Progress Report of RDMA Performance in Multi-Tenant Virtualization Environment ­– VMs and Containers

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# Introduction

This project is focusing on the measurement study of RDMA performance in multi-tenant environment for VMs and Containers.

# Proposed Experiments

The proposed experimentation paths are as the following table. A series of 10 group of performance experiments are going to measure both the latency and bandwidth for transferring the same amount of data (say 1GB) in different settings.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Party A | | Party B | | | Protocol | Transfer |
| 1 | Host | 1 | Host | 1 | TCP | | single transfer and four transfers |
| 2 | Host | 1 | Host | 1 | RDMA | | single transfer and four transfers |
| 3 | VM | 1 | VM | 1 | TCP | | single transfer and four transfers |
| 4 | VM | 1 | VM | 1 | RDMA | | single transfer and four transfers |
| 5 | LXC | 1 | LXC | 1 | TCP | | single transfer and four transfers |
| 6 | LXC | 1 | LXC | 1 | RDMA | | single transfer and four transfers |
| 7 | VM | 4 | VM | 4 | TCP | | single transfer from 1 VM to 1 VM |
| 8 | VM | 4 | VM | 4 | RDMA | | single transfer from 1 VM to 1 VM |
| 9 | LXC | 4 | LXC | 4 | TCP | | single transfer from 1 container to 1 container |
| 10 | LXC | 4 | LXC | 4 | RDMA | | single transfer from 1 container to 1 container |
|  |  | | | | | | |

During the work, I have used different approaches/programs in evaluating the network performance, as follows.

* **qperf**qperf is a Linux utility to measure bandwidth and latency between two nodes [1]. It can work over TCP/IP as well as RDMA transports. Hence it is a convenient tool for performance testing in our experiments.
* **rdma\_cm server/client program**
* **MPI send/receive program in C**

# Experimental Systems

Macbook Air VirtualBox

ANU’s OpenStack

Two Acer Desktop Computers with InfiniBand Nanjing University

IBM OpenLab OpenStack Beijing

# Working Progress

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# Difficulties

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# Future Work (TODO List)

# References

1. qperf man page.

2.

# Appendix A