

INTEL XEON PHI WITH DELL EMC ISILON

Configuring the Intel Xeon Phi to NFS mount Isilon clustered NAS

ABSTRACT

This white paper explains how to configure the Intel® Xeon Phi™ to mount Dell EMC Isilon clustered NAS.

December, 2016

The information in this publication is provided “as is.” Dell Inc. makes no representations or warranties of any kind with respect to the information in this publication, and specifically disclaims implied warranties of merchantability or fitness for a particular purpose.

Use, copying, and distribution of any software described in this publication requires an applicable software license.

Copyright © 2016 Dell Inc. or its subsidiaries. All Rights Reserved. Dell, EMC, and other trademarks are trademarks of Dell Inc. or its subsidiaries. Other trademarks may be the property of their respective owners. Published in the USA 12/16 White Paper H15295.1

Dell EMC believes the information in this document is accurate as of its publication date. The information is subject to change without notice.

TABLE OF CONTENTS

ABSTRACT.....1

EXECUTIVE SUMMARY4

 AUDIENCE.....4

INTRODUCTION.....4

ENVIRONMENT.....4

HOST CONFIGURATION.....4

MPSS CONFIGURATION.....4

MOUNT THE ISILON.....5

CONCLUSION5

EXECUTIVE SUMMARY

This whitepaper presents the configuration for an Intel® Xeon Phi™ co-processor and a Dell EMC Isilon clustered NAS utilizing NFS. The intent is to provide a quick setup guide when using the two technologies together.

AUDIENCE

This white paper is intended for users of both Dell EMC Isilon clustered NAS and Intel Xeon Phi co-processors hosted on Intel Xeon platforms.

INTRODUCTION

The Intel® Xeon Phi™ co-processor from Intel offers the opportunity for users to access hundreds of compute cores for very cpu intensive tasks all in the space of a single card added to an Intel based server. This co-processor comes with a Linux based OS embedded with it along with enough RAM to store what's immediately required for most of the compute tasks sent to it. Normally, extra resources like disk and networking are added to the co-processor through the host. However, many hosts won't have enough disk space to be able to share a significant portion of it with a co-processor. Additionally, some compute tasks run by the Xeon Phi will require input data or an output area that isn't available from the host. For these reasons, it may be desirable to mount an Isilon NFS resource directly on the co-processor. This quick guide will address how to quickly accomplish that using a network interface bridged from the host to the Xeon Phi.

ENVIRONMENT

This guide was written with the following host configuration:

**Intel Xeon E5 (x2) w/64GB RAM running CentOS 6.6
2x1GbE and 2x10GbE Intel Ethernet interfaces
Xeon Phi Co-processor (Knights Corner)**

HOST CONFIGURATION

Before making any changes to the Xeon Phi co-processor running environment the host should be setup properly. The NetworkManager present on CentOS should be disabled due to it's ability to interfere with any manual interface configuration and it's inability to configure bridged interfaces.

```
service NetworkManager stop
chkconfig NetworkManager off
```

In addition, the default firewall functionality on the host should be disabled:

```
service iptables stop
```

This service can be re-enabled after setup is complete - however, firewall entries can be setup with the new ip addresses once the configuration process is complete. See the documentation for iptables for more information.

MPSS CONFIGURATION

The Xeon Phi MPSS (Many core Platform Software Stack) system can be configured with a bridged network interface so that from the co-processor OS, all external services can be accessed. All commands can be issued from the host environment. To begin first disable the MPS control service, halting the Phi:

```
service mpss stop
```

Then add a bridged interface accessible to the Xeon Phi on the host:

```
micctrl --addbridge=br0 --type=external --ip=192.168.9.247
```

Then add an ip interface to the Xeon Phi joined to the bridge interface just setup:

```
micctrl --network=static --bridge=br0 --ip=192.168.9.47
```

Add the host interface to be used with this setup to the bridge (in this case, eth5 - but any unused interface can be joined):

```
brctl addif br0 eth5
```

Enable spanning tree protocol (STP) for the bridge:

```
brctl stp br0 on
```

Restart the MPSS control service:

```
service mpss start
```

The Xeon Phi co-processor will now be able to access the network at 192.68.9.0/24 without any additional configuration.

MOUNT THE ISILON

The Isilon NFS mount can be accessed one of two ways. The first will make the /ifs share, using SmartConnect, from Isilon available to the Xeon Phi at /ifs. From the Xeon Phi (ssh into mic0):

```
mkdir /ifs  
mount -t nfs 192.168.9.100:/ifs /ifs
```

The second option will make the mount persistent across reboots by adding this mount to the startup configuration for MPSS:

(from the host)

```
micctrl --add-nfs=192.168.9.100:/ifs --dir=/ifs
```

Remember to reset the configuration for MPSS after this change:

(from the host)

```
service mpss stop  
micctrl --resetconfig  
service mpss start
```

CONCLUSION

Once an Isilon NFS share has been mounted on the Xeon Phi a number of possibilities are available. The Isilon can be used as a common binary repository for applications built for the Xeon Phi. It can act as a repository for input data and accept all of the output from applications running directly on the co-processor. Even when the Xeon Phi is at maximum throughput with the Isilon NFS clustered NAS, very little load is placed on the host and multiple Xeon Phi co-processors can be accommodated with this setup. Dell EMC looks forward to all deployments of the Xeon Phi with Isilon clustered NAS and is willing to assist customers of both platforms with any challenges they encounter.