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Intel(R) Cluster Checker 2019 Update 4.0 for Linux* - Release Notes
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1. OVERVIEW
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Intel(R) Cluster Checker verifies the configuration and performance of
Linux*-based clusters and checks the cluster's compliance with the
Intel(R) Scalable System Framework (Intel(R) SSF).

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1.1. RELATED PRODUCTS AND SERVICES
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Information about Intel(R) software development products is available at
http://www.intel.com/software/products.

These are some of the products related to Intel(R) Cluster Checker:

o Intel(R) SSF is an architectural design foundation that enables development
  and deployment of a wide variety of high-performance, balanced solutions to
  support compute- and data-intensive workloads. Its standards-based
  programmability allows engineers to run diverse workloads on a broadly
  available, common infrastructure, making the power of high-performance
  computing accessible to businesses of all sizes.

  http://www.intel.com/ssf

o The Intel(R) C++ and Fortran Compilers include advanced optimization
  and multithreading capabilities, highly optimized performance
  libraries, and analysis tools for creating fast reliable
  multithreaded applications.

  http://www.intel.com/software/products/compilers

o The Intel(R) MPI Library for Linux*, the Intel(R) Trace Analyzer and
  Collector for Linux*, and the Intel(R) Math Kernel Library Cluster
  Edition for Linux* are the most awarded development tools. They
  create, analyze, and optimize high-performance applications on
  clusters of Intel(R) processor-based systems.

  http://www.intel.com/software/products

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2.  NEW FEATURES
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2.1 WHAT'S NEW IN VERSION 2019 Update 4.0
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- Enhanced functionality for testing memory uniformity.
- Added flexibility on checks for memlock limits to InfiniBand and Intel(R)
  Omni-Path Architecture (Intel(R) OPA) checks.
- Improved support for diskless clusters.
- Improved messages and bug fixes.


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2.2 OLDER VERSIONS
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2.2.1 Version 2019 Update 3.5
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- Added support for checking of second-generation Intel(R) Xeon(R) Scalable
  Processors by privileged or non-privileged users.
- Updated support for validation of Intel(R) Select Solutions for Simulation
  and Modeling to include the second-generation Intel(R) Xeon(R) Scalable
  Processor solution.
- Added support for checking Intel(R) Optane(TM) DC Persistent Memory
  configurations and uniformity.
- Included support for second-generation Intel(R) Xeon(R) Scalable Processor
  with the Intel HPC Platform Specification.
- Added checking for the Intel(R) Parallel Studio XE 2019.0 runtimes.


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2.2.2 Version 2019 Update 2.1
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- Updated support for validation of Intel(R) Select Solutions for Simulation
  and Modeling.
- Added in support for Intel HPC Platform Specification 2018.0.
- Intel(R) Cluster Checker 2019 Update 2.1 includes functional and security
  updates. Users should update to the latest version.


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2.2.3 Version 2019 Update 2
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- Intel(R) Cluster Checker 2019 Update 2 includes functional and security
  updates. Users should update to the latest version.


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2.2.4 Version 2019 Gold
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- New 'clck' command simplifies execution with a single command.
- Added improved output messaging:
   - New compact summary output provided on screen.
   - Details of analysis provided in the output logfile.
   - Simplified scheme to assess issues as 'CRITICAL', 'WARNING', or
     'INFORMATIONAL'
   - Added -R option for specifying where results are written.
   - Changed -o option to specify where log output is written.
- Added performance threshold checking for Intel(R) Xeon Phi(TM) Processor
  x205 Product Family.
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- Added -X command line option, allowing a user to obtain a list of available framework definitions and their respective descriptions on data collected and analysis tests.
- Added the ability to mark two snapshots of a cluster state to identify changes. Currently supported with the following framework definitions: rpm_snapshot, hardware_snapshot, files_snapshot.
- Added a user option to collect any missing or old data before analysis.
- Added ability to collect data on a cluster that does not have pdsh if the Intel(R) MPI Library is installed.
- Added the ability to collect data without specifying a node file if nodes are allocated through SLURM.
- Added in support for validation of Intel(R) Select Solutions for Simulation and Modeling.
- New Intel(R) Cluster Checker API.

2.2.5 Version 2018 Update 3

- Resolved an issue with running lshw without privileged access.

2.2.6 Version 2018 Update 2

- Added support for Intel(R) Select Solutions Framework Definitions.

2.2.7 Version 2018 Update 1

- Enabled provider configuration as part of Framework Definitions.
- Enabled latest Intel(R) Xeon(R) processors.
- Renamed predefined Framework Definition names to be more informative.
- Added support for the SGEMM benchmark.
- Improved memory checking.
- Enhanced user visible message output.
- Added checks for Intel(R) Omni-Path Fabric subnets.
- Bug fixes.

2.2.8 Version 2018

- Added support for Intel(R) Xeon(R) Scalable processors.
- Added Framework Definition feature to allow for customization of analysis.
- Added support for Intel(R) Turbo Boost Technology validation.
- Added support for analysis from multiple database sources.
- Updated samples and SDK.
- Converted documentation to online format.
- Enhanced Intel(R) Omni-Path Architecture validation.
- Added OpenFabrics Interfaces support.
- Enhanced user viewable message output.
- Bug fixes

2.2.9 Version 2017 Update 2

- Improved support for Intel(R) Xeon Phi(TM) Product Family x200 processors.
- Improved support for Intel(R) Omni-Path Architecture.
- Bug fixes.

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2.2.10 Version 2017 Update 1
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- Added Intel(R) Scalable System Framework Support.
- Deprecated support for Intel(R) Cluster Ready.
- Added additional support for Intel(R) Xeon Phi(TM) Product Family x200
  processors.
- Removed heartbeat functionality.
- Bug fixes.

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2.2.11 Version 2017
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- Added support for Intel(R) Xeon Phi(TM) Product Family x200 processors.
- Added support for the Lustre* file system.
- Significantly improved analysis performance for large databases.
- Extended the API to provide the ability to collect data.
- The separate analyzer (clck.xml) and data collection (clckd.xml)
  configuration files were merged into a single file (clck.xml). Previous
  configuration files are not compatible.
- Allows more granular suppressions. See the section on suppressions
  in the User's Guide for more information.
- The asynchronous data collection daemons, clckd and clck-serverd, have been
  replaced by a plugin to the Open Resilient Cluster Manager* (ORCM). See
  orcm/README for more information. The ORCM plugin is a technical preview
  feature; please see the Known Limitation section for its current limitations.
- Databases from previous versions of the product are incompatible with version
  2017 due to database schema changes.
- The samples have been moved online and are no longer distributed as part of
  the product. They are now available at the URL below:
  https://software.intel.com/en-us/product-code-samples?topic=20903

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3.  SYSTEM REQUIREMENTS
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The following sections describe hardware and software requirements.

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3.1.  HARDWARE
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    - Intel(R) Xeon(R) processor (Intel(R) 64 architecture)
    - 1 GB of RAM recommended
    - 160 MB of free hard disk space required for installation

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3.2.  SOFTWARE
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Operating Systems:
    - CentOS 6 and 7
    - Red Hat* Enterprise Linux* 6 and 7
    - SUSE* Linux* Enterprise Server 11 and 12
    - Ubuntu* 14.04, 16.04, and 17.04 (See Section 6 for known issues)

Runtimes:
    - Intel(R) MPI Library

    Note: While the full SDK versions of these components fulfill the
    requirement, only the runtime library is required.

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4. INSTALLATION NOTES

Intel(R) Cluster Checker is distributed as a standalone package.

To install package, run the following commands:

    % tar -xzf l_clck_p_2019.2.<package#>.tgz -C /tmp
    % cd /tmp/l_clck_p_2019.2.<package#>
    % ./install.sh

Notes:
    - The default Intel(R) Cluster Checker install path is
      /opt/intel/clck/2019.2.<package#>.

    - Intel(R) Cluster Checker needs to be installed on all nodes.
      This can either be accomplished either by installing into a
      shared directory or by installing a local copy on each node.
      Both options are supported by the installer.

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5. DOCUMENTATION

This release of Intel(R) Cluster Checker includes the following
documentation:

The Getting Started Guide walks through using Intel(R) Cluster Checker
for the first time.

The Intel(R) Cluster Checker User's Guide contains information about how to
use, configure, and extend Intel(R) Cluster Checker. The User's Guide describes
the basic usage models, contains information about specific configuration
options, explains how to embed Intel(R) Cluster Checker functionality into
other applications, shows how to add new checks to the tool, and demonstrates
how to modify existing checks.

The Intel(R) Cluster Checker API reference describes the API that may
be used to embed Intel(R) Cluster Checker functionality into other
software programs.

The documentation can be found at:
https://software.intel.com/en-us/intel-cluster-checker-support/documentation.

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6.   KNOWN LIMITATIONS AND TROUBLESHOOTING
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The following is a list of known issues in this release.

- Executing Intel(R) Cluster Checker framework definitions which run
  cluster-wide checks, when configured to use the Intel(R) MPI collect
  extension, may fail with Intel(R) MPI Library 2019 Update 3. Please use
  Intel(R) MPI Library 2019 Update 4 (or Update 2 or 1) instead.

- On SLES systems, an error will occur regarding libcrypto linking. In order to
  circumvent the error, please create a symlink to the available libcrypto
  library in your system using the following command:
  'ln -s /usr/lib64/libcrypto.so
/opt/intel/clck/2019.3.5/lib/intel64/libcrypto.so.10'

- Data collection behavior and functionality

    o If the temporary directory used during collection is located on a shared
      file system, the directory will not be deleted.

    o The ORCM plugin is a technical preview feature.

    o Databases located on NFS file systems mounted with the "nolock"
      option are not supported. Not all data from concurrent data
      collection instances per database will be written to the
      database and the database may become corrupted. A single data
      collector instance per database can usually be used successfully
      in this case.

    o The error "Error: disk I/O error" may be generated when accessing a
      database located on a Lustre file system. The Lustre file system must
      be mounted with the "-o flock" option.

    o The 'iozone' data provider does not execute correctly on
      diskless clusters.

    o If collecting data as root, the value of the
      CLCK_SHARED_TEMP_DIR environment variable must be set to the
      fully-qualified path of a directory accessible on all nodes.

    o When collecting data on Ubuntu*, if the installed "which" command does
      not support --skip-functions and --skip-alias, a few providers will need
      additional configuration and a few providers will not run successfully.
      The following providers must be configured for the specification of
      absolute binary location:
      - cpuid
      - cpupower
      - dmesg
      - ibstat
      - lscpu
      - numactl
      - opahfirev
      - opasmaquery
     Refer to Intel(R) Cluster Checker User Manual, Chapter 6 for details about
     specifying absolute binary paths for the above mentioned providers.

In addition, there are limitations to validating
        Intel(R) SSF compliance when running on Ubuntu.
        It is not recommended to use Intel(R) Cluster Checker for Intel(R) SSF
        compliance when running on Ubuntu.

- Analysis behavior and functionality

        o Clusters containing dual port InfiniBand* adapters where the
          second port is unused should suppress the
          'infiniband-port-physical-state-not-linkup' and
          'infiniband-port-state-not-active' signs. See Chapter 4 of the
          User's Guide for more information on how to suppress signs.

        o When using the Linux* boot parameter isolcpus with an Intel(R) Xeon
          Phi(TM) processor using default MPI settings, MPI based applications may
          fail. If possible, change or remove the isolcpus Linux* boot parameter.
          If this is not possible and you are using the Intel(R) MPI Library, you
          can try setting I_MPI_PIN to off. Refer to the Intel(R) Cluster Checker
          reference manual for details on specifying environment variables for
          tests.

        o When run with dgemm/dgemm_cpu_performance or
          stream/stream_memory_bandwidth_performance framework, "stream-outlier" or
          "dgemm-data-is-substandard" may be observed as the corresponding provider
          scripts may not yield the expected performance with SNC-2/SNC-4 cluster
          mode and Flat memory mode configurations for Intel(R) Xeon Phi(TM)
          processor. There may be an issue with the kernel itself (BZ#1479763),
          documented at https://access.redhat.com/errata/RHBA-2017:2581
          If there are no corresponding diagnoses, the signs may be suppressed.

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7. TECHNICAL SUPPORT

If you did not register Intel(R) Cluster Checker during installation, please do
so at the Intel(R) Software Development Products Registration Center at
http://registrationcenter.intel.com. Registration entitles you to free
technical support, product updates and upgrades for the duration of the support
term.

For information about how to find Technical Support, Product Updates, User
Forums, FAQs, tips and tricks, and other support information, please visit:
http://www.intel.com/software/products/support/

Note: If your distributor provides technical support for this product, please
contact them for support rather than Intel.

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