Intel® Cluster Ready 1.2
Intel® Server Board S5520UR
Platform* HPC 3.0.1
Red Hat* Enterprise Linux 6.1
Configuration C1 (Westmere)

APPENDIX

Version 1.0
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1. Sections executed for Platform* HPC 3.0.1

The Intel® Cluster Ready configuration script (icr_configure) is structured in sections; the following list shows the section execution flow for this recipe. Each section executes a unique set of configurations and/or checks.

1. ICRSanity
2. ICRSetup
3. ICREthernet
4. ICRIBConf
5. ICRUser
6. ICRCLCK

All these sections can be configured by either command line parameters or by editing the icr.ini file located at "/opt/intel/icr/etc/"

Manual flow execution, step by step execution

1) The following step is required before executing icr_configure.
```
source /opt/intel/icr/icrvars.sh
```

2) The Sanity Check section execution.
```
icr_configure --section=ICRSanity
```

3) The Intel® Cluster Ready Setup section execution
```
icr_configure --section=ICRSetup
```

4) The Ethernet configuration section execution
```
icr_configure --section=ICREthernet
```

5) The Infiniband configuration section execution
```
icr_configure --section=ICRIBConf
```

6) The User configuration section execution
```
icr_configure --section=ICRUser
```

7) The Intel® Cluster Checker configuration section execution.
```
icr_configure --section=ICRCLCK
```

Sanity Check

The ICRSanity section checks installed components and services required by the scripts to deploy an Intel® Cluster Ready compliant system. Also, the section sets up the required services configuration.

The ICRSanity section can be customized by setting new values at icr.ini file or by command line parameters.

 The file is located at /opt/intel/icr/etc/icr.ini

```
[ICRSanity]
COMPONENTS =
        nagios-monitored-node-v2_12
        ofed
        ofed-sm
        PCM-GUI
        ofed-sm
        base-installer
        hpc-libraries
        hpc-source-code
        nagios-monitoring-node-v2_12
        facilitator
        cluster-checker
        intel-runtime

SERVICES =
        nfs:onboot=yes:running=yes
        postgresql:onboot=yes:running=yes
        dhcpd:onboot=yes:running=yes
        xinetd:onboot=yes:running=yes
        httpd:onboot=yes:running=yes
        autofs:onboot=yes:running=yes
```

8) Execute the ICRSanity section:

```
source /opt/intel/icr/icrvars.sh
icr_configure --section=ICRSanity
```

ICR setup section

This section assigns and installs all components and packages needed by Platform* HPC 2.1 to comply with the Intel® Cluster Ready specification. Platform* HPC 2.1 provides an Intel® Cluster Ready component that is included in the Intel® Cluster Checker kit called facilitator. This component installs all the libraries that are required by the specification and that are not installed by default in the base Red Hat* installation. The facilitator component is enabled by this section but can also be manually enabled after installation by the user.

Additionally, the section configuration can be customized to install any other library or component desired by the user. For this purpose, specify the list of new components or packages in the ICRSetup section at icr.ini file.

To add a new component open the icr.ini configuration file and add a new variable:
        <node_group>-comp

Where <node_group> is the node group name were the new component should be installed.

For instance, if the icr.ini configuration file already has the following configuration:

```
installer-rhel-5.5-x86_64-COMPs =
        component-facilitator
        component-cluster-checker
```

```
      component-intel-runtime
```

And the user wants to add the component component-ofed-devel; then the following changes should be done

```
installer-rhel-5.5-x86_64-COMPs =
      component-facilitator
      component-cluster-checker
      component-intel-runtime
      component-ofed-devel
```

For adding new packages to the compute node use the same approach described above for components using the variable <node_group>-RPMs.

The configuration file is located at /opt/intel/icr/etc/icr.ini

Find below the configuration provided for the current recipe.

```
[ICRSetup]
installer-nodegroup = installer-rhel-5.5-x86_64

compute-rhel-5.5-x86_64-COMPs =
      component-facilitator
      component-intel-runtime

installer-rhel-5.5-x86_64-COMPs =
      component-facilitator
      component-cluster-checker
      component-intel-runtime
```

9) Execute the ICRSetup section for adding Inte® Cluster Ready required components to Platform® HPC installation.

```
source /opt/intel/icr/icrvars.sh
icr_configure --section=ICRSetup
```

Ethernet BKMs

The ICREthernet section configures some BKMs for Intel® PRO1000 Network driver.

The ICREthernet section can be customized by setting new values at icr.ini file.

 The file is located at /opt/intel/icr/etc/icr.ini

```
[ICREthernet]
DRIVERS = e1000,e1000e,igb
BKM_LIMITS_SCRIPT = icr_limits.sh
BKM_ETHERNET_SCRIPT = icr_ethernet.sh
```

10) Execute the ICREthernet section and use the icr.ini file:

```
source /opt/intel/icr/icrvars.sh
icr_configure --section=ICREthernet
```

Interconnect Support on the Frontend

The Infiniband* adapter and network must be configured on the Frontend.

The ICRIBConf section configures the ib0 interface, configures the network in HPC3.0.1 database and associates the new network to the installer and compute nodes.

Execute only the ICRIBConf section with a custom ip and netmask configured. If the ip and netmask addresses are not specified, the script will assign to ib0 the next subnet available from the provisioning network.

 The file is located at /opt/intel/icr/etc/icr.ini

```
[ICRIBConf]
IB0_IP = 192.168.24.11
IB0_NM = 255.255.255.0
BKM_OFED_SCRIPT = icr_ofed_conf-rocks.sh
SYSCTL_SCRIPT = icr_sysctl-rocks.sh
```

11) Execute ICRIBconf section

```
source /opt/intel/icr/icrvars.sh
icr_configure --section=ICRIBConf
```

User Configuration

The ICRUser section configures a Linux* user to have the configuration required by the Intel® Cluster Ready specification. The configuration script sets the user environment required for executing Intel® Cluster Checker.

The ICRUser section can be customized by setting new values at icr.ini file.

 The file is located at /opt/intel/icr/etc/icr.ini

```
 [ICRUser]
ICR_USERNAME = icr
```

12) Execute the ICRUser section and use the icr.ini file:

```
source /opt/intel/icr/icrvars.sh
icr_configure --section=ICRUser
```

Intel® Cluster Checker section Configuration

The ICRCLCK section configures and optionally executes Intel® Cluster Checker. The section configures the environment for Intel® Cluster Checker to run.

The ICRCLCK can be customized by setting new values at the icr.ini file.

 The file is located at /opt/intel/icr/etc/icr.ini

```
[ICRCLCK]
intel-clck-options = --deployment
intel-clck-logs-path = /var/log/intel/clck
intel-clck-path = /opt/intel/clck
intel-clck-conf-path = /etc/intel/clck
intel-clck-version = 1.8
intel-clck-binary = cluster-check
intel-nodelist = /etc/intel/clck/nodelist
intel-clck-config = S5520UR-ICR1.2-HPC3.0.1-RH6.1-C1-v1.0-config.xml
intel-clck-head-list = ICR1.2-HPC3.0.1-RH6.1-C1-v1.0-head.list
intel-clck-compute-list = ICR1.2-HPC3.0.1-RH6.1-C1-v1.0-compute-
node.list
```

To enable the Intel® Cluster Checker automatic execution add the option execute-intel-clck in the
icr.ini configuration file:
execute-intel-clck=True

13) Execute the ICRCLCK section and use the icr.ini file:
```
source /opt/intel/icr/icrvars.sh
icr_configure --section=ICRCLCK
```

2. Install the Intel® Cluster Runtimes package (Manually)

The following procedure explains how to install the Intel® Cluster Runtimes when it is not provided by provisioning system packages

14) Untar the Intel® Cluster Runtimes package and install it. Note: During the procedure you should accept the EULA in order to proceed.

```
tar -xzf /root/intel_cluster_runtimes_3.2-1.tar.gz -C /shared
cd /shared/intel_cluster_runtimes_3.2-1
yum install -y compat-libstdc++-33
./install.sh
```

Once all the nodes were deployed, the Intel® Cluster Runtimes package must be installed on each node. Execute the commands listed below.

```
chmod 755 -R /shared/intel_cluster_runtimes_3.2-1/
pdsh -a 'rpm -ivh /shared/intel_cluster_runtimes_3.2-1/rpm/*i486.rpm'
pdsh -a 'rpm -ivh /shared/intel_cluster_runtimes_3.2-1/rpm/*.noarch.rpm'
pdsh -a 'rpm -ivh /shared/intel_cluster_runtimes_3.2-1/rpm/*x86_64.rpm'
```

3. Install the Intel® Cluster Checker tool (Manually)

The following procedure explains how to install the Intel® Cluster Checker when it is not provided by provisioning system packages.

15) Place the Intel® Cluster Checker tool license file:

```
cp /root/*.lic /opt/intel/licenses
chmod a+r /opt/intel/licenses/*.lic
```

16) Untar the Intel® Cluster Checker package and executed the following command as root. Then follow the instructions.

```
tar -xzf /root/l_clck_p_1.8.004.tgz -C /tmp
/tmp/l_clck_p_1.8.004/install.sh
```

4. The Recipe Folder Structure

After the recipe package was uncompressed and installed, the following folder structure is generated. The folders that are created are:

- A root folder
- A documentation folder
- A configuration folder
- A library folder
- A system command folder

The root ICR (Intel® Cluster Ready) Reference Folder
The folder contains all the files used by the Intel® Cluster Ready Reference package.
```
/opt/intel/icr/
|-- icrvars.sh
|-- doc
|-- etc
|-- lib
`-- sbin
```

The Document ICR (Intel® Cluster Ready) Folder
It contains the documentation related with the Reference design (Reference design document plus Release note). The folder structure is:
```
/opt/intel/icr/
|-- doc
|    |-- Intel_Cluster_Ready_Reference_Recipe_S5520UR-ICR1.2-HPC3.0.1-
RH6.1-C1-v1.0.pdf
|    |-- Intel_Cluster_Ready_Reference_Recipe_S5520UR-ICR1.2-HPC3.0.1-
RH6.1-C1-v1.0-appendix.pdf
|    `-- S5520UR-ICR1.2-HPC3.0.1-RH6.1-C1-v1.0-release-notes.html
```

The Configuration ICR (Intel® Cluster Ready) Reference Folder
It contains the configuration files use by the Reference design (the Intel® Cluster Checker files plus Reference ini file). The folder structure is:
```
/opt/intel/icr/
|-- etc
|    |-- ICR1.2-HPC3.0.1-RH6.1-C1-v1.0-compute-node.list
|    |-- ICR1.2-HPC3.0.1-RH6.1-C1-v1.0-head.list
|    |-- S5520UR-ICR1.2-HPC3.0.1-RH6.1-C1-v1.0.xml
|    `-- icr.ini
```

The library ICR (Intel® Cluster Ready) Reference Folder
It contains all sections and common python scripts used by the Reference Design, all these files are executed by the icr_configure script located at the sbin folder. The folder structure is:
```
/opt/intel/icr/
|-- lib
|    `-- python
|        |-- common
|        |    |-- __init__.py
|        |    |-- …
|        |    |-- configrecipe.py
```

```
|        `-- sections
|            |-- __init__.py
|            |-- bash_scripts
|            |-- icr_clck.py
|            |-- …
|            |-- icr_user.py
```

The system binary ICR (Intel® Cluster Ready) Reference Folder

It contains the icr install engine used by the Reference design, the folder structure is:

```
/opt/intel/icr/
`-- sbin
    `-- icr_configure
```