



How to Certify Your Cluster with Intel® Cluster Checker v2

The goal of Intel® Cluster Ready certification is to verify that your cluster solutions comply with the Intel® Cluster Ready Architecture Specification making them interoperable with compliant applications. This document describes the specific steps, that are required to certify a cluster. Additional information may be found in the *Intel® Cluster Ready Architecture Specification* and the *Intel® Cluster Checker User's Guide*. If you are building a cluster using a reference design that has already been certified, you may not need to recertify it—see the program document *Certification Quick-Start Guide* for more details.



By joining the Intel® Cluster Ready Program, your company already has obtained the Intel® Cluster Checker tool and a valid license. Be sure you have the current version—you must have Intel® Cluster Checker version 2.1 or later to use the procedures described here. Also, this document assumes you have developed a new cluster reference design and built a cluster based on that design. You are now ready to perform the required Intel® Cluster Checker certification run on that cluster to verify that the reference design is Intel® Cluster Ready-compliant.

The run will produce an output file. This file and a bill of materials (BOM) for your cluster must be included in the certification submission. Microsoft® Word®, Microsoft® Excel®, or plain ASCII text are the preferred formats for BOMs.

Here are the basic steps to certify your new cluster reference design:

1. Review the Cluster BOM

Each Intel® Cluster Ready reference design has a specific hardware and software BOM that is defined by your design engineering team. Table 1 shows an example of the hardware components of a BOM, and Table 2 shows the software components.

Before you begin your certification run, obtain the BOM for the particular cluster you will be testing. The test cluster should conform to the BOM, and the BOM will determine some of the Intel® Cluster Checker settings for the certification run. When your company sells future clusters based on this reference design, some variances from the original BOM hardware will be allowed. For example, the customer may order more memory, faster local storage devices, i.e. HDDs or SSDs, or a different number of nodes (see the program document, *Mass-Producing Your Certified Cluster Solutions*, for details). However, the software will need to match each new cluster and will be verified by Intel® Cluster Checker.



Table 1. Bill Of Materials example, hardware components

Quantity	Item	Manufacturer	Model
33	Intel® Server System	Intel	R2308GZ4GC
66	Intel® Xeon® Processors	Intel	Intel Xeon Processor E5-2680
264	8GB DDR3 PC3-1600	Micron*	MT18KSF1G72PZ-1G6
38	120GB SATA Solid State Drive 520 Series	Intel	SSDSC2Cw120A310
64	Intel® Xeon Phi™ coprocessors	Intel	5110P
33	Intel® True Scale Fabric Host Adapter	Intel	QLE7340-CK
1	SATA Slim-line Optical DVD Drive	Intel	AXXSATADVDR0M
1	Intel® True Scale Fabric Switch	Intel	12200
1	Gigabit Ethernet switch	HP*	ProCurve V1810-48G

Table 2. Bill Of Materials example, software components

Distributed By	Description	Contact Information
Intel® Corporation	Reference Design Package The following files are included: <ul style="list-style-type: none"> ▪ The Intel® Cluster Checker files (config, head and node list) ▪ The Reference Design Scripts ▪ The Intel® Cluster Ready Certificate ▪ The Intel® Cluster Ready Reference Implementation Release Notes 	http://www.intel.com/go/cluster
Intel® Corporation	Intel® Cluster Studio XE 2013	http://software.intel.com/en-us/intel-cluster-studio-xe/
Intel® Corporation	Intel® Cluster Checker 2.1	http://www.intel.com/go/cluster
CentOS	CentOS* Linux* Operating System 6.4	http://www.centos.org
Intel® Corporation	Intel® Cluster Runtimes 3.5	http://www.intel.com/go/cluster

2. Configure Specific Tests for Your Cluster

Next, generate the Intel® Cluster Checker XML configuration file to define your cluster configuration (as detailed in the *Intel® Cluster Checker User's Guide*). Also, it is highly recommended that you save the Intel® Cluster Checker XML configuration at `/etc/intel/clck/config.xml`. An important part of this process is defining appropriate performance thresholds for the cluster you are testing, based on the BOM. Although this task is optional, Intel highly encourages you to set thresholds for all performance-related test modules.

It is also important to configure Intel® Cluster Checker to verify all of the message fabrics in your cluster. Both the DAPL and the main TCP/IP interfaces of all the message fabrics must be included if both are installed. For example, if you are certifying a cluster with both Ethernet and InfiniBand* fabrics, you need to configure Intel® Cluster Checker to test both.

Add any other checks appropriate for your specific cluster. You can use the `<include_ module>` tag in the configuration file to include optional Intel® Cluster Checker test modules. Intel recommends that you use the XML schema provided with Intel® Cluster Checker to validate your configuration file with third-party tools such as `xmllint`.

3. Run Intel Cluster Checker as a Regular User

Once you have generated the Intel® Cluster Checker XML configuration file, you are ready to run the tool. Use the Intel® Cluster Checker command-line interface and start this run with the following command:

```
clck --config=<xmlfile> \  
--nodefile=<nodefile> --certification
```

As part of this run, Intel® Cluster Checker will verify the capabilities of your message fabric or fabrics. Be sure you have configured Intel® Cluster Checker to verify all of the message fabrics in your cluster as described in Step 2.

After the run, save the output so that you can send it to Intel. The run should have completed successfully to obtain certification, but specific exceptions are permitted. For example, the `<library>` test module fails for one of the following reasons, then your compliance run may still be accepted. However, Intel strongly encourages you to use the exclusion options for these tests, to allow these tests to pass. Refer to the *Intel® Cluster Checker Module Reference Guide* for more information on adding exclusions for these modules.

<libraries> test module exceptions

A 32-bit library is allowed to be present without a 64-bit counterpart if:

- The 32-bit and 64-bit libraries are both present but have different names—for example, `libA.so` and `libA-x86_64.so`.
- The 32-bit library has a corresponding 64-bit library, but, does not correspond to the same version. The 64-bit version must be more recent—for example, `libB.so.1` (32-bit) and `libB.so.2` (64-bit).

If the tests fail for reasons other than these exceptions, or other tests in this run fail, you must resolve the reported issues or your run cannot be accepted. Sometimes, you may have to perform multiple iterations of debugging and retesting-making changes to the cluster itself or to the file describing the cluster configuration-to resolve all issues. After completing the run successfully, save the output file so you can send it to Intel later. The output file is located in the `/var/log/intel/clck` folder and has a

filename in the format `clck-<date>-<time>.log`

4. Submit Results for Certification

You should now have a text output file for the Intel® Cluster Checker run, plus the BOM (in Microsoft* Word*, Excel*, or ASCII text format) for your cluster, ready to submit for certification. To make the submission, complete the form below and use the “Submit by E-mail” button to open an e-mail to cluster@intel.com. Before sending, attach the `clck-<date>-<time>.log` file mentioned above and your cluster BOM to the e-mail.

Once you receive certification for this reference design, you can use the design to mass-produce certified clusters for sale to your customers. In fact, you can sell several different types of clusters from this reference design by varying the hardware while maintaining the same software stack. Learn how to leverage your reference design engineering investment—see the program document, *Mass-Producing Your Certified Cluster Solutions*, for details.

Interactive Submission Form

Please check the following:

I have read and understood the Intel® Cluster Ready specification. By checking this box, I certify that my cluster recipe meets all of the requirements contained in the specification, including the following requirements:

- Fully automated node provisioning, including adding and removing nodes
- All non-Ethernet network fabrics configured to enable both TCP/IP and DAPL interfaces
- Remote console
- Adherence to all primary, referenced standards (POSIX*, for example)

Company name: _____

Cluster system product name: _____

The identifier should be the one used by your customers.
It should not be an internal codename unless no other identifier exists.

Number of nodes certified: _____

If necessary, please distinguish between types of nodes
(for example, compute, service, and so on).

Contact information:

Name : _____

Phone : _____

Title : _____

Address : _____

E-mail : _____

This individual will receive the Intel® Cluster Ready compliance certificate by e-mail. This individual will also be contacted if there are any questions regarding the submission.

[Submit by E-mail](#)

¹You must either supply the full path when invoking Intel Cluster Checker or use the environment setup script included with the tool.

This individual will receive the Intel® Cluster Ready compliance certificate by email. This individual will also be contacted if there are any questions regarding the submission.

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