-metadata-agent    |
| 1... | Metering agent     | 0.t.ch | :-]   | True           | neutron-metering-agent    |
| 7... | DHCP agent         | 0.t.ch | :-]   | True           | neutron-dhcp-agent        |
+------+--------------------+--------+-------+----------------+---------------------------+
$ ./check_neutron-agents
NEUTRONAGENTS OK - [up:8 disabled:0 down:0] | disabled=0;@1:;;0 down=...
```

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Check services/agents

cinder and neutron

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$ cinder service-list
+------------------+--------+------+---------+-------+--------------+
|      Binary      | Host   | Zone |  Status | State | Updated_at   |
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| cinder-scheduler | 0.t.ch | nova | enabled |   up  | ...T09:26:42 |
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NEUTRONAGENTS OK - [up:8 disabled:0 down:0] | disabled=0;@1:;;0 down=...
```

Floating IP's

```
$ neutron floatingip-list
+------+------------------+---------------------+---------+
| id   | fixed_ip_address | floating_ip_address | port_id |
+------+------------------+---------------------+---------+
| f... |                  | xxx.xxx.xxx.9       |         |
| 5... | 192.168.0.13     | xxx.xxx.xxx.20      | 4...    |
| 2... | 192.168.0.12     | xxx.xxx.xxx.3       | 2...    |
+------+------------------+---------------------+---------+

$ ./check_neutron-floatingips -c 0:230 -w 0:200
NEUTRONFLOATINGIPS OK - [assigned:3 used:2] | assigned=3;200;230;0 used=2;;;0
```

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+------+------------------+---------------------+---------+
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$ ./check_neutron-floatingips -c 0:230 -w 0:200
NEUTRONFLOATINGIPS OK - [assigned:3 used:2] | assigned=3;200;230;0 used=2;;;0
```

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Ceilometer statistics

- ceilometer stores samples for events in the cloud
- regularly triggered audit events for usage
- data is used to measure past usage of OpenStack (eg for billing)

```
$ ./check_ceilometer-statistics -m volume
CEILOMETERSTATISTICS OK - [age:26.21m count:88samples value:1volume] | age=...
```

- we use this test to verify freshness of meters.

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Rally

- Rally is a benchmarking tool
- run automated scenarios on a deployed cloud
- example scenario: boot and delete server
- one rally run: several iterations of different scenarios
- possibility to specify SLA

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Rally

Screenshots

Rally benchmark results

Benchmark overview

Input file

▼ NovaServers

boot_and_delete_server

NovaServers.boot_and_delete_server (143.596s)

Overview | Details | Input task

Load duration: **139.569 s** Full duration: **143.596 s** Iterations: **10** Failures: **0**

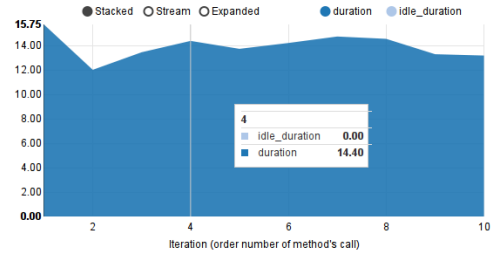
Service-level agreement

Criterion	Detail	Success
max_seconds_per_iteration	Maximum seconds per iteration 15.75s <= 25.00s - Passed	True
failure_rate	Failure rate criteria 0.00% <= 0.00% <= 0.00% - Passed	True

Total durations

Action	Min (sec)	Avg (sec)	Max (sec)	90 percentile	95 percentile	Success	Count
nova.boot_server	9.414	10.837	13.055	11.749	12.402	100.0%	10
nova.delete_server	2.604	3.11	4.931	3.55	4.241	100.0%	10
total	**12.028**	**13.946**	**15.748**	**14.861**	**15.304**	**100.0%**	**10**

Charts for the Total durations



Rally benchmark results

Benchmark overview

Input file

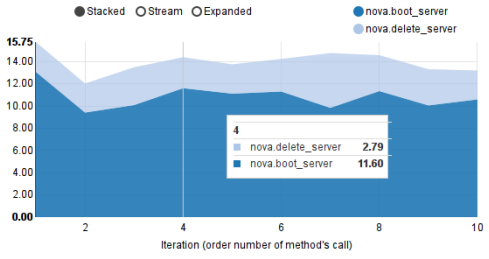
▼ NovaServers

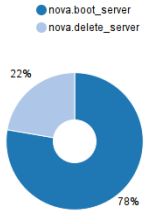
boot_and_delete_server

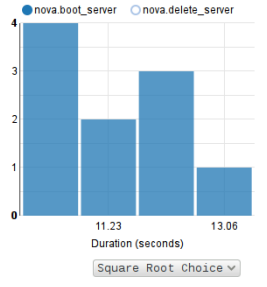
NovaServers.boot_and_delete_server (143.596s)

Overview | Details | Input task

Charts for each Atomic Action







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Rally

Nagios/Icinga and Rally

- Rally stores all result in database
- Output as HTML or json
- summarize json result for nagios/icinga

```
$ rally task results | ./check_rally-results

RALLYRESULTS OK - [errors:0 slafail:0] |
    errors=0;0;0 fulldur=542.087836981s loaddur=222.671538115s slafail=0;0;0 total=46
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links and questions

- this presentation:
  https://cirrax.com/downloads/2015_OpenstackMonitoring.pdf
- openstack-nagios-plugins:
  https://github.com/cirrax/openstack-nagios-plugins
- Rally:
  https://wiki.openstack.org/wiki/Rally
- nagiosplugin library:
  https://pypi.python.org/pypi/nagiosplugin/
- contact:
  benedikt.trefzer@cirrax.com