VSPERF CI

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Introduction

VSPERF CI consists of several jobs, which are integrated into OPNFV infrastructure. It means that jobs are triggered by OPNFV jenkins (daily job) or OPNFV gerrit (verify and merge jobs). The comprehensive list of jobs, their status and history is visible in VSPERF specific dashboard at https://build.opnfv.org/ci/view/vswitchperf/

There are two versions of each job, one is created for current stable branch and second for the master branch.

In case of the daily job, which executes a set of performance tests, the results are available also in the graphical form at VSPERF CI Results and test results, reports and logs are stored inside OPNFV artifacts at http://artifacts.opnfv.org/logs_vswitchperf_intel-pod12.html.

OPNFV Jenkins is operated by releng team and the configuration of jobs is stored in releng git repository. VSPERF specific part can be found at YAML file vswitchperf.yml. For more info on writing and using jibs see Jenkins Wow.

In order to have more flexible way of job configuration, VSPERF project stored detailed job configuration in VSPERF repository into build-vsperf.sh script, which is invoked by generic YAML job configuration above.

Links summary:

CI Dashboard: https://build.opnfv.org/ci/view/vswitchperf/

Daily job results:

- VSPERF output: check "console output" of selected job type at jenkins, e.g. for a daily job https://build.opnfv.org/ci/view/vswitchperf/job/vswitchperf-daily-master/lastSuccessfulBuild/consoleFull
- graphs: VSPERF CI Results

Job definition scripts:

- generic YAML (releng git repo): vswitchperf.yml
- job details (vsperf repo): build-vsperf.sh

CI JOBs

The VSPERF CI jobs are broken down into:

1. Daily job:
   a. It is executed at INTEL POD.
   b. Requires a traffic generator (Ixia)
   c. Runs everyday in case that new change was merged into particular branch since the last daily job execution; Daily job duration is about 14 hours, but it can take over a day in case that VM running IxNetwork is slow. Please see FAQ section below for details.
   d. A set of performance tests is executed for OVS with DPDK support, Vanilla OVS, VPP and SRIOV. Ixia traffic generator is used to generate RFC2544 Throughput and Back2Back traffic.

2. Merge job (similar to verify job):
   a. It is executed at INTEL POD or at Ericsson PODs.
   b. Does not require a traffic generator.
   c. Runs whenever patches are merged to the particular branch.
   d. Runs a basic set of integration testcases for OVS with DPDK support, Vanilla OVS and VPP.
   e. in case that documentation files were modified, then documentation is built.

3. Verify job (similar to merge job):
   a. It is executed at INTEL POD or at Ericsson PODs.
   b. Does not require a traffic generator.
   c. Runs every time a patch is pushed to gerrit. On success, the patch will be marked as verified (+1 for verification).
   d. Runs a basic set of integration testcases for OVS with DPDK support, Vanilla OVS and VPP.
e. in case that documentation files were modified, then documentation is built

NOTE: The list of testcases to be executed for particular job type is configured inside `build-vsperf.sh`. Please refer to configuration options `TESTCASES_*` and `TESTPARAM_*` for additional details.

**Where do VSPERF CI jobs run?**

VSPERF project has a dedicated POD hosted at Intel LAB. Please check [Intel POD12](https://build.opnfv.org/ci/computer/intel-pod12/) and VSPERF in Intel Pharos Lab - Pod 12 for details.

**DAILY JOB:**

It requires a traffic generator in order to execute the performance testcases. Thus this job is executed at POD12.

The status of Intel POD12 is visible in jenkins at: [https://build.opnfv.org/ci/computer/intel-pod12/](https://build.opnfv.org/ci/computer/intel-pod12/)

**VERIFY and MERGE JOB:**

They are executed at POD12 or at Ericsson pods as they don't require a traffic generator. POD12 is used as a primary jenkins slave, because execution at Ericsson build machines was not reliable since other projects start to use it more extensively. It seems, that there is a clash on resources (hugepages). There was a attempt to avoid a parallel execution of VSPERF and other jobs, but it didn't help. Contact for the Ericsson Pod: ________

**FAQ**

**Q:** Why VEFIY JOB has failed and my patch got -1 for verification?

**A:** Please check "console output" of failed job to find out a cause of failure. Them most common failures are:

1. **DPDK, OVS, QEMU or VPP can't be cloned from it's repository** and thus job fails. Example of console output in that case:

   ```
   Cloning into 'dpdk'...
   error: RPC failed; result=18, HTTP code = 200
   fatal: The remote end hung up unexpectedly
   fatal: early EOF
   fatal: index-pack failed
   make[1]: *** [dpdk] Error 128
   ```

   This is often a temporary case and it is enough to re-trigger the job, e.g. by inserting a comment "reverify" into gerrit review in question. If problem will persist, please get in touch with admins responsible for particular server to verify, that connection to the failing site is not blocked by firewall.

2. **PYLINT execution failed.** Please note, that all files have to pass with score "10" from pylint. Please check a console output for pylint verification details. Correct values are "OK" (i.e. score 10), "NA" (not a pylint code, e.g. a configuration file) or EXCLUDED (e.g. python 2.7. library). In case of pylint error, you will see a score (e.g. 9.64) and a list of detected pylint errors. It is essential to use the same version of pylint at your server. This is ensured by installation of vsperf requirements into your virtual environment by vsperf installation scripts or by execution of "pip install -r requirements.txt" from vsperf repository when your vsperf python virtual environment is active.

3. **Jenkins slave went offline** during job execution. Example of a console output in that case:

   ```
   FATAL: command execution failed
   java.nio.channels.ClosedChannelException
   at org.jenkinsci.remoting.protocol.NetworkLayer.onRecvcClosed(NetworkLayer.java:154)
   at org.jenkinsci.remoting.protocol.IOHub$OnReady.run(IOHub.java:721)
   at jenkins.util.ContextResettingExecutorService$2.run(ContextResettingExecutorService.java:28)
   at java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1149)
   at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:624)
   at java.lang.Thread.run(Thread.java:748)
   Caused: java.io.IOException: Backing channel 'JNLP4-connect connection from 10.30.0.3/10.30.0.3:34322' is disconnected.
   ...```

   There are two common causes:

   a. A connection between Jenkins server and jenkins slave (a server where tests where physically executed) was terminated. Please check [Jenkins GUI to find out the status of server](https://build.opnfv.org/ci/computer/) in question, e.g. at [https://build.opnfv.org/ci/computer/](https://build.opnfv.org/ci/computer/). If it is "offline" then it is always good to check a status of other servers in the same lab. For example in case that Intel POD12 is offline and other Intel PODxx are offline too, then it is some generic connection issue between Intel and OPNFV LAB. If such problem persists, then you should rise an INFRA ticket (if it is not there already). On the other hand if server is online ("idle"), then it was a temporary problem and job can be re-triggered again. In case that particular jenkins slave is offline for a long duration, then contact responsible administrator (in case of Intel-POD12 vsperf community can reboot it or access a console over web) for help.
b. A server was rebooted. It means, that shortly (up to 10 minutes) after the job failure the server is up and running (a status "idle" is visible in jenkins GUI). In that case, re-trigger the job. In case that job fails again with another reboot, then go ahead with inspection of "console output". In the past a reboots were observed at Intel-POD12 during execution of OVS Vanilla testcases. If this is the case, then please login at Intel-POD12 and **check what kernel version is running**. In case that CentOS specific kernel 3.10.xxx is active (uname -a), then you should update grub to use kernel 4.4. installed from epel repo. As of now (Apr 2018), recent versions of OVS and especially opensrswitch.io kernel module are having issues with recent modifications of 3.10.xxx kernels modified by RHT. Thus kernel 4.4. is used by default at Intel-POD12, however in case of OS update (yum update), the default kernel can be updated and selected by default by GRUB. It is often enough to update grub config to use kernel 4.4. by default and reboot the server. In case that regular reboots are observed at other PODs (e.g. ericsson), then you should get in touch with responsible admins. Hint: In case that default version of tool causing reboot (e.g. OVS) was changed, then you could try to push a (temporary?) patch to gerrit with older or newer version of tools to find out the version, which is "compatible" with OS at given jenkins slave. This information will be helpful during debugging and discussion with responsible administrators.

Q: Why DAILY JOB has failed?

A: Please firstly check answer to "VERIFY JOB has failed" above for causes common for all jobs. Please note then in case of DAILY job, INTEL POD12 is:

- Check if Jenkins slave process is running:
  ```
  [root@pod12-node3 ~]# ps -ef | grep jenkins
  root    17681 17647  0 15:23 pts/0  00:00:00 grep --color=auto jenk
  ```

You can also restart it if needed using "monit stop" and "monit start" commands. Example output:

```bash
[root@pod12-node3 ~]# monit status
```
Monit 5.25.1 uptime: 73d 5h 29m

Directory 'jenkins_piddir'
status          OK
monitoring status Monitored
monitoring mode  active
on reboot      start
permission     755
uid            1001
gid            1001
access timestamp Mon, 03 Dec 2018 09:54:12
change timestamp Wed, 13 Feb 2019 14:35:01
modify timestamp Wed, 13 Feb 2019 14:35:01
data collected Thu, 14 Feb 2019 15:23:51

Process 'jenkins'
status          OK
monitoring status Monitored
monitoring mode  active
on reboot      start
pid            12995
parent pid     1
uid            1001
effective uid  1001
gid            1001
uptime         1d 0h 48m
threads        53
children       0
cpu            0.0%
cpu total      0.0%
memory         0.7% [443.8 MB]
memory total   0.7% [443.8 MB]
security attribute (null)
disk read      0 B/s [81.8 MB total]
disk write     0 B/s [6.8 GB total]
data collected Thu, 14 Feb 2019 15:23:51

System 'pod12-node3.opnfv.local'
status          OK
monitoring status Monitored
monitoring mode  active
on reboot      start
load average   [0.00] [0.00] [0.00]
cpu            0.0%us 0.0%sy 0.0%wa
memory usage   15.2 GB [24.1%]
swap usage     0 B [0.0%]
uptime         73d 5h 30m
boot time      Mon, 03 Dec 2018 09:53:25
data collected Thu, 14 Feb 2019 15:23:51

Q: What to do if IxNework TCL Server is Down/Connection Failed ?

A: Currently there are 3 vsperf user accounts for IxNetwork in Ixia VM. Follow the below procedure to overcome the issue. Basically, all IxNetwork port numbers are pre-configured. You would just need to restart it.

1. Connect the Ixia VM (Remote Desktop) using 'vsperf_ci' login and password. Once its connected and VM is launched, system should automatically start IxNetwork service on TCL port 9126. Open the Hidden icon's arrow button in task bar and place the mouse pointer on the IxNetwork icon to see whether it shows the TCL Port Configuration. If it's not started automatically, then double click on the IxNetwork icon and it will start the service at port 9126.
2. Connect the Ixia VM (Remote Desktop) using 'vsperf_sandbox' login and password. Once its connected and VM is launched, system should automatically start IxNetwork service ion TCL port 9127. Open the Hidden icon's arrow button in task bar and place the mouse pointer on the IxNetwork icon to see whether it shows the TCL Port Configuration. If it's not started automatically, then double click on the IxNetwork icon and it will start the service at port 9127.

3. Connect the Ixia VM (Remote Desktop) using 'vsperf_sandbox2' login and password. Once its connected and VM is launched, system should automatically start IxNetwork service ion TCL port 9128. Open the Hidden icon's arrow button in task bar and place the mouse pointer on the IxNetwork icon to see whether it shows the TCL Port Configuration. If it’s not started automatically, then double click on the IxNetwork icon and it will start the service at port 9128.

If above three IxNetwork TCL services are running fine, then you are good to go.

Ideas

Configure 2nd jenkins slave for execution of VSPERF JOBs.

There are several nodes available at Intel-POD12 (see Intel POD12). Currently there are two sandboxes, where second sandbox using node1 and node2 was created recently. It would be possible to reconfigure 2nd sandbox to be used as another (or even two) jenkins slave. This would speed up execution of VSPERF Jobs. However releng team must be consulted regarding the proper naming as two different jenkins slaves will be hosted at the same Intel POD12.

Reconfigure VERIFY & MERGE jobs to utilize ericsson PODs more often.

In the past, VERIFY & MERGE jobs, were executed at openv-build-ubuntu groups of slaves, which consists of ericsson-build3 and ericsson-build4 machine. The execution was reliable at both of these servers for several months, but later it started to fail. There were several issues, some of them were related to hugepages allocations and usage and to VPP. In case of VPP, it happened several times, that it stopped to work at all at one of ericsson servers. Responsible admins were asked for help, but they were not able to find a root cause. The only solution was to reboot affected server and it worked for some time again. There is a suspicious, that both hugepages and VPP issues are caused by parallel execution of jobs for vsperf and other projects. As debugging of such race condition at server without any access is hardly possible, both VERIFY & MERGE jobs are primarily executed at Intel-POD12. Idea was to execute VERIFY & MERGE jobs at POD12 if it is not occupied by DAILY job and if so, then to move to ericsson POD. However current YAML file definition doesn't work that way. It switches to ericsson POD only in case that INTEL POD12 is offline. Releng engineers can help us with YAML file definition to achieve better utilization of available PODs.

Minimize impact of jenkins health check application

Consider pinning of jenkins health check application at second numa slot, which is not used for performance tests execution. Even better would be a move of that application to a jump host. However one had to solve, how to execute vsperf "remotly" and how configure multiple slaves at the same pod (probably not possible to run multiple heathchecks at the same machine - may be container would help).

This won't be needed if we will configure more jenkins slave at Intel POD12.