

# IBM “Symphony Coprocessor Harvesting” Install Readme File

## About “Symphony Coprocessor Harvesting”

These packages contain the Symphony Coprocessor Harvesting feature. **Symphony Coprocessor Harvesting** is an add-on feature that allows Intel Xeon Phi devices to be used as resources in a Symphony cluster. Intel Xeon Phi is a PCIe-based parallel computing accelerator card which provides close to 1T flops of double precision FP computation and approximately 240 GB/s to 320 GB/s memory bandwidth with 6 to 8 GB local memory. The feature automates the detection and monitoring of Xeon Phi devices.

**Readme file for:** IBM® Platform Symphony

**Product/Component Release:** Symphony 6.1.1.0.219499

**Update Name:** Fix pack

**Fix ID:** sym-6.1.1-build229814

**Publication date:** 7 Feb 2014

**Last modified date:** 7 Feb 2014

1.Scope.....	3
2.Configuration to enable Symphony Coprocessor Harvesting.....	3
Prerequisites.....	3
Installation files.....	3
Installation procedure.....	4
Verification procedure.....	5
3.Usage.....	6
Case 1: Build sample applications using the installed SDK on a development host.....	6
Case 2: Run Symping sample on Xeon Phi cards.....	6
Case 3: Check entitlement audit.....	7
4.Note.....	7
5.Troubleshooting.....	7
1.After Xeon Phi compute hosts joined the cluster, the master lim cannot get the host information.....	7
2.The master cannot remotely control the Xeon Phi compute host.....	7
6.Copyright and trademark information.....	8

# 1. Scope

Applicability	
Operating system	RHEL 4/5/6 64 bit (linux2.6-glibc2.3-x86_64), K10M
Symphony version	Symphony 6.1.1
Cluster types	This feature applies to grid, compute, and SDK clusters
Dependencies	
File system	This feature has no requirements on the file system type
MPSS	This feature develops and tests based on MPSS version 3-2.1.6720-16 for RedHat 6.3. This feature does not limit for the mpss version 3-2.1.6720-16 for RedHat 6.3 to use.
Limitations	
Symphony Coprocessor Harvesting	<ol style="list-style-type: none"><li>1. Do not support Offload mode of Xeon Phi.</li><li>2. Do not support JAVA for SDK and compute package</li><li>3. Do not support MapReduce feature for compute node.</li></ol>

## 2. Configuration to enable Symphony Coprocessor Harvesting

### Prerequisites

You have already installed Symphony 6.1.1 Standard/Advanced edition.

You have already installed Intel MPSS (Intel Xeon Phi Software Development Environment).

### Installation files

File name	Description
symSetup6.1.1_inx26-lib23-x64.tar.gz	The package that contains this new feature. Install the package on the master host of the Symphony cluster.

File name	Description
symcomp6.1.1_xeon_phi.tar.gz	The compute package that contains this new feature. Install the package on hosts with Xeon Phi cards.
symSDK-linux2.6-k1om-6.1.1.tar.gz	The SDK package that contains this new feature. Install the package on Linux 64-bit hosts. This package is only used for building samples.
platform_sym_coprocessor_entitlement.dat	The entitlement file for Symphony Coprocessor Harvesting.

## Installation procedure

### a. Download Packages

- Navigate to IBM Fix Central at <http://www-933.ibm.com/support/fixcentral/swg/>.
- Enter the applicable Symphony product information.
- Click “Individual Fix IDs” and search for “sym-6.1.1-build229814”.

### b. Before installation

Shut down the cluster using the following commands:

```
[lsfadmin@mghost ~]$soamcontrol app disable all -f
[lsfadmin@mghost ~]$egosh service stop all
[lsfadmin@mghost ~]$egosh ego shutdown all
```

### c. Installation steps

#### 1. Installation procedure: Symphony production cluster

- Download "symSetup6.1.1\_lnx26-lib23-x64.tar.gz".
- (OPTIONAL) Back up SOAM binaries. Follow this step if you want to be able to roll back the change.
  - Go to \$EGO\_TOP/1.2.8/linux2.6-glibc2.3-x86\_64/etc directory and back up lim.
  - Go to \$EGO\_TOP/1.2.8/linux2.6-glibc2.3-x86\_64/bin/ directory and back up egoconfig.
  - Go to \$EGO\_CONFDIR directory and back up ego.shared.
- Copy symSetup6.1.1\_lnx26-lib23-x64.tar.gz to \$EGO\_TOP directory and de-compress the package.
- Edit \$EGO\_CONFDIR/ego.shared:
  - In the HostType section, add “k1om”.
  - In the HostModel section, add “XeonPhi 10.0 (x11\_2192\_0b01)”.
  - In the Resource section , add “xeonphi Boolean () () ()”.
- Download entitlement file platform\_sym\_coprocessor\_entitlement.dat to a location that is accessible from the master host.
- Update the entitlement configuration for the cluster:
  - egoconfig setentitlement *entitlement\_file*
- Start up the cluster:
  - egosh ego start all

- soamcontrol app enable *application\_name*
2. Installation procedure: Symphony compute package for Xeon Phi card.
    - Download "symcomp6.1.1\_xeon\_phi.tar.gz".
    - Copy the compute package symcomp6.1.1\_xeon\_phi.tar.gz to the compute host.
    - De-compress the symcomp6.1.1\_xeon\_phi.tar.gz file.
    - Set environments for CLUSTERADMIN, CLUSTERNAME, BASEPORT, and EGO\_TOP (EGO\_TOP is the directory where the compute package was de-compressed).
    - Configure the compute hosts
      - Make sure the busybox command is in the PATH environment variable.
      - sh config.sh
    - Source the environment for compute hosts:
      - . profile.platform (for bash)
      - source cshrc.platform (for csh)
    - Join the host to the cluster:
      - egoconfig join *master\_host*
    - Start the compute host:
      - egosh ego start.
    - Check the cluster resource status:
      - egosh resource list.
  3. Installation procedure: symSDK-linux2.6-k1om-6.1.1.tar.gz
    - Download "symSDK-linux2.6-k1om-6.1.1.tar.gz".
    - Copy the SDK package symSDK-linux2.6-k1om-6.1.1.tar.gz to the Linux 64-bit host.
    - De-compress the symSDK-linux2.6-k1om-6.1.1.tar.gz file.
    - Set environments for SOAM\_HOME (SOAM\_HOME is the directory where the SDK package was de-compressed).
    - Source the environment:
      - cd conf
      - . profile.soam (for bash)
      - source cshrc.soam (for csh)

#### d. Uninstalling

1. On master node:
  - Shut down the cluster using the following commands:
 

```
[lsfadmin@mghost ~]$soamcontrol app disable all -f
[lsfadmin@mghost ~]$egosh service stop all
[lsfadmin@mghost ~]$egosh ego shutdown
```
  - Restore the backup files.
2. On Xeon Phi compute node:
  - Shut down the compute node using the following commands:
 

```
[lsfadmin@mghost ~]$egosh ego shutdown
```
  - Delete the xeon phi compute files.

#### Verification procedure

1. Verify lim on the master host.
 

```
lim -V
Platform EGO 1.2.8.0 build 222953, Sep 29 2013
```

Copyright International Business Machines Corp, 1992-2013.  
US Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA  
ADP Schedule Contract with IBM Corp.

binary type: linux2.6-glibc2.3-x86\_64

2. Verify egoconfig on the master host.  
egoconfig -V  
Platform EGO 1.2.8.0 build 222953, Sep 29 2013  
Copyright International Business Machines Corp, 1992-2013.  
US Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA  
ADP Schedule Contract with IBM Corp.

binary type: linux2.6-glibc2.3-x86\_64

### 3. Usage

#### Case 1: Build sample applications using the installed SDK on a development host

##### Summary

Build sample applications using the installed SDK on a development host

##### Pre-conditions

1. Install symSDK-linux2.6-k1om-6.1.1.tar.gz package.
2. The compiler definitions are included in the following configuration files. You must edit the compiler locations in the corresponding configuration files:  
    \$SOAM\_HOME/6.1.1/Common.k1om.def # for Xeon Phi target  
    \$SOAM\_HOME/6.1.1/Common.x86\_64.def # for x86\_64 target
3. To build for Xeon Phi  
    cd \$SOAM\_HOME/6.1.1/samples/CPP/XeonPhiDemo  
    make clean  
    make k1om
4. To build for x86\_64  
    cd \$SOAM\_HOME/6.1.1/samples/CPP/XeonPhiDemo  
    make clean  
    make x86\_64

##### Post-conditions

1. The sample files included in the SDK should be compiled and linked without errors, either using the MPSS-included GCC cross-compiler or using the supported Intel compiler.

#### Case 2: Run Symping sample on Xeon Phi cards.

##### Summary

Run Symping sample on Xeon Phi cards.

##### Pre-conditions

1. Install Symphony 6.1.1 Standard/Advanced edition.
2. Install symSetup6.1.1\_inx26-lib23-x64.tar.gz on master host.
3. Install symcomp6.1.1\_xeon\_phi.tar.gz and start compute host.

4. Configure Xeon Phi cards as the resource group that Symping uses.
5. Run Symping.

#### Post-conditions

1. The tasks of the Symping sample run on the compute hosts where Xeon Phi cards are installed.

### **Case 3: Check entitlement audit**

#### Summary

Special entitlements are required to support Xeon Phi. Without installing Xeon Phi entitlement, Xeon Phi resources will not be able to join the master LIM.

#### Pre-conditions

1. Install Symphony 6.1.1 Standard/Advanced edition.
2. Install symSetup6.1.1\_inx26-lib23-x64.tar.gz on master host.
3. Install symcomp6.1.1\_xeon\_phi.tar.gz and start compute hosts.
4. Check \$EGO\_LOGDIR/ego.\$clustname.entitlement.acct.

#### Post-conditions

The master LIM will write the number of Xeon Phi cores to the audit file as follows every 24 hours, where the NCPUS excludes **NUM\_XEON\_PHI\_CORES**.

```
"1367829829 SYM_ADVANCED_EDITION 6.1.1 NCPUS k1om:  
NUM_XEON_PHI_CORES 0d87774cc61d7508965081228422c9bf1c9dfe7f"
```

## **4. Note**

Before running the samples in the SDK package, modify the application profile according to the platforms.

The Xeon Phi sample service and client binary is built on x86\_64 (64-bit) operation systems.

- To deploy the x86\_64 service, modify the service startCmd to \$ {SOAM\_DEPLOY\_DIR}/serviceName\_x64.
- To deploy the k1om service, modify the service startCmd to \$ {SOAM\_DEPLOY\_DIR}/serviceName\_k1om.

## **5. Troubleshooting**

1. After Xeon Phi compute hosts joined the cluster, the master lim cannot get the host information.
  - Make sure the MTU of the network interface on Intel MIC(Intel MIC Architecture) is the same as the host interface.
  - If the host has a domain name, make sure the Intel MIC can ping the short host name and full host name.
  - Remove "host" from the alias of the host in /etc/hosts on Host and Intel MIC.
2. The master cannot remotely control the Xeon Phi compute host.
  - Check whether the Intel MIC has the rsh command; if not, configure "EGO\_RSH=ssh" in \$EGO\_CONFDIR/ego.conf for both master and compute hosts. The master will then remotely control compute hosts by ssh.

## **6. Copyright and trademark information**

© Copyright IBM Corporation 2014

U.S. Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

IBM®, the IBM logo and ibm.com® are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at [www.ibm.com/legal/copytrade.shtml](http://www.ibm.com/legal/copytrade.shtml).